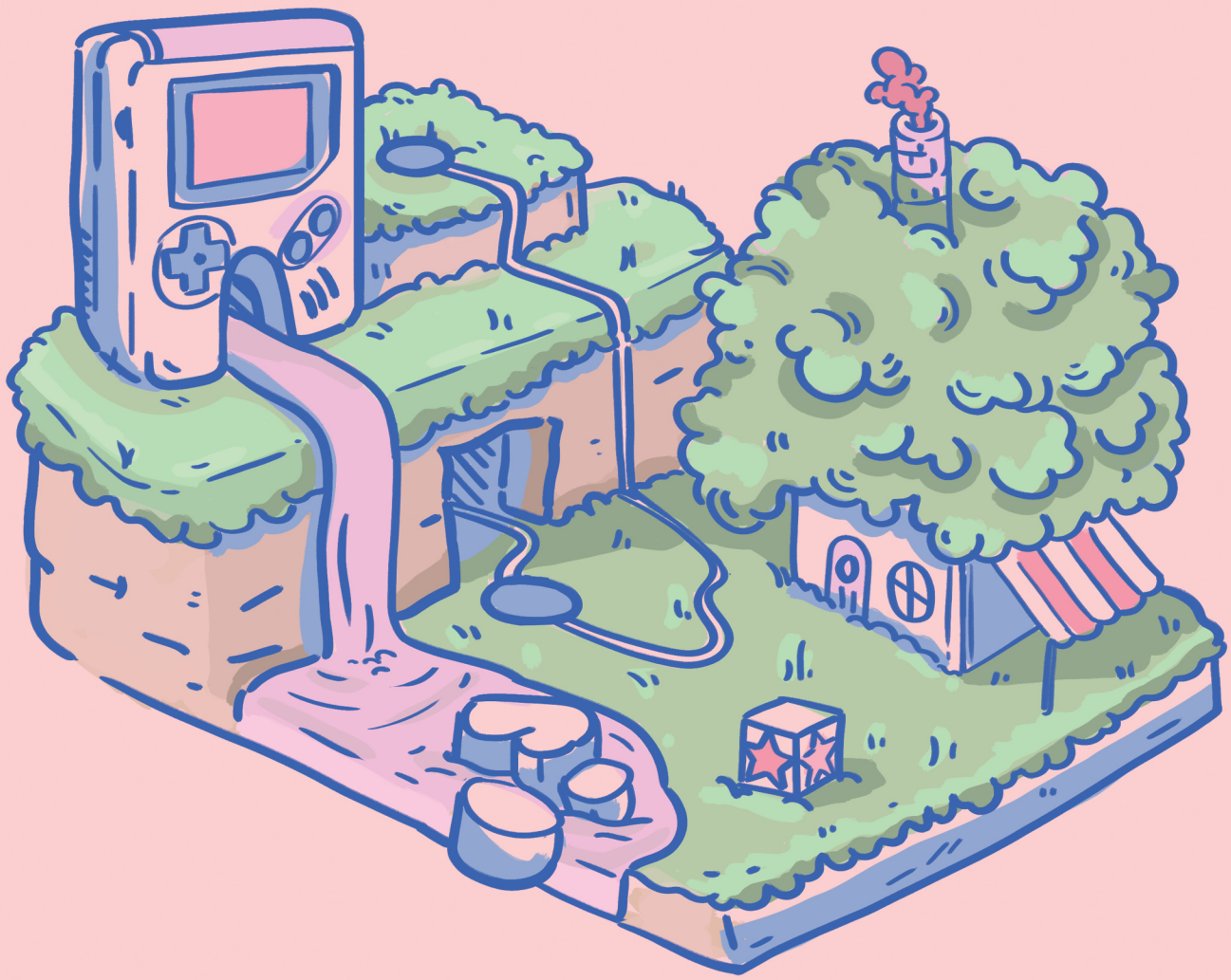
WHAT HAPPENS WHEN WE PLAY

A Critical Approach to Games User Experience Design & Education

Edited by
Rebecca Rouse, Björn Berg Marklund,
& Anna-Sofia Alklind Taylor



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Unboxing Games Education

Evan Barba

1. Virtual Proving Grounds

There are many reasons to believe that we might find ourselves spending more time in virtual and extended realities (XR). Obviously, the Covid-19 pandemic forced many of us to move our work, school, and socializing onto video conferencing platforms, kickstarting a major paradigm shift that was already well-underway. Those changes appear poised to remain in place, as many of us with the luxury to choose are opting to keep virtual work in some form. This is only the tip of the iceberg, however, as our changing climate continues to melt actual icebergs, those not forced to migrate will find travel too inconvenient, too expensive, too dangerous, or too unethical. It certainly seems that, in the not-too-distant future, the best or only way to experience the world outside our narrow slice may well be in an increasingly realistic and idealized virtual reality delivered at a fraction of the carbon cost of the real thing. The executives at Meta and other technology companies are already positioning themselves to provide us with the opportunity to immerse ourselves in elaborate virtual worlds that uncannily resemble the real one remember, or, perhaps, magically create unreal ones we could previously only imagine. Both of these will, naturally, be inhabited by the avatars of our friends and family alongside those of new strangers we have yet to meet. The experiences of these virtual realities will go far beyond the clunky exergames of today and the familiar shared worlds of multiplayer games to bring us experiences that

will, at the same time, help us escape the degradation of our physical reality while also becoming an integral part of it. Who will build these experiences and what will they need to know to do so?

I've seen a glimpse into the future of XR experiences. For sure, there are plenty of games to be played there, from functionally focused exergames that measure biometrics for optimal fitness, to experimental 'alternate-reality games' that are intended to challenge our notions of fundamental concepts like cause-and-effect or 'friendship' and many variations in-between. There are common elements to all these experiences, as they all share the same basic XR platforms platforms and rely rely on the same sets of commonly taught toolchains and asset pipelines. Jumping from one genre to another however, requires some flexibility of thought and an adaptability that are difficult things to teach or to learn. The fact that these different experiences in this emerging medium share so much in common in the tools and methods of their creation while having such distinct and disparate aims has led me to consider more deeply what it will take for a future generation of learners and instructors to create the next generation of experiences.

My most recent work in 'scenario design' creating realistic deescalation training scenarios for law enforcement has required me to engage with the same multi-disciplinary design teams whose training and interest has traditionally been to create games, but with the new challenge of creating scenarios that explicitly cannot feel like games. This is, in fact, no easy task, as it requires that experience-makers actively re-configure both the expectations of users as well as their own intuition. The popular association between XR technology and immersive games has created something of an expectation in users that when one enters a virtual world, there will be all manner of fun and clever puzzles to solve, impossible feats to perform, fantastic worlds to explore, and plenty of magical power-ups. Countering this expectation to create believable scenarios where users react with authentic emotions and behave naturally is a different design challenge from mainstream game design and one that is surprisingly difficult. The separate, but related, questions about what this paradigm shift means for the creators and designers has been no less complicated.

It's not my purpose here to dive deeply into the nuances of what makes

creating these scenarios different from games. They are distinct design problems with many constraints that simply do not appear in game-design, such as the requirement that the training actually result in better law enforcement. However, what this research has shown me is that there are many skills that one can learn through the creation of game experiences that are not only applicable in scenario design, but essential to it. There are the obvious technical ones, like character modeling and performance capture and the conceptual ones like narrative branching and logical reasoning, but there are also the 'softer' ones that are difficult to name, but have very real importance. Being able to conduct a user test and see where the user is becoming confused or reacting unexpectedly is an essential intuition that can be built up through playtesting but takes on new relevance in the context of training scenarios that can literally have life and death consequences. The contradiction in this work is that the required expertise is born specifically through designing and making games while also adamantly not at all related to game design. It's my observation of these transferable skills and their importance that has led me to think more deeply about what can be taught and learned through the process of game-making that has real value and application outside of making games. It's not my intention to be exhaustive in listing and discussing these skills, but rather to call attention to a few key areas and categories that might help move the discussion on 'transferable game design skills' forward.

2. Interdisciplinary Thinking

Games are an interdisciplinary endeavor. Regardless of whether one is designing them or analyzing them, they require that we adopt multiple perspectives, combine distinct and overlapping skill sets, and think holistically about what it all means when the different parts come together. But, games are not only the object of interdisciplinary thought and action, they are also the incubator of that thought and action. What we learn when we make games with our collaborators are the essential building blocks of collaboration in any field. This includes the so-called 'soft skills' of communication, teambuilding, and meeting deadlines, for example; as well the 'hard skills' needed to solve many technical or design challenges (analyzing data, testing and iteration, etc.). We tend to think of games as the final product of interdisciplinary teams coming together, with each team member adding their own unique contribu-

tion; yet, they are also the context where we learn to be a part of a culture of collaboration and are exposed to new ways of thinking and doing. In this sense, games are where we learn to be interdisciplinary.

When we learn about games in the classroom, they need to be analyzed as research objects. Often, they are deconstructed and contextualized as media artifacts so we can discuss their meaning and understand how they achieve their ends, or held up as examples of technical accomplishment. But, each one of those same games is also an end-unto-itself, produced through a unique sociotechnical design process. This makes it also the subject of interdisciplinary thought and action, and this is where I'd like to focus some attention, because the details and subtleties of this process have much to teach us despite the fact that we rarely discuss the details openly. Game-making is the context where we are exposed to new disciplinary perspectives that give us new experiences to draw on and new ideas that we can bring into other aspects of our lives and future endeavors outside the world of games. Game-making is the context where we are exposed to a mixed and matched collage of models and methods that teach us new ways of knowing and of making decisions that have application in many other domains. Most essentially, when we make games we learn how to build them from component parts while conceptualizing and evolving the whole game itself — harmonizing the various components until they resonate with our players. This is a skill that is vitally important in our complexifying world, but is in frightfully short supply. What we learn from making games can teach us to analyze and to create in other domains. We simply need to know when and how to apply their lessons.

3. What's in a name?

As a critical first step in this endeavor, we need to better name these skills and processes and to identify them in other places where they occur naturally. Then we can easily and confidently say, "I know how to do that (clean this dataset, recruit those participants, connect to this server, or present these results) because I did it when I made this game." This is largely a question of naming and classification. It is always easier to teach and learn something when we can give it a shared name with clear attributes. Doing so also makes it easier to find those

attributes in other places and to apply the skills we've named when we do.

This leads naturally to an important second step. We need to teach ourselves to adapt and generalize the things we learn in games, even when there isn't a clear connection. That is, when we encounter something new, and our names fail us, we must still move forward. Maybe taking notes on a playtest is not the same thing as taking notes on a user test for a voting app, but they are close enough for us to adapt our experience to those differing concerns and goals, provided we have learned how to adapt. It is obvious in this simplistic example that taking notes is still taking notes regardless of domain, but what about when these connections are not so obvious? This kind of thinking, often called analogical or metaphorical mapping is key to adaptation and requires that we see the patterns even when the parts are different. This is a crucial skill in an evolving world that is little understood and not typically taught in games education (or general education for that matter), but must be learned and internalized through experience and reflection.

It behooves us as game educators and students to broaden our thinking and to intentionally tackle problems outside of games by explicitly bringing them into games education. This brings me to the third element of game-making that I'd like to consider: game-making requires that we become life-long learners. If we simply applied the same mechanics, designs, and objectives in each game we would quickly be bored and eventually be broke. Every new game requires new domain knowledge and new creative leaps. Game-making is a process of constant evolution both internally, in ourselves as makers, and externally, in the products we produce. Learning how to learn makes everything easier and anything possible, and it is a requirement of game-making. So, we need to always strive to challenge ourselves to build better games in case we are ever called upon to build a better world, or many virtual worlds as the case may be. By "unboxing" games education — that is, opening it up beyond the constraints of industry needs, beyond purposes of cultural critique, even beyond fun — what we find inside is a cauldron of creativity and skill that can, and should, be brought to bear on all manner of social problems, large and small.

4. Models of Instruction

As a next step, I want to consider where formal games education can help to better elucidate and elaborate the skills I've outlined above. In some instances, I believe, focused instruction on game-design and related disciplines does this quite a bit better than general or liberal arts education. But, there are tradeoffs, and there are some places where a focused games education can end up doing a disservice by too narrowly adhering to current technologies or industry trends.

There are really two distinct models of games education, with some considerable overlap between them, depending on where one receives that education. First, games education, particularly when we are talking about digital or computer games, can be primarily vocational in nature. In this model, games are taken largely as media artifacts to be designed and created in support of a global media industry. This kind of 'career and technical education', as it is sometimes called, focuses predominantly on the skills and roles that games professionals need to succeed in the industry. Programs like this tend to emphasize topics like art and asset creation using industry-standard tools, game programming and development with commercial game engines, and even the management and the business of games. These are important for students who want jobs in the games industry, and delaying this training in its depth and breadth — by spending time on other liberal arts and general education topics — can impede the progress of the game-maker, in the short term at least.

Those liberal arts topics do come into play when engaging in the critical and cultural analysis of games; however, since students in these programs tend to study games in order to make games, their critical eye is not usually turned toward critique of the culture industry or on the philosophical implications of making a certain kind of game in a certain kind of way. That is not to say that games created in this context do not have implications for these wider issues, — they do. In some sense, every game, like every other media artifact, is a political act in both its process and it's outcomes. It is simply that the motivation for study, the tools of the trade, and the context of the evaluation criteria are quite different when one aims to criticize the gaming industry, rather than approach it for gainful employment. A student may ask whether a game mechanic is intuitive and fluid, rather than whether it recreates

hegemonic modes of oppression. It may do both or neither, but it is rare to consider these outcomes simultaneously or equally, and the skills and knowledge needed to do so are quite different and do not overlap at the surface level.

Unsurprisingly, the other major approach to games education emphasizes critical and cultural analysis over technical and process mastery. Students of this type of games education may find that they spend time thinking about the emergence of the games industry in it's local or regional economic context, it's roles in society, and parallels to other media during their ascendency, such as radio, film, and television. Important and relevant scholarship from sociology, psychology, or history and cultural studies may be brought to bear on questions large and small. Whether the games industry perpetuates oppression and violence; Does a game company reproduce or maintain economic or social inequalities? Can a single game change perceptions of marginalized social groups? are all questions that students in these programs would be trained to consider instinctively, respond to with rigorous analysis, and communicate to a specialized audience.

Individual games themselves may be built and analyzed as part of these programs, and gameplay or asset creation are often considered as deeply as in more vocational approaches, however, the goal is usually not a playable or popular game so much as it is a game that 'says something' about it's subject matter or illustrates a particular social relation or innovation. Technical prowess is still a valued component of this style of learning, but it is less explicitly taught and not typically aligned to industry expectations. Students in these programs may still desire careers in the games industry, but they are less prepared for specific roles and responsibilities than those on a vocational track.
It's somewhat interesting, and not unexpected, to find that games education has diverged in this way. Debate around these differences have surrounded education generally, and technology-centered education in particular, for generations. Sometimes referred to as the 'head vs hands' debate, it encapsulates the differences resulting from foregrounding either the vocational needs of students, or their formation and contentment as human beings, as the primary goal of education. On the one side, getting a job and being able to competently perform that job can be the pathway toward greater economic stability, inde-

pendence, and self-reliance. In the post-slavery United States, Booker T. Washington took the position that the social advancement of blacks depended on their economic autonomy and technological training and urged newly freed slaves to acquire their own land and learn the trades needed to make it productive. What this position misses however, is that technologies change quickly, (even more true today) and this makes specialized work and workers obsolete if they are unable to reapply their skills to new endeavors. Learning to generalize existing skills to new contexts is something that is often overlooked in vocational education, but taken as a cornerstone of generalized liberal arts education.

The other side of this debate, naturally, emphasizes general or liberal arts education over teaching specific job and industry-related skills. The goal of liberal arts education is to create free-thinking individuals who can communicate effectively, connect ideas, and analyze deeply. More practically, this translates to the notion that, as industries change, essential skills such as writing and critical analysis will give workers more mobility and the flexibility to adapt to changing demands, and to potentially even drive that change toward emerging trends and issues. There is a philosophical, and even spiritual, undergirding to this position, dating back to the Enlightenment, that associates 'freedom of thought' or self-awareness with the generalized study of liberal arts and humane letters. The most obvious drawback to this approach is that students with this type of education tend to have fewer 'marketable' skills, need to be trained by employers at additional cost, and don't necessarily make more money or enjoy improved social standing. As a counterpoint to Booker T. Washington's approach, W.E.B DuBois offered the notion of the "Talented Tenth." The 10% of the black population that would achieve leadership roles in white society through (liberal arts) college education and effectively influence social change from the highest levels. Importantly, this group was expected to set aside personal gain and work almost exclusively for the betterment of their communities. I often wonder where these leaders can be found in the games industry, or if they are yet to emerge. Perhaps, we need to think more about what we, as educators, need to do to help form them.

This debate continues to this day, not only in regard to the advancement of marginalized communities in the United States and other

countries, but in the everyday arguments for and against vocational training for craftspeople of all types, including those who make games. The realization that most who study this debate eventually come to is that there needs to be some kind of balance to these approaches. Can students learn to build and produce in ways that align with industry needs while still maintaining enough distance to critique that industry or to move freely outside of it? Can students of the liberal arts become more attuned to best practices and practical skills without losing their independence of thought? Putting these philosophical questions aside, at a practical level, there is a more pressing question: What can games education do to strike this balance? It need not necessarily mean explicitly giving equal classroom time or weight in grading to these different approaches, but rather finding ways to instill the different 'habits of mind' associated with each approach so that students have a choice of cognitive tools in their toolbox alongside the technical ones. There is no reason why one cannot learn the tools of the trade if, at the same time, they learn how to exceed the limits of those tools, provided one is willing to put in the work. Arguably, the first is the prerequisite of the second, as long as one believes the second option is available to them.

5. Transferable Skills

Balancing out a liberal arts education is relatively straightforward. Learn the technical skills however you can, and apply them whenever the opportunity arises. It's a bit more complicated for vocational students, because 'soft skills' are harder to name, so that is where I will focus my attention for now, but much of what I will say is applicable to both kinds of students, and most interdisciplinary students more generally. There are a few transferable skills that those on the vocational tracks in games development might want to consider explicitly as strengths to be cultivated outside the normal topics in the curriculum. For sure, there are always some safe and obvious domain-based skills that will transfer outside of games without much thought or work. For example, artists and other asset creators, such as audio engineers, can easily take their expertise where it is needed. Motion capture studios, for example, routinely work on games, films, television, and other projects interchangeably, and so learning the trade of motion capture is easily applied to related fields with little additional consideration. Learning to create assets for games does not necessarily tie you to

games for the entirety of your career in many of these cases, but what if the games student wants to wander further away from their stock-in-trade?

Transfer to other, less-related areas can be trickier by different degrees. For example, moving from 3D animation to 2D might be a bit more difficult than applying 3D skills from games to films, but it is not nearly as big of a difference as moving from character design to interior design or from environmental design to traditional architecture. Aside from practical considerations that are common to most job-seekers (it is often difficult to get an opportunity in other industries when you are trained so rigorously in one) understanding what skills can transfer and how to demonstrate that to potential employers becomes the central issue. On the one hand, environmental design for games and architectural design must have clear overlaps in modeling tools and common points of reference (architectural styles for instance), but creating habitable spaces is a different concern from creating playable spaces. Obvious questions such as: How are we to know where the similarities begin and end? are only the beginning of this journey. More complicated ones, like: How do you learn the work styles, assumptions, and concerns of architects without being enculturated through schooling? become paramount for interdisciplinary students of all stripes, not just those who make games. There are no clear-cut solutions to these problems, but it behooves the interested game student to take what skills they have and employ them in a variety of contexts to build experience outside the world of games. This will inevitably make their work in games stronger as well. Tried and true networking practices are worth the effort for these students. Internships where you can bring your trade to a new context are worth exploring. For example, a character designer may be able to intern at a marketing agency as a graphic designer. In general, thinking broadly about how to learn about new opportunities, and keeping an open mind about what kinds of experiences might be useful will help to build the mental flexibility that is ingrained in liberal arts students.

Similar things might be said of programmers. Programming in Unity is different than programming in Unreal in many material ways, but the principles of programming remain the same. A solid foundation in programming, as part of a liberal arts education for example, provides

enough of a foothold to stretch in many different directions, in game programming and beyond. In the same way, principles such as proportion and shadow underlie both paper sketching and 3D modeling. Identifying and emphasizing these underlying, "First Principles" as they are sometimes called, is an essential part of building a transferable and marketable skill set outside of games.

These examples of First Principles are still of the straightforward variety, however. In my earlier example of building an XR training simulation, these kinds of technical and process-oriented skills are essential for getting the job done, but not quite enough to get the needed results. Relying on foundational and explicit elements of your training to change career directions gets more difficult when those skills are difficult to name, and their value and importance is not explicitly communicated or shared among groups. Students in game programs may excel at being able to break a complicated sequence of user inputs into simplified and stylized on-screen instructions, as is common for game tutorials, but it's not always going to be clear to employers outside of the world of games, or technology more broadly, what kinds of analytical and communication skills underlie those abilities and how they might apply to their current hiring needs. It behooves the games student in these circumstances to reflect on where their aptitudes and affinities lie so they can reduce their talents and abilities to an essential core, to define their own First Principles in a sense, so that they can be repackaged and re-articulated as needed. This is no easy task, I don't claim to have easy recipes or a list of categories or characteristics to supply. One thing that is required though, is a more thorough understanding of other elements of liberal arts education, so as to at least know where to look for these generalizable skills. Basic communication and media theory, as examples, are good places to begin. Systems and design thinking are also clear places to find overlap. Again, returning to my early example, it has been the students who have experience in project management, experimental design, and good communication skills who have given the project the shape it needed to effectively do its job. Pulling together literature on law enforcement training practices, making experimental subjects comfortable enough to authentically engage the simulation, or even just being able to see the value of those things and have the willingness to take ownership over them despite a lack of experience have proven essential keys to our overall success.

Building intuition for these types of skills deserves more focus.

6. Some things to take away

One thing that I have noticed about games education is that general research skills are also an area where games students are likely to excel. These can run the gamut from creative to data-driven. Games are commonly considered to be forms of simulation, simplified or stylized representations of objects and processes in the world, but game designers are not expected to be masters of these real-world phenomena a priori. They are tasked with discovering their inner workings — the processes and components that make these phenomena go — and translating them into new, often digital, media. Research and learning are necessary skills here, even if the end result is entertainment and not utility. Designers must be able to decompose phenomena into different parts and connections, identify critical processes from less important ones, and match these to the capabilities of the game medium. These are neither straightforward nor simple things, and they cannot be reduced to a checklist of items. What's required here is a progressively deeper iterative research approach aimed at learning core principles and understanding the way experts in these domains think, all while continuously mapping these onto known and imagined mechanics, tropes, and conventions.

The flip side of the research skills noted above is the ability to reflect and repackage that research for multiple audiences. This is a communication skill that I always emphasize to my interdisciplinary students, particularly those who want to go on to work in UX (User Experience) related jobs. Every artifact you create will be repeatedly interpreted by people with different assumptions. Visual designers will attend to the visual elements of a report and judge it by the clarity and simplicity of your presentation. User testers may look at the same report and focus on the metrics and measures provided as the basis for its usefulness — managers seem to have an entirely different agenda when viewing that same report. Understanding the nuanced assumptions and needs of these different audience groups, and knowing how to craft communications using the style and media that they understand best is an essential skill in any industry. The ability to adapt research findings and communication style to specific media and specific audiences is

part of an interdisciplinary core skill set that should be emphasized and practiced inside and outside the classroom.

One additional area where I think interdisciplinary games students may also find common ground with other areas of expertise is in quantitative reasoning. In the current landscape digital and computer games are increasingly data-driven. Why let all that useful user-data disappear into the internet when it can be harnessed for all manner of commercial and personal insights? Defining useful metrics and ways to capture and assess those metrics are invaluable to games development, as they are to many other industries from retail, to education, to urban planning. They are essential to demonstrating the effectiveness of our training scenarios, for example. Skills in data analytics are in high demand, and students with both vocational and liberal arts backgrounds should be able to easily make a case for their qualifications. It's actually a fairly easy leap to demonstrate how gathering data and using statistical methods to determine average completion times for a game level, for example, might be good training for analyzing commuter trip times on a particular railway. Data methods are among the most portable of games-related practices and some time should be spent understanding how these skills are used in other domains.

7. Conclusions

I've tried to lay the groundwork here for a way of thinking about foundational skills learned through the study and practice of making games that prioritizes the portability of those skills to fields and endeavors that go beyond the world of gaming. These other fields can be quite closely related to games, like the XR experiences I talked about at the beginning of this essay. But, I've also tried to make the case that we should be considering applications and disciplines that are seemingly unrelated to games and gaming. I've identified a few key categories of skills and knowledge that I think are readily portable to other fields, and I've tried to describe a way of thinking about instruction that could help impart the cognitive flexibility needed to adapt skill sets to new domains. What's next, I believe, is to make ourselves more aware of opportunities to call out these transferable game design skills when we see them in the classroom and in the wild, so that we can learn to recognize them in their continuing study and practice.

INTRODUCTION

Rebecca Rouse,
Björn Berg Marklund &
Anna-Sofia Alklind Taylor

What Happens When We Play: A Critical Approach to Games User Experience Design & Education brings together research and reflection from both faculty and graduate students involved in a three-course series that is part of University of Skövde's Games User Experience (GUX) Master's program, launched in 2020. The collection shares insights from the new GUX curriculum, which takes a critical-making approach inspired by recent research (Flanagan, 2009; Ratto, 2011; Marcotte & Khaled, 2017; Rouse & Corron, 2020; Jungnickel, 2020). In our version of a critical-making approach to the pedagogy of GUX, we combine practical projects done in collaboration with game studios, critical cultural theory and history, and design theory and hands-on work in the practice of games user experience design and analysis.

This book is a collection of contributions from both faculty and graduate students, presenting a perspective on education drawn from critical pedagogy and norm-critical theories (Kalonaityté, 2014), which positions students and faculty as co-learners in a co-constructed educational journey (Darder, Baltodano & Torres, 2003; Adams et. al., 2018; Björkman & Bromseth, 2019). In addition to contributions from the core faculty of the three courses, the collection also gathers work from several guest lecturers who visit the courses, further de-centering the notion of a single instructor or group of instructors as a sole source of knowledge or 'sage on the stage.' Faculty chapters are drawn from lectures, workshops, and conversations facilitated in the first two courses, while student chapters are drawn from self-directed research projects conducted in the final course of the three-course series.

The seemingly simple question posed by our title, *What Happens When We Play*, opens up a range of complex possibilities for inquiry, all of which we argue fall under the purview of contemporary GUX that centers our focus on the player. For example, who do we mean by "we" in our title? Who is playing, and who is left out? Who wishes to join in but cannot, and who may join but chooses not to? Why? In addition, our title opens up questions about the scope of play - when can we be said to be "in" the game? Where does the play experience begin, and end? What happens just before that, and what happens after? This perspective on games and the user experience is intended to stretch the boundaries of the field, encouraging GUX students, researchers, and workers to question both more deeply and broadly as they aim to both understand and create player experience.

1. About the GUX Master's Program

The momentum for creating the program began in 2010, when GUX (or Games User Research, which was the agreed upon term at the time) started being discussed more widely in game development communities. IGDA hosted its first summit with their new special interest group on the topic, and it became evident at developer conferences that more and more game studios began hiring employees solely dedicated to testing beyond just QA purposes. Big studios started making GUX into a more explicit part of development pipelines, and with its blending of science and development it seemed like GUX could become a strong natural conduit between academic research and developer practices. Starting up a program in a field that had yet to fully find its identity would be a gamble – the discipline hadn't even fully settled on its own name (the currently accepted moniker, Games Research & User Experience, was established only in the late stages of this program's planning process). However, it became increasingly clear that there was a lot of potential in this type of program, and so with collaboration from other faculty in the Division of Game Development, the GUX Master's program was launched in 2020, under the directorship of Björn Berg Marklund. Now that the program has come to fruition, we are eager to share some promising early results.

The vision of the GUX Master's program is to provide students with a wider variety of perspectives than are often presented in game devel-

opment curriculum, to develop an understanding of the discipline that facilitates graduates of the program moving into industry or academic contexts as innovators across both research and praxis. While it has become common to include individual courses or modules in games education that focus on understanding player experiences, the GUX Master's program has a holistic, cohesive emphasis on understanding the human rather than the game, design method, or interface. This perspective emphasizes the human and technological in cultural entanglement with one another, as opposed to more binary notions of the player as a consumer or interactor with a game system. The emphasis on combining critical lenses with hands-on qualitative and quantitative approaches to GUX analysis pushes back against more common technical, instrumentalist approaches to GUX that foreground biometrics, surveys, and heat-mapping (e.g., Drachen et al., 2013; Drachen & Connor, 2019; Ekman et al., 2012). These approaches, while valuable, when used in isolation tend to overlook a culturally situated understanding of the object of inquiry as well as lack a reflexive interpretation of the human components of their own methods. Ben Green's work, for example, provides a strong argument on the importance of data scientists recognizing "themselves as political actors engaged in normative constructions of society" (Green, 2020; 7). We find a similar imperative for GUX workers today as well, likewise pushing back against arguments that consider political, social, and ethical entanglements in games to be outside the purview of the design and analysis process. GUX practitioners are in a position where they can empower players merely by being more mindful when they construct research processes and play-testing environments, and by continuously reflecting on their own epistemological assumptions.

In line with this more holistic perspective, the GUX Master's program plan of study includes experience outside the classroom, working off-campus with professional game development studios as GUX research consultants. The curriculum also includes coursework in hands-on design and analysis methods, and instruction in the epistemologies and histories of the many disciplines that contribute to contemporary understandings of games and the experiences of people playing them. Through this multi-modal curricular design, students gain insights into a number of different issues related to games user experience, such as: the long history of colonialist racism that still impacts current research

and game design; old and new technologies for understanding experiences; design studies and cognitive sciences; and the politics embedded in technologies themselves as well as development and design processes. Students then weave insights from their exposure to this wide range of interdisciplinary materials back into their own design and analytic processes, working toward expanding the purview of GUX research and practice for the future. By critically examining contemporary practices in our work as teachers, researchers, and developers, GUX can change our way of understanding games and player experiences. Otherwise, it risks becoming just another tool to better cater to presupposed player audiences, implement current design conventions for games in well-established genres, and to more efficiently reproduce and fine-tune systems already in place.

2. Overview of the Book

In the opening Preface, Georgetown University faculty member Evan Barba shares an expansive perspective, situating the relevance of GUX beyond the field itself. Chapters 1 through 4 provide faculty contributions, and Chapters 5 through 16 present graduate student research. While the chapters represent a wide diversity of topics and approaches, we can identify several threads or themes that run throughout, and identify them here as section groupings to assist the reader in putting the works in conversation with one another.

3. Section 1: Lectures

The opening section of the book presents teaching materials from faculty at the GUX programme, as well as guest lecturers who have visited GUX courses. These chapters consist of written versions of lectures, conversations about different research topics, and short introductions to fields of particular importance to contemporary GUX work. We share these chapters as a pedagogical resource, and as a way for us to develop our own pedagogy further as instructors. Because beyond providing insights into the field of GUX, these chapters also serve as examples of what we hope to achieve in our programme, and of our critical pedagogy strategy. We aim to iteratively phase out of a classic classroom-lecture education format with teacher-to-student knowledge transmission. Instead, we have developed this set of chapters as an entry point to GUX scholarship that students can use for self-di-

rected learning. Future iterations of our courses will include increased time in the classroom for conversation on these topics, instead of one-way information presentation through lecture formats.

In Chapter 1, "Design Power," Rebecca Rouse presents and de-bunks four common myths about design practice as an introduction to theories of critical design, informed by Science and Technology Studies scholarship. The four myths include: Technology is Neutral; Unintended Consequences Can't Be Helped; Technology can Create Empathy; and The Designer is Invisible. Through a range of concrete examples from airport wave scanners to immersive VR journalism, and concluding with a set of design principles for centering the human, Rouse provides an accessible entry point to complex ethical issues relevant to the GUX field. In Chapter 2, "Postcolonial Threads in GUX: A Conversation," an edited transcript of a recorded conversation with Björn Berg Marklund, Amit Goyal, and Souvik Mukherjee is presented. The conversation emerged as a continuation of Souvik's guest lecture in one of our courses, in which he had introduced game analysis from a postcolonialist perspective. In this conversation, Souvik both describes the purpose and results of his extensive and ongoing research on the topic of postcoloniality and games, and also shares his own experiences as one of the first games researchers in India. Amit Goyal joins the conversation bringing the perspective of a current graduate student researcher, and independent game developer working in India in the mid-2010's. In Chapter 3, "Understanding a Complex Inheritance," Rouse shares a media archaeological approach to unpacking a range of lineages relevant to the GUX field and Games at large, including discussion fo the history of measuring people, the origination of game culture, and the entanglement of military and computer science legacies in games. By tracing this interconnection of relationships, across time periods and materialities, Rouse provides and overview of the complex history Games is a part of, and helps the reader to make sense of current challenges in the field through understanding of historical legacies. The section closes with Chapter 4, "Players' Embodied Cognitive Interactions in VR Environments." This contribution from Maurice Lamb's work on Virtual Reality (VR) provides an overview of fundamental theories of embodied cognition and human behavior, as well as discussions of a selection of Lamb's own VR research projects. As he, himself, points out, these projects stand out from other VR

research in that their "development was completed without dedicated technical assistants and with relatively minimal budgets." Thus, these studies also prove that interesting and novel work with new advanced technologies can be done even on smaller scales with a 'DIY' ethos.

4. Section 2, Chapters 5-8: GUX, Industry, and Accessibility

This section revolves around the importance of understanding players' needs, ways of evolving GRUX practices to accommodate for those needs, but also how GUX methods can be made more accessible to developers and emerging researchers. Section 3 also involves hands-on advice for how to make games more accessible and enjoyable, both through better game design and testing, but also by implementing ways in which games automatically adjust to players' play styles. In Chapter 5, "Analytics: an Indie Perspective", Amit Goyal and Valgarður Ragnheiðar ívarsson investigates how GUX methods that the community often take for granted - game analytics - are actually approached and used by indie developers. The chapter includes interviews with different indie studios in Europe and North America about their experiences using game analytics. In these discussions, they both talk about how they do use analytics, but also about the reasons for why they don't. In Chapter 6, "What Medical Research Can Teach us about Playtesting", Wilmer Tjernberg does an in-depth analysis of participant recruitment processes in GUX work. He presents an overview, and critique, of the current state of participant recruitment in the industry, and contrasts it with sampling processes in other fields of work. In particular, he looks to medical research for guidelines, as no other field comes close to discussing the complex issues of participant recruitment and its ethical ramifications and effects on study validity. Chapter 7, "Dynamic Difficulty Adjustment: A Practical Case Study," presents S Nahid S Moosavi B's chapter is about the practical implementation of Dynamic Difficulty Adjustment (DDA) systems in games. In short, DDA is a way of making real-time adjustments of game difficulties and environment designs in different ways to better suit the player's performance and actions. The chapter introduces the reader to the theories that underlie DDA systems, and describes how 'difficulty' is a complex concept, and that difficulty and player enjoyment can't be measured on a 2D chart. She also provides a step-by-step guide for those who want to implement

simple DDA systems to improve their games. Finally, Linnéa Eklund's research in Chapter 8, "Creating Games that Everyone Can Play," gives the reader an overview of accessible game design and play-testing methods. The chapter focuses on giving designers and developers in small studios actionable ways to take their first steps towards creating more accessible game experiences.

5. Section 3, Chapters 9-12: GUX in Cultural Entanglement

The third section showcases graduate student research from the GUX program that focuses on the ways in which games and players intersect in social and cultural contexts, and how player-game relationships are affected by their cultural contexts. In Chapter 9, "Outcomes of a Non-Diverse Game Industry" - the final student chapter of the book - Ülkü Kutluhan Bayrak examines misrepresentations of different cultures, countries, religions, and ethnicities in games. By using examples of misrepresentation in game content, as well as examples of misrepresentation in a particular part of the industry itself (voice acting), the chapter explores why misinformed ideas and portrayals of the "non-West" in particular seems to be so common in games. The chapter also includes short interviews with Souvik Mukherjee (who also contributed chapter 5 in this book), and indie developer Rami Ismail. In their conversations, they discussed how game studios use outside consultants in attempts to iron out problematic aspects of their game, and how the homogeneity of the game industry makes the issues of misrepresentation in games so pervasive and prevalent. Chapter 10, "Using the Game Behavior Change Wheel to Design Interventions against Toxic Flaming Behavior in Overwatch: a Case Study," shares Ziwen Michael Zhong's research into the issue of toxicity in multiplayer games and how toxicity becomes increasingly prevalent in communities centered around meritocracy. Making a unique application of an interdisciplinary framework for behavior change, Zhong works to identify design opportunities for countering toxicity. Alongside this analysis, Zhong proposes several original design models for improving communication in online team-based games to create more inviting communities, healthier interpersonal interaction, and better game experiences. In Chapter 11, "A Taxonomy of Queer Game Design Aesthetics in MMOs," Sandra Alexandersson writes about Massively Mulitplayer Online Games (MMO)

design and aesthetics, presenting an original taxonomy of the key factors that make some MMOs especially attractive for queer players, and a discussion of how MMOs can become spaces for queer game communities. With *Final Fantasy* XIV as a case study, Alexandersson formulates a hypothesis about why some MMOs provide queer players with "a place to belong and find voices that can echo their own as they explore their true identities" (p. 286). To close this section, in Chapter 12, "Death of the Gamer: Grief and Memorialization in Digital Culture and Video Games," Diana Cristina Răzman examines the range of ways in which digital technologies have come to be included in the social and cultural practices related to death and dying, with a particular focus on the ways game communities grieve and memorialise a player's passing away. Răzman discusses the different types of digital footprints people leave behind them when playing games, and how these can be used to aid in the memorialization of players, or conversely, traumatically upend a person's grieving process. In short, Răzman explores how the way we play is important "not only during our lifetime, but perhaps even after" (p. 316).

6. Section 4, Chapters 13-16: The Voice of the GUX Researcher

To open this section, which foregrounds the voice and personal experiences of GUX graduate researchers, Chapter 13, "Retry From Checkpoint: Reflections on Evolving Research" contains Veronica Johansson's personal journey of fine-tuning her skills as a novice GUX researcher. By sharing her personal experiences with GUX methodologies, following study designs from her very first attempts at play-testing and contrasting it with her most recent ones, she outlines the trial-and-error nature of becoming a researcher. The chapter both introduces some common methodologies that are useful for novices, and how they can be employed to great effect once they've developed their skills further. But, it also shares some valuable lessons for those who might be wary of starting out their careers in GUX. Weijia Erica Huo's research is presented in Chapter 14, "The Attitude of Chinese Parents to Games and Kids." Huo's chapter provides a historical analysis of Chinese cultural norms, schools of thought, and how social and political developments in China have informed a particular generation of parental attitudes towards games. Huo also discusses as well as government legislation

on game content, and shares her own perspective and personal experiences growing up as a gamer in China. Chapter 15, "Trans play: Imagining the future of trans games" Felix Redig presents the reader with their experiences of being a transgendered gamer and game developer. In their work, Felix provides an introduction to transgender issues in games as they is described in literature and interviews with well-known designers and researchers. Felix highlights both the important work being done to further the inclusivity of trans people in game communities, but also how a lot of previous research on the topic rests on problematic foundations. But they also support their discussion with the outcomes of a design workshop with other transgendered gamers, in which they created their own "ideal" game. With these components as their foundation, Felix provides insights into what transgendered developers, as well as players, want to create, and what they want to see in games. Finally, in the concluding chapter of the volume, Chapter 16, "Same-Sex Romance in Games," Sandra Alexandersson discusses her personal experiences with same-sex romances in games, and her relationship to games and game characters growing up as a queer gamer and game writer. The chapter presents an overview of literature of the history, and contemporary discourse, on representations of LGBTQ romance in games. But, she also explores the methods you - often subconsciously - have to develop to find yourself, and your identity, in a medium and industry that continuously misrepresents or excludes you.

7. Conclusion

One contribution of the volume is to help advance discussions of curricular approaches to teaching in Games. These discussions have been rather limited so far, and when critical approaches are discussed they are most often separated into a Game Studies curriculum, disconnected from Game Design practice. Much recent innovative pedagogical work is occurring in the field, however, at the level of individual courses, as collected in this recent two-volume anthology (Ferdig, Baumgartner, & Gandolfi, 2021). As with the pedagogical research into critical making, the approach in the GUX Master's program is one of critical and design theory and practice fusions; an approach we feel may benefit games education at large moving forward in terms of larger curricular and structural design. After all, both students and faculty should emerge from academic programs equipped to not only innovate technologies and designs, but also innovate the general culture and habits

prevalent in the games industry, and think and design in a thoughtful and future-oriented way regarding the larger role of games in culture and society.

Another equally important contribution of this collection is the centering of our own current graduate students as co-authors of the volume. This provides an expansion of current discourse which is most often limited to researchers or faculty alone. The inclusion of student work not only creates a platform for the student voice, but may also allow educators to more deeply understand the interests of students doing graduate work in games, and act as a resource to support further curricular innovation. While prior work has presented both student research and faculty contributions in collections together, these works have tended to provide either a more instrumentalist approach to game design that is fully centered on a normative form of practice (Zagal, 2019) or a humanistic perspective on games that does not engage with industry but rather focuses on other forms such as art games (Kristensen, 2016). *What Happens When We Play* seeks to create a space of synergy between these types of works, acting as a bridge between more instrumentalist approaches to games and game studies.

This book is an eclectic collection of perspectives, as all authors have approached the field from different perspectives. There are chapters that aim to discuss and elevate GUX as a praxis, discussing ways in which methodologies can be improved, how new research technologies can be developed, and highlighting current limitations and challenges in study designs. Then, there are chapters that approach it from a broader perspective, looking at GUX as a praxis situated in - and affected by - social, historical, and cultural contexts. As a reader, whether you want insights into how to do GUX, or how to analyse it, we hope you'll find something that resonates with you.

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LECTURES

Chapter 1

Design Power: Four Myths about Technology, the Role of the Designer, Power, and Oppression

Rebecca Rouse

Abstract

This chapter is based on my lecture from the GUX masters program Research and Development Course, and provides an overview of key issues in critical design from a Science and Technology Studies perspective as relevant to GUX and the Games field at large. A set of design principles are also provided, bridging theory and practice.

Keywords: Critical Design, Science and Technology Studies, Games

1. Introduction

When we talk about ethics in design, we are talking about taking a critical approach to design. This means not only viewing all elements of the design with a critical eye, such as the technology, the techniques, systems, processes, and outcomes, but also looking at ourselves, the designers, with a critical eye. What we are ultimately interrogating in a discussion of ethics is questions of power and oppression. This chapter provides an overview of critical design as relevant to GUX, presented as a response to four design myths: 1., that technology is neutral; 2., that unintended consequences can't be helped; 3., that technology can create empathy; and 4., that the designer is invisible. This chapter will also introduce you to a set of design principles for use in practice, as well as a list of sources on this topic for further reading, which are provided as a bibliography at the end.

Design is very powerful, and as workers in a design field we often have

quite a lot of power over the design process. It is important to use that power carefully, and to be aware of some of the common myths about design that can trip us up. In order to do that, we will look under the rock today, at some of the ugly misuse of interactive and immersive technologies, and the reason we do this is because critical examination is necessary to move the field forward.

2. Myth #1: Technology is Neutral

This first myth sounds like it is just common-sense and must be true. We often think that technology is neutral and that its impacts depend entirely on how we use it. In everyday life, we may feel we have quite a lot of power and agency with technology, and that our intent is potent in determining outcomes. But, this notion has been challenged by scholars in the Science and Technology Studies field for many years. A notable critique of this idea comes from Landon Winner's article "Do Artifacts Have Politics?" (1980) in which he states: "In controversies about technology and society, there is no idea more provocative than the notion that technical things have political qualities [...] cases of what can be called inherently political technologies, man-made systems that appear to require, or to be strongly compatible with, particular kinds of political relationships" (Winner 1980, p. 121). Winner analyses multiple examples and ends up concluding that while it may be true that not all technologies have embedded politics, most do, and the question is more one of degree. One example he looks at is the technology of the atom bomb, as an exemplar in which the core nature of a technology has shaped cultural and political contexts that surround it. The dangerous nature of the atom bomb technology is discussed as necessitating particular structures of hierarchical power and control for regulation.[31] Winner's thesis stems from the viewpoint that technologies do not meaningfully exist outside of use cases. Technology outside of a social, cultural, political and economic system is not real technology, but rather an imagined idea about a technology.

Another more contemporary example that demonstrates this entanglement of technologies and embedded politics is the millimetre wave

1 This system is not without its problems, as discussed in detail in the April 7, 2017 episode of the RadioLab podcast hosted by Robert Krulwich and Jad Abumrad. The free transcript is available online: https://www.wnycstudios.org/podcasts/radiolab/articles/nukes

scanner found at airports today (see Figure 1). This example is discussed in more recent scholarship from Sasha Costanza-Chock (2020), in which they identify the narrow ways the scanner conceptualises the 'normal' and 'safe' human body, marking and penalising those with bodies deemed 'different' as dangerous, such as trans and disabled people. The capabilities of the core technology of the scanner, electromagnetic waves that bounce off of and detect the surface of the body, are only meaningful for airport security purposes when put in relation to a comparative set of data marked as "normative" (and therefore "safe") — and herein lie the embedded politics of the technology.

Turning to games, an example of the embedded politics within technology can be found in the seemingly invisible infrastructure of the game engine itself. Game engines are software programs used by designers to create digital games, and are also the underlying systems that run games during play. In James Malazita's analysis of the UnReal engine (2018), he examines the ways in which the the engine itself communicates embedded politics, which it also forces (or at least strongly encourages) onto designers who work with it. In this case study, he looks at the example of a DLC being designed for the *BioShock* games series. The series features a playable character, Booker, with familiar point and shoot capabilities, with a side-kick non-playable character, Elizabeth, who is nonviolent and moves through the game by using magical abilities to make tears in the time-space continuum between worlds. In the DLC, the designers wanted to make Elizabeth a playable character and keep her true to their original conception of her, as a character with non-violent, magical capabilities. But in spite of the designers' best intentions, the Elizabeth character ends up suffering a violent trauma at the start of the DLC, which causes her to justify the use of violence, pick up a gun, and move through the world using Booker's mechanics, not her own. As Malazita shows, the engine itself strongly encourages this reductive move, and under the time and resource constraints common in the games industry, very nearly determines this, in spite of designer intention.

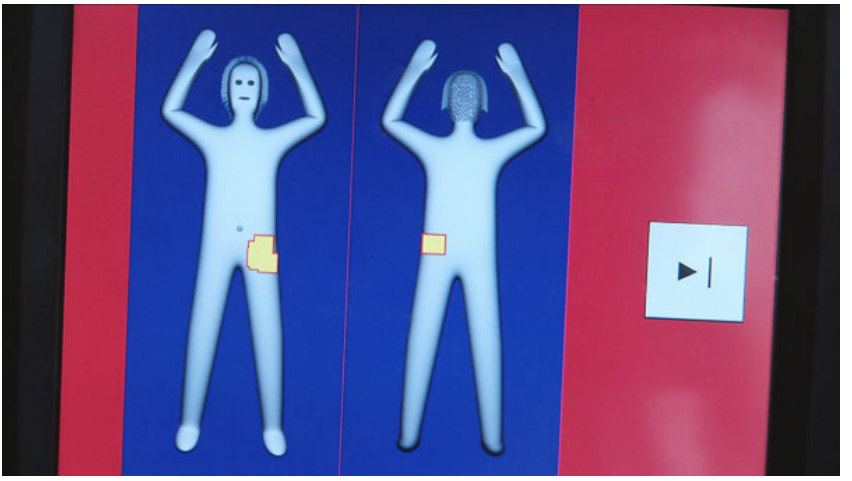

Figure 1. Airport millimetre wave scanner interface display. Image credit: Wikimedia Commons
https://commons.wikimedia.org/wiki/File:Koerperscanner-fund.jpg

3. Myth #2: Unintended Consequences Can't be Helped

This second myth also sounds like common sense: if I, as the designer, do not intend some particular outcomes or impacts resulting from my design, this cannot be helped because I could not have foreseen what I did not intend. However, when we look more closely at the rhetoric of the unintended consequence, we see a more complex picture. Scholars Nassim Parvin and Anne Pollock (2020) have examined the ways in which the concept of the unintended consequence circulates both in academic research and in popular culture. Parvin and Pollock identify "a subtle but significant shift in usage: those consequences of technology that can indeed be anticipated in advance but that fall outside the purview of the specialisations that conceive or implement products. [...] Phenomena described as unintended consequences are deemed too difficult, too out of scope, too out of reach, or too messy to have been dealt with at any point in time before they created problems for someone else." (Parvin & Pollock 2020, p. 322) In other words, unintended consequences can indeed be foreseen, just not by designers who decide it is outside their purview to anticipate them.

Here we can return to Langdon Winner's article to examine a so-called unintended consequence in the example he shares of urban planner Robert Moses' design for bridge overpasses on the parkway connecting Manhattan to the Long Island beaches in the mid-twentieth centu-

ry. To think about unintended consequences in the case of the parkway bridges, we have to ask, what is the user experience of the parkway? To ask that question, we have to think about who we would talk to, a car driver, a cyclist, a pedestrian, or a bus passenger. Reflecting on the 1960s in the U.S., we can also think about who is more likely to be a car driver vs. a bus passenger. Add in the information that these bridges are too low to accommodate a city bus, and we can see how the bridges, even as a so-called unintended consequence, become a powerful tool to maintain racial segregation and class segregation to keep people of colour and less affluent people away from the Long Island beaches. One of the problems with the language of unintended consequences in a case like this is that the concept can let the designer off the hook in ways that allow for the evasion of accountability for impact, regardless of intention or professed intention.

Another example that is a useful illustration of the rhetorical power of unintended consequences is Joseph Bazalgette's 19th century underground sewerage system for the city of London. Here we can also understand the ways in which the purview of the designer was demarcated, when we ask questions about the user experience of the sewerage system from multiple perspectives. While the sewer revolutionised the city with positive health and hygiene impacts for many, the consequences of hiding waste from sight has also led to the oppression of some people, namely the sewage workers today who must go down into the tunnels under London, wading waist deep into raw sewage, to chip away by hand at the horrific "fatbergs" accumulating there, which threaten to stop up the whole system. Above ground users of the system continually flush fats, oils, and products like wet wipes, which then coagulate in the hidden tunnels. In spite of public information campaigns to educate above ground users, because the impacts are hidden from view, convincing these users to change their behaviour has been difficult. For the underground workers, however, the job of managing these "fatbergs" is all too tangible. Workers are not given sophisticated equipment, the stench alone is overwhelming but also toxic in nature, and due to the cramped design of the tunnel system, work is largely carried out by hand.[2]

2 Part of one fatberg has been collected into he Museum of London, which you can read about on the museum website here:
https://www.museumoflondon.org.uk/discover/where-whitechapel-fatberg

Finally, an example from games also provides a useful illustration of the power of the framing of unintended consequences: GamerGate. This 2014 uprising of conspiracy-fuelled misogyny in the games community crescendoed to credible threats of physical world violence against many prominent women in games. Could anyone have foreseen this? In commercial games we have a media form that doubles down on misogyny, violence, and racism even more so than Hollywood, with an interface based in design patterns that allow for anonymity and severely foreshortened or low-resolution communication, encouraging all manner of anti-social behaviour. The answer here is not more technology, or to oppress more people by making them work through the "fatberg" that is content moderation. Content moderation workers have a high suicide rate. No, the answer is to change the content within games, but to do that, designers may actually need new tools, and new infrastructure, as we saw with the *BioShock* example above.

4. Myth #3: Technology can Create Empathy

This myth takes a lot of work to unpack, so we will spend a little more time with it. This myth is entangled with Myths 1 and 2, about technology as neutral and about the inevitability of unintended consequences. To begin our exploration of this myth, we can ask how tech-created empathy often shows up. It is commonly linked with the idea of "giving voice" to oppressed people, but this does not usually entail letting them speak for themselves or having them take on the role of the designer. Instead, the strategy of giving voice usually refers to designers' representations of others, in an attempt to increase visibility of these representations. So in practice, giving voice is often enacted through a strategy of increased representation. For example, designers may add a female character or a character of colour to a game, and see this as "giving voice" to members of these groups.

But representation does not equal power, and especially not when someone else who does not share your social identity is creating that representation (although we must be careful not to equate social identity with political positioning. Internalised oppression or self-hate can certainly be powerful masters). Peggy Phelan critiqued the strategy of increased visibility during the 1990s identity politics movement, noting that: "Visibility is a trap; it summons surveillance and the law; it provokes voyeurism, fetishism, the colonialist/imperialist appetite

for possession [...] If representational visibility equals power, then almost-naked young white women should be running Western culture. the ubiquity of their image, however, has hardly brought them political or economic power" (Phelan 1993, p. 6-10). So perhaps the push for visibility is a trap, when it is not accompanied by structural change. This is not a new idea, but remains relevant.

With the advent of second-wave VR in the 2010s, we see claims about the suitability of technology for fostering empathy become even more pointed. Immersive filmmaker Chris Milk famously described VR as an "empathy machine" in his 2015 TED Talk, stating that by using VR "[...] we become more compassionate, we become more empathetic, and we become more connected. And ultimately we become more human"(Milk 2015). Milk's claim has been critiqued by many scholars (including Clune 2016; Murray 2020; and Nakamura 2020) but it is worth examining still further because it is emblematic of a pervasive perspective on technology today often encountered in the technology industry, STEM disciplines, and even popular culture at large. The seeming simplicity of the "empathy machine" perspective belies the many layers of assumption underneath, many of which I believe hamper designers in achieving meaningful impact with their works. To get at these assumptions, we need to ask the following questions:

- What is empathy?
- How does social change work?
- What does all of this mean for design with immersive and interactive technologies like we work with in games?

Looking at the tacit assumptions that underlie statements about VR as an empathy machine, we can see there are two main parts to this larger claim. One part is a claim about what empathy is, and how it can influence people and society. a second part centres on the nature of interactive, immersive media as particularly conducive to fostering this specific type of empathy in viewers. What is meant by empathy in the usage from Milk and other designers working in immersive media today should be made explicit. Empathy, in their usage, denotes a positive outcome in the viewer or interactor, due to a change in attitude or belief, with a likelihood that this change may result in pro-social be-

haviour and even actions advancing justice. It is worth examining how this colloquial understanding of empathy holds up against scholarship on the topic, which I will discuss in a bit. More deeply embedded in this definition is an implied model of how social change works, and so the question also arises as to whether or not this empathy-based model of social change is accurate. At the foundation of this set of assumptions is an idea about the ontology of technology itself, as a labor saving device that is capable of simplifying complexity. (see figure 2).

Viewed from this perspective, it becomes easy to see why this idea of the empathy machine could be so attractive to many across the technology industries, STEM disciplines, and popular culture. The reasoning may go something like this: if only we can use interactive or immersive technology to unlearn prejudice and inspire action, then the hard, painful work of the emotional and intellectual labor of coming to terms with prejudicial beliefs and attitudes could be made easier. There is a connection to be made here with Robin DiAngelo's concept of white fragility as discussed in her original paper (2011). DiAngelo developed the concept of white fragility to understand and name the defensiveness, fear, misdirected anger, and inaction often displayed by white people when confronted with participation and complicity in perpetuating oppressive racist systems and these systems' devastating costs to others. The idea of using an immersive, interactive entertainment technology such as a game or VR experience to 'change minds' via empathy (which is here understood as an almost involuntary, emotional response) plays into a fantasy that neatly aligns with a privileged positionality, seeking quick, easy, and relatively painless methods of mitigation that fall far short of actual change. Worse yet, these projects are sometime tokenised and held up in hyper visible ways, that signal to others that change has been achieved, when it has not, and so ironically function to foreclose possibilities for meaningful change.[3]

3 Sara Ahmed has discussed this kind of slight-of-hand in the uneasy relations between institutions and diversity work as follows: "[...] the tools you introduce to address a problem can be used as indicators that a problem has been addressed. [...] A program developed in response to a problem is assumed to resolve a problem. When the problem is not resolved, the resolution becomes the problem." (Ahmed 2016, 110).

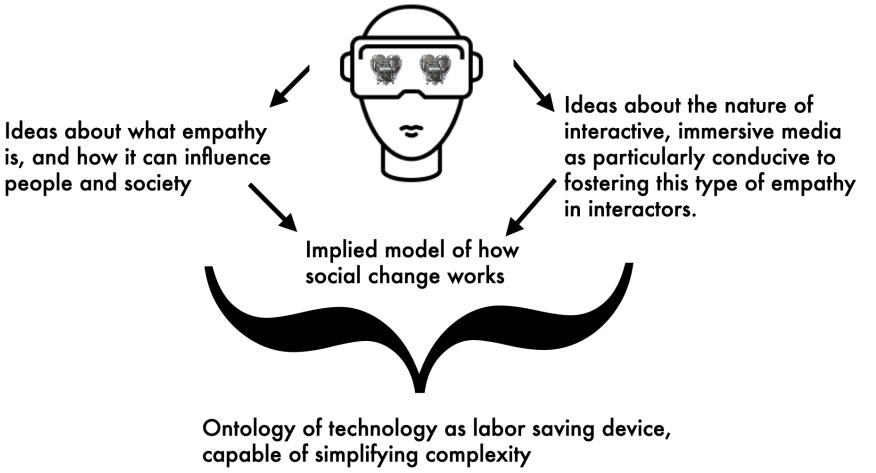

Figure 2. Diagram showing the layers of assumptions embedded within the empathy machine idea. Image credit: author.

This perspective on technology as an unproblematic labor saving device fits well with so-called common-sense but wrongheaded ideas about technologies as neutral tools (see Myth #1) that can smoothly and easily take on the burden of labor from humans and increase efficiency. This idea has been notably critiqued by Langdon Winner but also many other scholars of Science and Technology Studies such as Bruno Latour (1996) and Susan Leigh Star (1999), and even famously lampooned by satirist Rube Goldberg in his wild and improbable cartoon contraptions, published in newspapers a hundred years ago (Wolfe 2000).

The supposed ease of immersive and interactive tech for social change can be very compelling, particularly when compared with other methods for prejudice reduction, such as in-person intergroup dialogue training, which require many resources (mostly trained practitioners and teachers, people who must be paid) and quite a lot of time—even years. The technological fantasy of the immersive media empathy machine imagines a mass medium that can seamlessly reach scores of individuals, necessitate no actual interpersonal contact with the 'others' these individuals seek to empathise with, and smoothly and easily change minds in minutes. Unfortunately, these foundational ontologies of both technology and social change embedded within the empathy machine idea are at odds with key concepts in scholarly research on

social change. It turns out the media artifacts produced within this imaginary are more likely to serve to assuage the privileged person's guilt and enrich the artefact's creators (through money or social capital, or both) rather than effect true social transformation.

Next, we can examine: What exactly is empathy? Is it an emotion, a media-induced response, a personality-based positioning, or something else? There is a wealth of scholarship on empathy, and related phenomena such as compassion, identification, and transference. Steve Larocco's research provides an important perspective on the ethical complexity of empathy, which is relevant to our discussion given the focus on social change. Larocco understands empathy as a type of positioning of the self towards the other, as opposed to an emotion or feeling. Larocco writes: "[...]empathy is an orientation to the other, one that attunes to some aspect of the other's feelings or emotions or thoughts [...] yet which may not engage with the other's otherness at all. [...]To put the point succinctly: feeling-with is not the same as feeling-for. [...] Empathy, for ethical behavior, is a crucial intersubjective vocalizer, but by itself as an orientation it may not direct the better angels of our nature to direct action." (Larocco 2018, 3). Larocco here underscores the uncertainty around the potential of this empathic positioning, as there are many possibilities along a spectrum, all the way from authentic identification with another to selective empathy that seeks to misconstrue the other as similar to the self, or identifies only with aspects of the other perceived as similar to the self. Larocco points out that due to this wide range of empathic responses, it is a mistake to draw a causal relationship between empathy and compassion.

Philosopher Paul Bloom's 2017 research further critiques empathy as a dangerously ambiguous compass for moral decision making. Bloom points out that studies of empathy are based on individuals identifying with other individuals, but not situated within the large social contexts that surround us all and make actual social problems complex. Bloom also reminds us of the uneven legacy of empathic artifacts in spurring social change that advances justice. He notes that while novels such as Dickens' *Oliver Twist* and Beecher Stowe's *Uncle Tom's Cabin* have been cited as helping to motivate social change, they also misfire badly in many ways, exploiting and appropriating those who they hope to support. And, we must also remember there are counterpart works of social significance that have advanced causes furthering oppression

and domination through empathy, such as Ayn Rand's novels, in which the reader is encouraged to empathise with beleaguered protagonists who struggle to fend off others characterised as social spongers and degenerates, to rise above, victorious. Certainly, these empathic artifacts have also functioned as their creators intended, inspiring many to join oppressive and violent causes.

Coming back to look at interactive and immersive media more specifically, consider one of Chris Milk's most famous works, *Clouds Over Sidra*, his 2015 VR documentary about the Syrian refugee crisis falls. Milk promoted the VR experience as successful due to the medium's ability to fill the viewer's field of view, thus creating a virtual sense of presence for the viewer, who feels as if they are co-located in a Syrian refugee camp with the film's protagonist. However, this conflation of simulated co-location with empathy and social change has been astutely critiqued by many[4], who have noted that while VR may virtually place the viewer in another space, the viewer is still themselves, with their own subjectivity and positionality. Other peoples' consciousnesses are not simply 'other spaces,' and of course the 'as if' of VR is not at all the same thing as the lived reality of fleeing to a refugee camp. The VR viewer can simply remove the HMD when they tire of the experience; leaving a refugee camp is more complex, difficult, and dangerous by many orders of magnitude.

This notion that merely by entering an interactive and immersive simulation of another person's environment you can understand their perspective has insidious effects even for well-intentioned viewers. In the case of white viewers seeking empathy with the perspectives of people of colour, there is a long, racist history of whites donning Blackness that must be considered. The ongoing legacies of minstrelsy and blackface persist, as does the equally misguided impulse toward what Alisha Gaines (2017) describes as cross-racial identification, with seemingly well-intentioned white people seeking to become 'black for a day' to advance their own personal understanding of racism. Gaines' research highlights that even when whites may approach such an ill-advised project with the aim of advancing social justice, this outcome has yet to materialise from these types of appropriative, invasive moves.

4 See Clune (2016) for a good exemplar of this critique.

In the end, the people who benefitted most were the white impersonators, both monetarily and in terms of social capital. This type of instrumentalised empathy functions in the same manner as the colonialist rhetoric of extraction, allowing the white oppressor to mine a Black other for value, knowledge, and power.

So how does social change happen? Next, we will examine scholarship on the nature of social change, its many actors and processes, and discuss what role, if any, immersive media can play. Just as empathy is complex, so too is social change. Two major camps of thought could be described as the prejudice reduction model, and the collaborative social action model. The scholarship on prejudice reduction dates from the post Second World War era and centres on individuals in society who hold positions of power and prejudicial opinions about those they oppress. The focus in this scholarship is on reducing prejudice among these individual actors by providing corrective information that counters negative stereotypes. The aim is to reduce conflict and mitigate harm (Devine & Levine 2012). A second camp of research on social change focuses on coalition building and intergroup relations, with the aim of facilitating collaborative social action. The focus here is the disruption of existing systems and structures, which may indeed necessitate conflict, and even, in some cases, violence (Wetherell 1992/2012). Both models of social change are necessary, with focus at times on individuals and the mitigation of harm, and at times on coalitions and the overhaul of systems, but the question is how to balance these two perspectives. Sociologist Bobbie Harro's scholarship (Harro 2018; Harro 2018) provides a useful discussion and graphic model of how these two perspectives on social change (prejudice reduction and collaborative social action) can operate in confluence.

In Harro's cycle, the process of socialisation is described as: "systematic training in 'how to be' each of our social identities throughout our lives" (Harro 2018, 27). This cycle represents "how the socialisation process happens, from what sources it comes, how it affects our lives, and how it perpetuates itself" (Harro 2018, 27). In Harro's model, we see that media participate as just one node among many, and function in aggregate - not as individual media artifacts. This is because a research-based theory of social change includes no evidence for a single media artefact's impact. As Harro's model depicts, media participate

as just one node among many in the powerful forces of socialisation that work to instruct us, from the youngest age, as to how we should behave to maintain the status quo in social structures of power. Harro also provides insight into how oppression may be disrupted through a second model, the cycle of liberation, opening up opportunities (but not guarantees) for shifts toward social justice.

Harro describes the Cycle of Liberation as follows: "It is important to note that one can enter the Cycle at any point, through slow evolution or a critical incident, and will repeat or recycle many times in the process. There is no specific beginning or end point, just as one is never "done" working to end oppression" (Harro 2018, 628). Harro goes on to discuss the nature of liberation in candid terms, framing the subject in a way that is necessary albeit uncommon in academia, by acknowledging a larger sense of humanity and spirituality: "Liberation is based in something far bigger than me as an individual, or us as a coalition, or our organisation as a community, or any one nation, or any particular world. It's about the force that connects us all to one another as living beings, that force that is defined differently by every spiritual belief system but which binds us by the vision that there can be a better world and we can help to create it" (Harro 2018, 634). These are not conversations we may be used to having in a design lab, or in the design classes we teach, but if social change is the goal, if liberatory transformation and justice is the goal, these conversations become crucial.

Again, Harro's models conceptualise media as just one node among many that work in collaboration and sometimes opposition to shift any one individual's attitudes, beliefs, and actions. There is no research showing that it is possible to use a single technology, let alone a single media artefact, to circumvent the complex and arduous labor of the cycle of liberation. So how do media participate in these cycles of socialisation and liberation as described by Harro? While a single media artefact functions as just one node among many, the role of media in aggregate is still significant. Even media that are not explicitly designed to teach or persuade will carry some embedded values of the society they are created within, and therefore do the important work of reinforcing dominant narratives.

Dominant narratives are not necessarily bad; for example, 'treat your

neighbour as yourself' could be considered a dominant narrative that encourages pro-social behavior and even kindness. Other dominant narratives, however, include oppressive ideas that target marginalised groups such as women, trans and non-binary people, people of colour, people with disabilities, people struggling in poverty, and immigrants. These oppressive dominant narratives reinforce negative stereotyping about these groups and function to maintain or even worsen these groups' marginalised status and hamper access to power. But within media at large there are also examples explicitly designed to teach, persuade, or even coerce. We might discuss this subset as 'persuasive media.' Communication technologies, broadly understood as encompassing speech, books, images, and mechanical and digital technologies have long been implemented in service of persuasion. Some of these efforts have proved successful, others have not. Often it may be difficult to disentangle one media artefact's role in a large social shift and determine the precise ways in which it may have helped or hurt a particular cause. Some of the most persuasive media artifacts that have successfully instigated or cemented social change are understood as propaganda.

An illustrative example is Leni Riefenstahl's 1935 Nazi propaganda film, *Triumph of the Will*. Watching this film alone will not convince you to become a Nazi, but if you are already a Nazi it will help to cement and celebrate those beliefs and attitudes. Watching it while steeped in a culture and mediascape that also celebrates and normalises the values of National Socialism might indeed convince you to join the cause, particularly if other nodes in the cycle of socialisation such as friends and family members have already bought into the ideology. How media are received and interpreted by viewers has been the subject of study of many fields for more than a century, from Psychology to Communications and Cultural Studies. Of particular importance are Stuart Hall's theories on reception that recognise the creative agency of the viewer in the interpretive act (Hall 1973). While Hall's focus was mostly television, his perspective remains relevant for understanding media reception today.

The core of Hall's reception theory describes a range of possibilities for the viewer as part of what Hall terms the encoding/decoding process of communications. While media creators seek to encode mes-

sages in their artifacts, viewers engage in a decoding process to interpret these artifacts. Hall describes three broad types of decoding that viewers may participate in, even shifting between modes at times. These reception modes are: *dominant/hegemonic* (in which the viewer accepts the canonical or intended meaning encoded in the artefact by the creator); *negotiated* (in which the viewer accepts some parts of the canonical message but takes issue with other aspects); and *oppositional* (in which the viewer disagrees with the canonical message and/or may creatively appropriate and re- interpret intended meanings to shift them to fit their own value system). Hall's framework is valuable for designers to consider in order to avoid underestimating the agency interactors have in the act of interpretation. But social change requires that we look beyond individual reception, because social change, after all, must happen in the realm of the social—in other words, with other actual humans as opposed to mediated representations of others. Acknowledging the co- constitutive nature of the social, it is necessary to discuss an aesthetic and reception mode that centres relationships and communication between multiple humans. Dialogue is a good possibility for this and may provide a way forward as an interaction mode that has potential to foster conditions necessary to enact social change.

Dialogue, as described by David Bohm, functions in many ways that are opposite from persuasive media (Bohm 1996). As a communication practice that is distinct from discussion or debate, dialogue prioritises active listening, attention to process, and questioning for understanding. While a dialogue is often established within a framework of co-designed guidelines, these guidelines are not rules and may be changed as participants' needs shift and emerge. Unlike a game, a dialogue has no winners or losers, and as Bohm states, "Everybody wins if anybody wins. There is a different sort of spirit to it. In a dialogue, there is no attempt to gain points, or to make your particular point of view prevail. Rather, whenever any mistake is discovered on the part of anybody, everybody gains" (Bohm 1996, 7).

This dialogic approach is very different from what we see in interactive VR narrative experiences like Nonny de la Peña's *Hunger in Los Angeles* (2012) and *Out of Exile: Daniel's Story* (2017). These types of projects have so many layers to unpack, revealing these works actually function to re-inscribe the oppression they claim to push back against.

Beyond the aesthetics and ontology of the particular technology and underlying assumptions regarding the empathic mode of reception, there is also the ethically fraught issue of telling someone else's story, no matter the medium, as has been discussed by many scholars, such as Shuman (2005), Parvin (2018), and Rouse (2019). In the realm of nonfiction, as all the examples from de la Peña and Milk are, this issue is particularly charged. These projects are rife with serious missteps such as the taking of voice as opposed to giving it, cultural appropriation, and colonising moves to extract things of value from the oppressed. These problems are particularly highlighted in the case of others' stories of pain, oppression and violence, when the designer and interactor are not part of the community experiencing these horrors.[5] This extraction and remediation as safe simulation can provide viewers with a perverse sense of pleasure in the suffering of others, even if that pleasure is construed as morally 'good' in the name of providing information for the aim of prejudice reduction.

Disturbingly, empathy has also been explicitly instrumentalised as a design tool. This has been done to make the design process more efficient and easier for the designer, by providing the designer with a more seamless way to access the other, who is being designed for as opposed to being designed with. The commercial design firm IDEO has published a set of cards intended to assist designers by sharing approaches and methods. One such card is the 'Empathy Tools' card, which describes the shallow, appropriative methods used by the designers to claim access to the subjectivities of potential users of their products who are disabled. The card describes the method as follows: "HOW: Use tools like clouded glasses and weighted gloves to experience processes as though you yourself have the abilities of different users. WHY: This is an easy way to prompt an empathic understanding for users with disabilities or special conditions. IDEO designers wore gloves to help them evaluate the suitability of cords and buttons for a home health monitor designed for people with reduced dexterity and tactile sensation"(IDEO 2003).

Similar to the well-intentioned but ultimately racist and misguided moves by white people to experience empathy for Black people by

5 For a further discussion of these issues see Baker (2015) and Fisher & Schoemann (2018).

'blacking up' themselves, researched by Alicia Gaines mentioned above (Gaines 2017), this instrumentalisation of empathy as design tool suggests the designer can access the experience of disability in a meaningful way by putting on a pair of gloves or glasses. This reduction of disability to a single mechanic, like the reduction of Blackness to skin colour, and the refugee experience to (virtual) presence in a location, all rest on twisted notions of empathy, technology, and social change that have little basis in scholarly research or reality, and notably also fail to take into account the designer's own positionality. This brings us to the final myth..

5. Myth #4: The Designer is Invisible

Our final myth, that the designer can or should be invisible, can show up in pervasive design tools like 'user stories' and 'personas' or 'player types' that seek to conceptualize the user, but not the designer. The designer is left out of these frameworks, and this absence reflects assumptions around designer abilities or desires for scientific objectivity, neutrality, or even invisibility. Instead of seeking invisibility, we as designers we must find our own place in the conversation, and only after that, connect with others, and then finally consider technology. This means designers must first work to cultivate critical self-awareness and understanding of their own positionality as always already culturally and politically entangled. This self-knowledge is necessary as a foundation to be able to critically assess how one's own creations participate in the cycles of socialisation and/or liberation.

Being aware of one's own positionality as a designer becomes particularly important if we are going to engage in telling the stories of others. Working in interactive forms today, we need to keep in mind that even non-interactive forms already exhibit a complex relationship between the promises claimed for their narratives regarding empathy and justice, and issues of power and entitlement in the manner of their telling. Think for example of the many recent discussions on social media regarding which actor is entitled to play a marginalised character in a film, when the actor in question does not share this marginalised identity in everyday life. In terms of the strategy of 'giving voice' or practices of speaking for others, Linda Alcoff has provided incisive analyses of these impulses as too often glory-seeking, exploitive, and colonising

(Alcoff 1991-1992). So while the promise of empathy or justice as an outcome of narrative in general, and with interactive and immersive tech in particular, is exciting, it must be tempered with careful and critical consideration. Nassim Parvin's paper on doing justice to stories also provides a much-needed critical examination of the claims made for digital storytelling as a medium for social justice, and makes a similar call to designers to recognise that "what matters most is not giving voice but rather a renewed attentiveness to the act of listening" and that we "(re)consider the practices of storytelling and listening as dialogic"(Parvin 2018, 527-528). In order for us as designers to acknowledge that listening is important, we need to engage with a meaningful form of listening that is reciprocal, such as active listening, which again highlights the need for the designer to bring critical awareness of themselves as a presence into the design process. So what could this kind of design process look like?

6. Design Take-Aways: Moving Past the Myths

Now I'll share some design frameworks with you from my own research that I hope will be helpful take-aways for your toolbox as scholars and designers. First, I offer a set of questions to consider when you are designing (see figure 4). These questions are not a way to fool-proof the design process or guarantee success, but rather intended to expand the purview of what the designer considers.

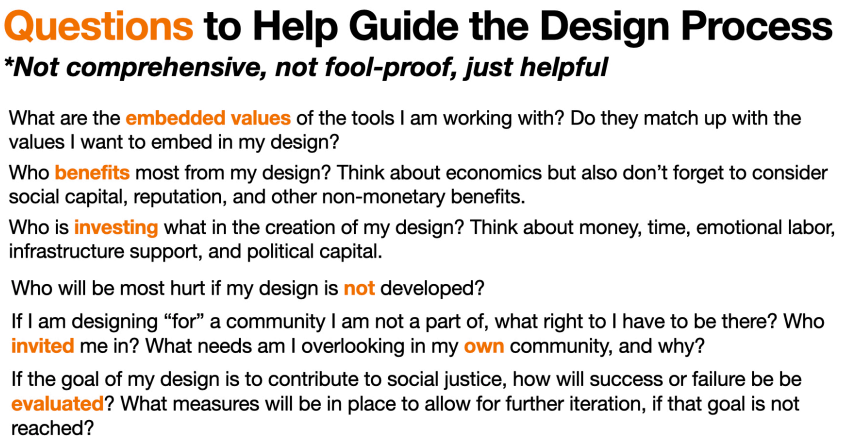

Figure 4. Questions to Consider. Image credit: author.

And in Figure 5 you will see a way of thinking about design anchored

by a set of dichotomous qualities that are intended to help us think towards an anti-instrumentalist design approach. This approach is centred on dialogue as opposed to any particular media technology, and prioritises human-to-human interaction as opposed to simulation. Notably, the qualities associated with human dialogue are counterintuitive for many design processes. The process of dialogue is not quick, its outcomes are not disposable, its work is never finished, and it is not productive in the capitalist sense nor easy to monetise. This approach can be, however, transformative, as opposed to informative.

HUMAN DIALOGUE	MEDIA SIMULATION
Not efficient, requires considerable labor and time	Efficient, labor-saving, quick, fast
Outcomes are not disposable (you can't un-know what you learn in dialogue)	Outcomes are disposable, can become obsolete, may even be designed to include planned obsolescence
Not interchangeable	Every interactor access the same core experience
Not productive in the capitalist sense	Productive and able to be commercialized
Never finished	Discreet
Characterized by intimacy	Characterized by performativity
Necessitates risk, discomfort, and conflict	Provides comfort and safety
Shares agency among participants, de-centering power	Continually re-asserts authorial and system control over participants through the absence of or contstraining of choices, even while under the guise of interactivity
Transformative	Informative

**The qualities associated with human dialogue are counterintuitive for many design processes.*

Figure 5. Dichotomous qualities of design processes and outcomes that are centred in dialogue (left) and in media technology (right). Image credit: author.

If we do choose to base our design process on a dialogic ethos, what would that design process look like? What steps should we take? Figure 6 provides a road map (See Figure 6). Executing all of the steps outlined here takes several years, not weeks. Most designers start with Step Four, and many of the projects developed in this truncated manner have very limited impact, providing informational, but not transformational experiences. Interestingly, when working through a dialogic design process, the people most impacted by the project may be those community members who you invite into the co-design process with you, and not the so-called "end users." So the most valuable part of this kind of design may be its process, not its product. And that is also a dialogic way to think about design.

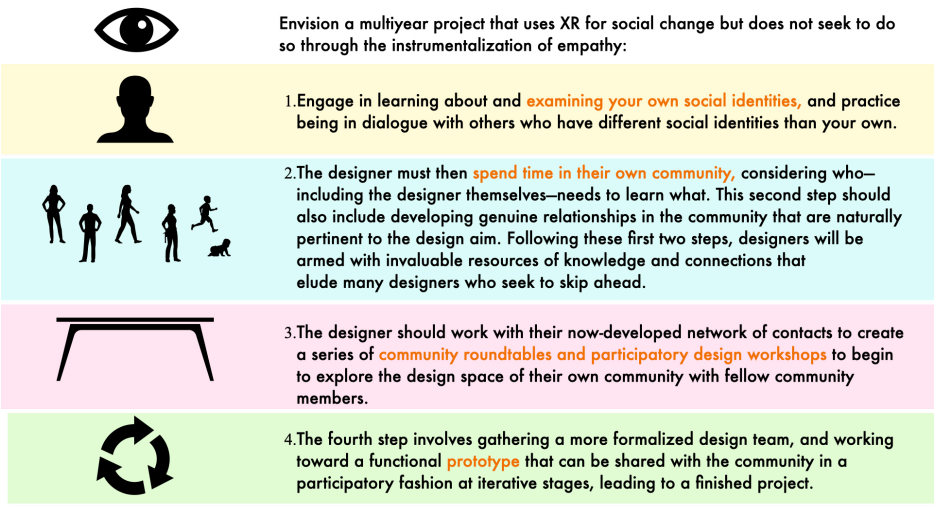

Figure 6. Example of a dialogic design process. Image credit: author.

This is the crux; if ethical design and social transformation are our goals as designers, if we hope to build a better future, we must seek methods that truly transform both ourselves and participants through co-constituted, consensual, collaborative means that result in transformational knowledge production and meaningful experience. Continuing to cosset ourselves and our interactors in simulation can only result in the perpetuation of systems of oppression.

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Chapter 2

Postcolonial Threads in GUX: a Conversation

Björn Berg Marklund,
Souvik Mukherjee &
Amit Goyal

Abstract

Videogames have a long, and complex, relationship with "non-Western" countries. Game narratives and ludic symbols are fraught with implicit, or explicit, imperialist history and ideologies. In some games, such as *Sid Meier's Colonization*, the connection is fairly obvious. But a game doesn't have to be *about* colonization to present a colonialist narrative. Souvik Mukherjee is a game researcher at the front of a growing discussion on this topic. In his work, he analyses games from different perspective (media analysis, philosophy, and sociology) to present a holistic understanding of the way games represent, and constructs, different cultures, people, political systems, ethics, and societal issues. This chapter is an edited transcript of an interview with Souvik, where we talked about everything from his academic work, to how he modded *Age of Empires* in his childhood.

Keywords: postcolonialism, western game development, orientalism

1. Introduction

This chapter is a bit unusual, since it's an interview with a researcher who has been part of the GUX program through a guest lecture and workshop. In this interview, we discussed contents of his lecture and

his book *Videogames and Postcolonialism: Empire Plays Back*, but also his favourite games, his experiences being a game researcher in India, and the future of postcolonialism and game research. Amit Goyal, a game developer and student, also participated in the interview – both as an interviewer, but also as a participant as the discussion delved deeper into game development, the Indian game community, and India as a game market.

2. The Interviewees

Björn: So, how would you describe yourself, and you as a researcher?

Souvik: I am a games researcher from India, with an interest in narratives and storytelling in games. I've been working on video games and storytelling since about 2001, which is fairly early on – even in broader game studies terms. I completed my PhD in 2008 from Nottingham, on video games and storytelling. My thesis later got converted into a monograph, called *Reading Games and Playing Books*.

Since 2011 I've been in India and I've become increasingly interested in postcolonialism, because I started seeing that it was a really underrepresented topic in game studies circles at the time. So, I've kind of focused on issues of colonialism, representation, diversity, and inclusivity in games.

Very recently, I have more shifted my focus towards board games – looking at how board games *transculturate* from the Indian subcontinent, or rather the *colony*, to the metropol, and to the UK and the US, and so on. And, how it came *back*.

For example, if we take a game like Ludo, which originated in India, and then went elsewhere, and came back to once again "become" Ludo in a different way.

So, in a nutshell, that's what I do.

Amit: And I'm from New Delhi, India – and I used to have a small indie studio that I ran from there for about 8 years. Then, I moved here to Sweden last year to study, and I now work for an indie studio here.

Souvik: I actually wrote a bit about your studio in my book, Amit! It's

about the evolution of the Indian game development community. You're the second Indian developer I know who moved to Scandinavia, too.

Amit: Oh, is the other one [name]?

Souvik: Yes!

Björn: That's kind of crazy that you both know of each other, and know the same people, without really talking to each other before. Is that mainly because the Indian game community is pretty small?

Amit: Yeah, it's very small, everyone who works with games know each other.

Souvik: Yes, until very recently I think I was the only researcher with a PhD that worked with video games at all, really. Thankfully, now, there are many more, which is really heartening! But I can safely say, that 5 years back... actually 4 years back, I was the only one. You can narrow the timeline down that much.

3. What is postcolonialism in games?

Björn: When you're talking about postcolonialism in games, what does that entail? What's its origins, and what new perspectives do you think it brings to our understanding of games?

Souvik: Well, the first thing to point out is that there is no hyphen in "postcolonialism." Many people look at it like post-colonialism, but we're not really talking about something that happens *after* colonialism. It's actually a critical framework that looks at responses to colonialism, and criticisms of it. And that happened *during* of the periods of colonialism, as much as it does now. So, it's about the responses to colonialism, and it's just about understanding how one can look at the world, in particular from the perspective of what can be described as the "other" - by the ones being othered by the colonial state.

I should really mention some of the foundational works on this subject, since there's a lot of different perspectives to approach it from. I would say Edward Said is one of the more famous ones, and he has

written extensively about the notion of 'Orientalism'. In his work, he talks about how the West actually c*onstructed* a particular image, or figure, of the East. He details the processes and concepts behind how Western countries describe certain countries in the "orient" in a sort of mythical way in or der to construct the "East." So, the model of a continent becomes constructed by colonizers.

But the discussion is not as simple as "colonialism vs postcolonialism", there are many other factors to it. There's the work of Gayatri Chakrovorty Spivak, who writes about the 'subaltern'. And, more recently, we have theorists like Walter Mignolo and Aníbal Quijano who write about the '*d*ecolonial' – what happens after the crisis of colonialism.

3.1 The current state of the dialogue

Björn: With all this work having been done on these topics, you still mention in your book that the topic of postcolonialism is definitely underexamined in games research. Is it that these terms are *relatively* recent – or is it that the field of game studies is uniquely behind the curve?

Souvik: I think games are far behind, really. Game studies certainly has a fairly long history at this point... it started quite far back with several theses on the topic of games, before some of the key texts like *Cybertext* and *Hamlet on the Holodeck* was published. These early texts rarely mentioned issues related to colonialism, or those types of histories, as a component of games at all. But postcolonialism, as a term, has definitely existed for the entire "lifespan" of game studies, it just hasn't been taken into consideration.

Postcolonialism as a concept isn't new, and other concepts relating to them aren't really that new either. Again, if we talk about the "decolonial", which is about how knowledge production is being unentangled with the European epistemic. All of that has been there for a long while, from the 50s and 60s and onward. But, during the time I wrote my book, and during my time working with games I couldn't see these types of discussions. The absence of the discussion was actually quite striking.

But, as I mentioned, thankfully that is starting to change now.

Björn: Yeah, and here I'll return to your book again. you mention specifically in your book that "Despite early depictions of colonialism in videogames, such as *Sid Meyer's Colonialization*, and Microsoft's *Age of Empires* there has been very little scholarship on colonialism". So, it's been there in plain sight in game content – but not in scholarship? Why do you think that is?

Souvik: Well, I think... and this is maybe going to be a bit... disturbing, in a sense. But it relates to what code is like. There have been a lot of recent writing about how coding and allegories, are all fundamentally Eurocentric. I'm actually about to teach a course called "Colonial Coding", which focuses on the shape of modern codes.

Coding doesn't always relate to *literal* programs. I remember last time we met, you showed me a Swedish board game for kids – *Jakten på den försvunna diamanten* – which is about "finding" the Star of Africa and bringing it back home. You pursue this game goal, and the game doesn't take anything other than the players and their goals into consideration. The continent, or the people – the 'subaltern' – don't really exist, or speak, in that game. So, that type of coding is common in many different types of games.

Björn: Just to expand on this further. If we do look at *literal* game code, are these issues present there as well? Or is it primarily a matter of allegorical code?

Souvik: I meant that, as well. Code is a way of thinking, and of structuring a certain kind of logic and flow of information... Game programming, and game engines, are tied to a very European epistemic, and it often expresses itself in subtle ways. Even if it's a mathematical system – which might *seem* neutral or unbiased – it's still based on a particular kind of logic.

Björn: I guess, for me, it's hard to think *outside* the European epistemic since that's all I know – do you have any examples of those other logic systems?

Souvik: One example is that, before the conquistadors arrived to the Andean region, the people had a "calculator" called the 'quipu', which was a collection of strings that would be tied into knots according to

different "algorithms" to keep track of calculations. The Quipu actually lasted for quite a while, even after the conversion of the country to Christianity. But it has since essentially fallen out of existence. How it actually functioned is still up for debate.

I'm referring to those alternative ways of thinking, and of calculation. Different ways of thinking about space and figures, numbers. I mean, coming from India, I'm sure you're aware of the Indian systems of mathematics that go back for millennia, and that function in ways that are "alternative" to the Western epistemic.

So, even though it might feel very abstract, and since it's hard to imagine other ways of looking at things fundamental to our own way of thinking. I would say that this is a different type of "code", and it's important to understand this history to trace how current code has taken shape, and how it subtly affects how we construct games.

4. Portrayals of colonialism in games

Björn: Before we started our conversation, we had a brief talk about a trailer for *Civilization 4*.[1] Is there anything in particular that you think is "typical" for games made in that particular era (late 90s, early 00s)?

Souvik: Well, it's complicated. For one, I don't think it's about that specific era – it's still how many games tend to look for me. If we look at *Civilization 4*, there are attempts to at least address, or at least somewhat *acknowledge* colonialism and the issues around it in some ways. But these games also very often fall back into *glorification* at times. I think that's the most common ways this gets expressed in games. Whether it's deliberate or by accident, it very often goes from acknowledgement of a bitter history, to glorifying it – either implicitly or explicitly.

Björn: So, "bringing it up" and "celebrating it" becomes a pretty difficult line to walk?

Souvik: To turn to something less historically anchored, even games like *Mass Effect: Andromeda* has a colonialist narrative. Scholars would

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1 In this trailer, set to Christopher Tin's Baba Yetu, you see brief scenes from human history, many of which involve some form of imperial expansion - for example the arrival of Europeans to America and encountering native americans

shudder to think about the construction of a game like that. It's literally about the colonisation of an entire galaxy. Those types of elements are so prevalent.

But then there's the more obvious ones like *Age of Empires*. Or, *Empire: Total War*. How these games work, and how they are meant to be played, there's an unavoidable *code* there. The player is expected to, kind of, follow a certain program or algorithm of problem solving.

Björn: In your book, you specifically point towards *Assassin's Creed*, and *Far Cry*, as examples of games that somehow acknowledge or tackle colonialism. Do you mean that in a positive sense?

Souvik: I would say that *Assassin's Creed* - at least some of the games in the series, in particular *Freedom Cry* or *Syndicate* - makes some important and quite delicate points about colonialism.

But sometimes they also lapse into very commonplace colonialist notions, in the stories and gameplay. *Freedom Cry* has the mechanic where you free slaves, for example. At face value that, of course, is good. But, in terms of actual gameplay freeing the slaves is just a way for you to improve your gear. So, freeing slaves become a type of currency, and ends up rewarding a capitalist narrative. It doesn't give the slaves much of a voice, they're mostly just game pieces.

Björn: So, where do you think the line goes between someone appropriating these issues for their narratives or gameplay, and someone wanting to discuss and critique them?

Souvik: I think *Assassin's Creed*, overall, does it well. I think there's this fantastic – well, I think it's fantastic, I'm certain many would disagree – DLC for *Syndicate* that is about the last Maharaja of the Sikh Empire, Duleep Singh. He was exiled to the United Kingdom, and the game tackles the issue of colonialism, exploring the experiences of being exiled and losing your own country.

I think that is an example of wanting to actually discuss these issues, and show them to players. I think there are many games that do want to discuss these issues. I think it shows a lot of promise.

Björn: Do you think it's just a coincidence that both *Far Cry* and *As-*

sassin's Creed of these games are from Ubisoft? Or, do they have a particular kind of skill with this?

Souvik: Well, actually I am currently writing an article about how Ubisoft actually very often gets history wrong.

Game developers care about history, and can be really good at portraying it in a wide variety of ways. But, the industry as a whole has a hard time going beyond traditional, often incorrect, views of history.

4.1 The "subaltern voice" in games

Björn: That, to me, certainly ties back into how you discuss the "subaltern voice" in your book. Since we're speaking of expressions through coding, do you think the technology - and how you have to adapt your "language" to game engines – excludes certain types of stories and perspectives in games?

Souvik: I mean, I'm sitting in India, and I have a Steam account. That means I can afford games on Steam, or it at least have access to a computer that can run games. But if we look at the poverty line in India, I'm certainly in a position of luxury in India. It's definitely debatable if I can speak for the subaltern.

But, having said that, even from this position of luxury in India, I would still say that there are elements in my culture, or my history, that games can't seem to capture. If we're looking at my own culture in India, in the portrayal of my own history, the culture has been "silenced" in a way. It has been *rendered* voiceless. It's not that my own history doesn't "speak", it's more about it not being heard. When my history is given a voice in big game titles, it certainly speaks with a noticeable "outsider voice." If a person only learned about India through games, what kind of picture would they actually have of the country?

We can look at the case of the notoriously aggressive and violent Nuclear Ghandi in the Civilization series. There is this urban myth that this was a bug – but lately, after I wrote my book, Sid Meyer has come out and said that it *wasn't* a glitch. It seems to have been kept in there as more of a joke. It might seem a bit harmless, but let's imagine a player that doesn't know about Ghandi. It might seem improbable, but they

will see a thoroughly wrong portrayal of this important person. That is an example of rendering someone voiceless, or using their voice in an odd way.

4.2 Playing colonialism

Björn: Just in general, what was it like growing up in India, being very into games? Did these types of odd things ever affect your enjoyment of some games?

Souvik: Well, I played a *lot* of Age of Empires as a kid. And when I was growing up, games were definitely seen as bad, or harmful, things in India. Even more so than in Western countries. So my mother would come by, look at all my catapults, and say that "the catapults were throwing rocks at her heart." So, growing up with games as a hobby was seen as pretty bad.

But what what's cool about Age of Empires was that it was a game where I could explore my own stories through modding. I didn't have to learn how to *code*, really. Most of it could be done with macro elements and scripts, and basic in-game coding, and the maps and map editors were there, and so on. And you could import a Raja or some kind of figure from a Civilization character – just someone who had a turban on. And there were camels and horses and other stuff, so I could use all of that, and make "India" more playable and powerful.

Björn: How does that relate to the act of "playing against the grain" that you mention in your book? The act of playing a counter-narrative to colonialism in a game *about* colonialism - is that what you were doing with your modding?

Souvik: Well, I was of course very young at that point and didn't think about things in those terms. But, my answer to that is that that wasn't really what I was doing. Some researchers look at someone creating an alternative history in a game, like a small country conquering the world, and see it that way. But my argument is that these types of alternative history creation, or counter-play, is essentially just replicating the logic of colonialism. You just happen to be the colonizer. Like, let me go conquer England in the game – it's still colonialism, right?

Björn: So, you're subverting *history* but you're not subverting the notion of colonialism?

Souvik: Exactly, I'm just writing a counterfactual history, but not rewriting the logic.

5. Game development and research in India

Björn: As we started this discussion, you mentioned that the Indian game community is really small. Building on that - what is the game community, or the experience of developing games, like in India?

Amit: Yes, we definitely don't have a big game community in India. A lot of that is due to it being a very expensive hobby. There are very few "home grown" games from India. But if we're talking about game development, it's very different from my experiences here.

I was attending a game conference that happens in India, and the constant pitch you'd see there was that "India is ready to explode!", once we've solved a few problems. The two biggest problems were bandwidth, and the second problem was how much people are willing to pay for games. That was about 8 years ago, and many of these problems have been tackled, or at least improved a lot. But we *still* haven't seen the "explosion" happen. I actually think it was mostly about a lot of the industry veterans wanted to attract more investments into the space.

There have been a few significant attempts, and I think there's now enough case studies for developers to see what doesn't work, on the Indian market. ZeptoLab, for example, tried to bring *Cut the Rope* by partnering with an Indian company – Nazara. And that didn't really make as big of a splash as it was supposed to. Then, there is another studio in India that bought the rights to the game *Japan Joyride,* developed by Half Brick. The game was *huge* on mobile back in 2013-14. They released an "Indianized" version of the game where they, sort of, put in a lot of Bollywood references and stuff like that. But that but game also failed to really take off.

Trying to understand the Indian market in the context of the Chinese market is a very bad way to go about things. Sometimes people talk about China and India as if they're the same type of market challenge.

But they're definitely not. The cultures are completely different, the demographics are different, and so on. I won't say China is homogenous, but I'd argue that it's a bit more homogenous than India. Just going from north to south, or east to west, India has a massive variety of cultures, people, and languages.

So, I think all those factors are what, sort of, holds back... I think us developers have sort of addressed the cultural aspects of games as a part of our society, but there are things still holding things back.

Souvik: To add to that, I remember that conference – and the main word I heard thrown around was *monetize*. Not *create*, not *design*, not *think*, it was always: monetize!

I used to be a judge on these conferences, looking at games from younger developers. I remember one year, where I was handed four *Angry Birds* clones. That was when Rovio was really big. So, this is what the whole idea of monetizing leads to, if you don't promote creativity and free-thinking development.

Björn: What was your experience actually working with games during these periods, Amit?

Amit: We were a really small team, so we did not have a lot of resources, and very little marketing resources. The way games worked in India back then [~8 years ago] was that it was exclusively business-driven.

The time we started making our games, we started with casino games since that's popular in India. That was financially clever, but we had absolutely no interest in it. We wanted to create something unique, and we wanted to make something with interesting mechanics.

So, we dabbled in making games for the Indian market, but the Western market makes more sense. There is more room on the international market for more variety, and more nuance, in games.

5.1 India and the international game community

Björn: While we're talking about that internationalisation, I have another question. If we're looking at the games industry – networking is so crucial. India is pretty remote from many of the biggest conferences,

did that affect your studio's development?

Amit: Well, *a lot* of networking happens at conferences. There are a lot of conferences that are really important events for developers – GDC, Nordic Game Conference, Pocket Gamer Connects, etc. But, they're really expensive. For a small studio as ours, any trip like that would need to have a really, really, really specific important motivation behind it. We had to know that it would lead to some kind of cash-flow, that we'd at least be able to pay for it.

The people you get to interact with becomes really different. We did not get a lot of contact with international designers, developers, or publishers, or anything like that. For us, as a studio that had international ambitions, we had a severe case of FOMO about all that.

And it's a totally different scene over here. A studio I've been working with is currently talking about going to GDC like it's nothing. And they're also a startup! It's not like a huge company, but for them it's not a big deal. For a similar company in India, it would be completely impossible. So, access is a big issue.

Björn: Do you have similar experiences as an academic, Souvik?

Souvik: Yeah, it's just like with Amit's situation. It's hard to attend conferences in general. Attending a conference in Europe or North America can be equivalent of two months' salary. So it's an access issue for us academics as well. That's a big part of why we've started DiGRA: India, we want to provide a more accessible way of networking and meeting other developers and researchers.

Björn: Some of the rhetoric that's been used in the past centred around a race to "conquer" the Indian market. Does that, in and of itself, represent some form of colonialism?

Souvik: I think colonialist would be a bit of a harsh term here. If the game industry was colonialist, in the strict sense, they would exclusively extract things from the country without giving *anything* in return. I see it as it's just following its standard process of monetization. It's just a general capitalist method, not colonialism – and it's an important distinction, just so that the conversation doesn't get muddled.

But, just like in their created game content, North American and European studios don't realize the immense heterogeneity of the Indian market.

Björn: So, what are some of the most common ways developers tend to fail in this regard?

Souvik: There are a lot of issues around creating games for India. When the rest of the word tries to make games for the market, there's just a bit lack of understanding of India – or there's a lack of *trying* to understand India. There's all this diversity in our country, that people just don't realize. One of the most common misunderstandings here is, of course, that it is very religious, which often expresses itself in games as "Indians don't eat cows."

I remember that Big Huge Games said that they had a really cool mechanic in *Age of Empires*, in that India wouldn't eat cows in the game, since Indians just don't do that. But Indians aren't *just* Hindus. I don't know what some people think, or want to think, but it's not just... well, secularism is written deeply into our constitutional documents. And if you look our population, and the population of Muslims and Christians, who would all eat beef, those blanket assumptions are just kind of stupid.

Amit: Yeah, and adding to that, the perception of India is that it is a vegetarian country. But, the majority of India are meat eaters, so those misconceptions are wide-spread and relate to all aspects of our culture.

6. The future of games research

Björn: In your book, you state that "it is only in the past 2 years that there has been a rise in game studies publications that begin to explore the postcolonial" – now your book has been out for almost 5 years, has anything changed since then?

Souvik: Oh, loads and loads! I saw parts of this in something I briefly contributed to, with Emil Lundedal Hammar from the University of Tromsø, which was an open access special issue on postcolonial perspectives in game studies. We had around 50 submissions for that

special issue – which was shockingly high, really.

We had to reject so many fantastic papers, because even if it was an open access issue, we still had our limitations. But having said that, there have been so many more articles on games and postcolonialism. If you go on Game Studies or any other journal, and look under tags of postcolonialism, you'll see so many articles discussing it.

Björn: Do you attribute that to something in particular? Is it society waking up to these issues in general, or something happening in game studies?

Souvik: I have no idea, really. It's probably a complex combination of things. I'm just happy it's happening!

Björn: What do you feel is a *promising* thing happening right now for games, or for players?

Souvik: Well, maybe this is a bit too broad. But, post GamerGate, there has been a larger discussion of inclusivity, and I think both developers and players are discussing these things more openly and actively.

New diversity initiatives are done at different studios, and in game conferences, which is a really good development. Another thing that helps a lot is that what we "count as a game" keeps expanding and changing.

Björn: What kind of changes do you see on the developer end of things?

Souvik: There is a noticeable increase in developers working towards giving a voice to, and actually representing, the subaltern. They are trying to represent people who cannot represent themselves.

This makes the notion of the subaltern increasingly relevant in video games. As we've talked about, there certainly are a majority of subaltern voices that cannot express themselves in games, but there are games that try to address it. A game like *80 Days* is a good example of this effort, and those types of games appeal to me a lot.

As I mentioned earlier, many game developers care about history, and I think we're seeing more and more examples of history being portrayed with more nuance and care.

7. Some concluding notes

That was, more or less, where our conversation (at least the one that still related to topic) ended. If you're interested to know more about Souvik's work – it's of course readily available online, and *Videogames and Postcolonialism: Empire Plays Back* can be a good starting resource not just to Souvik's work, but for understanding postcolonialism and its application to games in general. As a word of caution – this is one of those cases where "once you see it, you can't unsee it." Once you see the different codes and concepts detailed in the book, your way of reading games might be irreversibly changed.

Chapter 3

Understanding a Complex Inheritance: Measurement, Game Culture, Military Technology & Computer Science Legacies in GUX.

Rebecca Rouse

Abstract

This chapter is based on a set of my lectures from the GUX masters program Research and Development course, and provides an historical perspective on the complex interdisciplinary inheritance that Games at large and GUX in particular have received from a range of fields including: the history of measuring people; early game culture, which was focused on hunting; the development of simulation technology for military applications; and the history of the computer science discipline. These seemingly disparate threads share similar impulses in terms of positivist thinking and quantitative measurement, which have significantly influenced the field of Games today both as an academic discipline and as an industry.

Keywords: Games history, Measurement, Culture, Technology, Computer

1. Introduction

In his reflections on the 1936 Olympic Games, German cultural theorist Walter Benjamin reflected on the rise of precision measurement and statistics, and the impacts of these developments on how we play. Benjamin describes what he observes as a shift in how people are measured against each other in sport, moving away from competition be-

tween fellow humans, and instead toward "running against the clock" with an emphasis on precision measurement "according to seconds and centimetres." Benjamin identifies this shift as changing the fundamental nature and social relevance of sport, transforming it from a performative form into a "mechanised test" which he feels limits the social importance of sport (Benjamin, 1974; 1039-1040).[1] We see in this anecdote how deeply the history of the development of technology is entangled with games and the experience of play. Pushing back against rhetorics of the new that often dominate discussions of digital games, this chapter looks to both pre-digital and early computational examples to help illuminate some of the Games family tree.

While Games as a discipline is relatively young (the oldest undergraduate programs were established in the early 2000's) this short history has a long and important prologue, with threads through multiple disciplines and cultural arenas. While games can be understood as a complex art-science, this chapter focuses on the scientific, technological, and positivist pre-history of computer and videogames. Games also have an important art history, which is beyond the scope of this chapter but is well researched by Brian Schrank (2014). Understanding the pre-history of the Games discipline, industry, and pedagogy can help illuminate the reasons behind many of the current dilemmas in the field. These dilemmas include the prevalence of violence, misogyny, homophobia, ableism, and racism within commercial games and many games communities (ADL 2019; Denham, Hirschler & Spokes 2019; DePass 2018; Kocurek 2016; Ruberg 2019) as well as the sometimes narrow way in which the Games discipline is configured around a single technology as opposed to broader understandings of play in human culture.[2]

It is not by serendipity alone that Games both as a discipline and as

1 See also Gala, Eduardo Lautaro (2021) for a discussion of the impacts of cinematic technology on the way sport is played and observed.

2This is evidenced in the curricular configuration of many games programs, which have a vocational or industry positioning and proportionate emphasis on the learning of specific software packages and industry workflows as opposed to providing a broader education that deeply acknowledges the embeddedness of games (digital, analogue, and physical) in culture. Instead, the narrow category of video games or computer games are commonly centered as the focus of such programs, in alignment with the global games industry, as opposed to curricular centering of digital games as just one component among many in the larger constellation of human play.

an industry has arrived at its present state. There is a long history of entanglement in game culture (as in hunting), military technology, the history of measuring people, and the development of the Computer Science discipline that must be discussed. Through exploring these entangled, positivist histories we can see that games as objects and technologies, as well as game design practices and curricula, all have a long and complex shared inheritance from a past that continues to powerfully resonate today. As students and researchers, by critically reflecting on this complex inheritance, we can make more informed choices about how we move the field forward via our own participation in it, and think more creatively about the type of future world games can construct, and if that is a world we wish to inhabit. This chapter is organized into two sections, with the first focused on the history of measurement as is relevant to GUX, and a final section focused on the interrelated histories of game culture, military technologies, and Computer Science.

2. GUX and Measuring People

What do the wood known as lignum vitae, Napoleon's watch, and John Graunt's plague death tables from the 1650s all have in common? They are all key players in the development of how we measure people today. The history of science is deeply twinned with the history of measuring people. We revisit this past now, to unpack how and why we are where we are today, in terms of how people are measured, both by themselves and others, and why there are some difficult and problematic parts to this legacy that still impact work today. Following the Renaissance, we have the Early Modern period, which spans the start of the 15th century through the Age of Enlightenment in the 17th and 18th centuries, which lasts until the beginning of the Industrial Revolution in the late 18th century. This shift from the Renaissance to the Early Modern brings us the birth of science in the West as we know it today, and represents an important shift in how we understand knowledge and the world. The curiosity cabinet and the museum are good embodiments of this shift and help illustrate the different ways in which knowledge is configured (see Figure 1). Moving from the curiosity cabinet, as depicted on the left in a 1690 painting by Domenico Remps, to the image of the British Museum Egyptian gallery from 1847, we can see many differences. Two major shifts include the move from collection in the cabinet to classification in the museum, and the shift from private

access in the collection to public access in the museum.

Figure 1. The Curiosity Cabinet (Left; 1690 painting by Domenico Remps) and the Museum (Right; 1847 engraving of The British Museum: the Egyptian Room with visitors). Image Credits: public domain.

It is during the Early Modern period that the modern scientific method is developed, and more widespread (although still unequal) access to education is shared thanks to Enlightenment ideals. Importantly, the colonial politics of this time influenced the tools, techniques, and paradigms created, which we still find in the legacy of Games but also culture at large, of which Games is a part. It is to this time period from the 1600s through the 1700s, a period of roughly 200 years, that we owe positivist ideas that continue to dominate today such as: numbers as signifiers of knowledge; distance is a signifier of objectivity; and the notion that technologies of objectivity provide access to truth. These ideas are reliant on an underlying assumption that all of human experience and culture can be mathematised, and that science has no need or ability to reflect on itself and its methods, since it is the embodiment of truth. This ontology paved the way for the development of many systems and structures still with us today, such as corporate health insurance. The corpus or body of importance in this case is not the individual human body but rather the corporate entity. This perspective is tied to the values of the scientific revolution and the change in medical training that resulted, emphasising professionalisation and a distanced, depersonalised stance for the practitioner regarding the patient. Max Horkheimer and Theodor W. Adorno discuss this perspective as follows:

> Science stands in the same relationship to nature and human beings in general as insurance theory stands to life and death in particular. Who dies is unimportant,

> what matters is the ratio of incidences of death to the liabilities of the company. It is the law of large numbers, not the particular case, which recurs in the formula. Nor is the concordance of general and particular concealed any longer within an intellect which always perceives the particular as a case of the general and the general only as the aspect of the particular by which it can be grasped and manipulated. Science has no awareness of itself; it is merely a tool. Enlightenment, however, is the philosophy which equates truth with the scientific system. (...) The notion of self-understanding of science conflicts with the concept of science itself. (Horkheimer & Adorno 2002, 66)

It is interesting to see that these ideas, while commonplace in Western culture today, are not innate or natural, and that in the much larger history of humanity, are relatively recent notions.

In the development of the natural sciences, anthropology and then ethnology were also developed during the late 1700s and into the 1800s[3]. These are sciences of watching other people, measuring and classifying them, in many cases to render those who are observed useful to the state, which at that time is often a colonial power. By the 1800's people were under observation at times not only by researchers, but also by the public, as part of the Enlightenment ideals of public education. For example, we can look to anthropological displays from World's Fairs and Expositions which commonly included racist displays of colonised peoples, using invented racialised hierarchies to justify colonisation and maintain the myth of white supremacy. As part of the Enlightenment's widened access to education, public participation in these displays can be seen as an origin point of armchair anthropology and citizen science.[4]

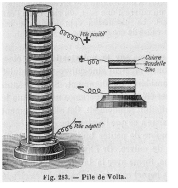
While this widening of access to education did indeed help bring opportunity for learning to new groups of people, such as white women in the middle class, many were still left out, such as people of colour and people in poverty. In addition, education often functioned to pass

3 For an extended examination of the history of anthropology, see Thomas Holland Eriksen and Finn Sivert Nielsen. (2013).

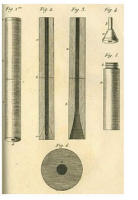
4 For more on the history of the display of peoples at fairs and expos, see Fanny Robles (2014)

on embedded colonial values and emerging capitalist ideals like meritocracy, working to justify the absence of those not present in the classroom. Through the development of the natural sciences during this Early Modern period, we see the observation and measurement of people become augmented and aided by tools, techniques, technologies, and machines of the scientific revolution. A range of examples are pictured in Figure 2, including the early microscope, battery, stethoscope, caliper, spring scale and cyanotype (see Fig. 2). Many of these examples have embedded values based in ableist ideas about "average" bodies and "normal" capabilities,[5] a topic we will return to later in this chapter.

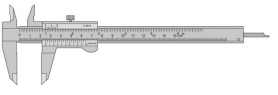
Hooke's microscope (1665/1670)



Voltaic Pile early battery (1796)



Laennec's Stethoscope (1819)



Vernier's caliper (mid-1600s)

Salter's spring scale (1770s)

Atkins' use of Talbot's photogram/ cyanotype process (1843)

Figure 2. Examples of tools, techniques, technologies, and machines of the scientific revolution that aided in the observation and measurement of people. Image credits: public domain.

Connected to these practices of observation and measurement of people, which generate what we might recognise as "data" for the first time - sets of similarly identified information - we see the invention of practices, structures, and techniques for dealing with this information

5 A more recent example that is relevant to mention is the use of isovists and trajectories in architectural analysis, developed from the 1960s and still in use today (see Bafna, S. (2003). We can see these techniques as precursors to machine aided eye tracking technology, relevant for work in player trajectory mapping in games, VR, and other interactive systems today (see Nilsson, Niels Christian, et. al. (2018). Even today some of the embedded values of ableism can persist in these technologies, in terms of notions of "average" height, visual acuity, mobility, reflex time, and more.

overload, like the table, the matrix, and the birth of statistics.[6] Keep in mind, all of this is made possible by the invention of textile-based rag paper (as opposed to animal skin parchment) and the printing press, which together make printed paper forms possible.[7] The proliferation of data and printed forms also contributed to the development of precursors to modern information systems such as the card catalogue and database, which are modes of categorisation and organisation that also have had reflexive effects on the perception of information and the world. [8] Precision measurement, and the data produced from such measurement had not only effects on the development of information systems but also had effects on perception and the conception of the self.

In her discussion of Ernst Jünger's writings on technology and destruction in the wake of World War 1, theorist Susan Buck-Morss describes early twentieth century technology as a "great mirror" in which "one sees oneself as a physical body divorced from sensory vulnerability—a statistical body, the behavior of which can be calculated; a performing body, the actions of which can be measured up against the norm; a virtual body, one that can endure the shocks of modernity without pain" (Buck-Morss, 1992; 20). Technologies of precision measurement also reconfigured notions of virtue, dating from the Early Modern period and extending to rhetorics surrounding contemporary digital wearable devices today, as discussed by Jacqueline Wernimont: "Beyond the purely physical, a fundamental claim of wearable devices is that data will bestow self-knowledge—the kind of self-knowledge that will create a fitter, happier, more productive person. This is a seductive promise, but not at all a new one" (Wernimont 2018, 91). To better understand

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6 See Jacquline Wernimont (2018) for an in-depth analysis of "the tables utilised to count human life and death across time and space in order to understand how tabular, quantum media are entangled with imperial, statist, and capitalist paradigms in ways that produce inequalities in the process of measuring as well as reporting human life and death" (6).

7 In Europe between 1400 and 1800, a massive flax linen industry recycled discarded fabric rags to create paper. Printers worked in teams to ink and press paper, generating up to around 3600 pages a day per two-person team. The entire paper production and printing process was intensely physical and materially entangled. For more on this history see Heidi Craig (2019).

8 For more on the development of the card catalogue see Bonnie Mak and Julia Pollack (2020). For research on the history of documents see Lisa Gitelman (2014)

this development, it is helpful to look to one of the points of origin in this larger history; to the development of precision timekeeping.

An important node in the history of precision timekeeping is the history of one particular timekeeping device, a specific clock, which is sometimes discussed as the clock that changed the world.[9] This clock was made by John Harrison in 1727, entirely of wood, and was important in solving the difficulty associated with calculating longitude, enabling precision navigation and the digital systems we have today for position calculation such as GPS. Harrison's clock enabled longitude calculation by comparing the time at current position (determined by celestial navigation in Harrison's era) with Greenwich mean time. The invention of the pendulum clock increased timekeeping precision prior to Harrison's work, but pendulum clocks were ill-suited to navigation at sea due to the rocking movement of the waves. Harrison substituted a balance wheel mechanism for the pendulum, and overcame metal workings' corrosion issues by instead using fully wood parts, and in particular the wood of the lignum vitae tree, which is self-oiling due to its natural composition. Harrison's clock or marine chronometer not only enabled location calculation with a newfound level of precision, but also contributed to colonisation due to increased abilities to navigate at sea. Technology that began as an aid for colonisers' navigation of the globe today contributes to the tracking of people, as with GPS trackers worn by people convicted of crimes serving time on house arrest or in the parole system.[10] And the lignum vitae tree, which produces the wood that made this all possible, is now endangered as it has been exploited for this property for hundreds of years, and was brought to the brink of extinction due to European harvesting of the tree during the colonial occupation of the countries where it grows in south and central America in the 1600s - 1800s. Due to the wood's natural properties, it was used not only for marine chronographs but also many other maritime components such as ship parts, also pressed into service in aid of European colonial expansion.

As colonial powers acquired new land, the need arose for more precise

9 To learn more about the Harrison Clock, see this brief BBC History of the World documentary: https://www.youtube.com/watch?v=T-g27KS0yiY&t=129s

10 See Richard Jones' research for a theorisation of the intersections of technologies of surveillance and punishment: Jones, Richard. (2000).

ways to measure land itself, demarcating ownership. The waywiser[11] was a device developed for this purpose. Envisioned by Leonardo Da-Vinci in a sketch from his notebooks in the late 1400s, the intended use of this wheelbarrow-like device was land measurement, an improvement over the older method of laying out and then measuring lengths of metal chain. Later waywiser designs from the late 1500s were designed to be worn, and were ornate, expensive devices of conspicuous consumption. They were large, heavy, and attached to the waist with a chain to the hip, knee, and ankle of the wearer. The waywiser technology was made possible due to the progression in precision watchmaking expertise and practice. The late 1500s and 1600s, the Early Modern period, is the period of enclosure, in which we see the enclosure of private land in many countries so that others cannot hunt or live there. Instead of the old way of measuring land (laying chain by hand) the waywiser lets the user more efficiently and more precisely measure, demarcate, and claim ownership of land. This capability was enthusiastically leveraged by colonialists to more efficiently lay claim to colonised land.

The waywiser eventually leads to the development in the late 1700s of the pedometer, with an early notable example in Napoleon's watch.[12] The story is that Napoleon's doctor wanted his patient to get in more steps to improve his health, but he knew that Napoleon would not agree to being monitored, and would also not agree to keep a written diary of steps taken. So, the doctor had a miniature waywiser secretly built into a watch for Napoleon, and unbeknownst to his patient, he was able to surveil his level of movement. By the late 1800s pocket watch pedometers were sold as common luxury goods, at outfitters such as Tiffany and Co. These devices were mostly marketed to men, but were sometimes used to surveil or track the movement of women, as recounted by Wernimont in her discussion of the "Slap at the Dancing Girl" news story, in which an exasperated father discovers the source of his lazy daughter's fatigue by secretly planting a pedometer on her, to discern that instead of sleeping at night, she sneaks out to go

11 To learn more about the invention of the waywiser, and connections with contemporary digital personal tracking technologies, see Jacqueline Wernimont's 2018 book.

12 See Wernimont (2018) pp. 124 - 126 for a discussion in more depth of the history and significance of Napoleon's pedometer watch.

dancing.[13] It is interesting to note that even in these early incarnations of the pedometer, the device is used both for gaining self-knowledge but also in the surveillance and tracking of others, and sometimes for punitive aims.

Today, the shadow device of the Fitbit or other luxury fitness trackers such as the Apple Watch is the carceral ankle monitor. The smart watch and the ankle monitor are the mirror image of each other, bringing together both technologies of the waywiser and the GPS into one single unit, in service of the state, on the one hand through participation in capitalism and the policies of consumption (the smart watch), and on the other hand (or rather, foot) in the prison industrial complex (the ankle monitor). We can see issues of racism surface here, with the disproportionate amount of wealth held by white people in the West who can afford luxury devices like the Apple Watch, and the disproportionate incarceration of people of colour in the U.S.[14] and the use of the ankle monitor in that context.[15]

2.1. Measuring People and Pseudoscience

The development of precision technologies for measuring people also coincided with the creation of a set of approaches that are grouped together under the classification of pseudoscience, as these approaches have been debunked as without scientific merit today. Even while these pseudosciences are no longer openly practiced, their unfortu-

13 See Wernimont (2018) p. 132 - 134 for an extended discussion of the dancing daughter example.

14 For a discussion of racial disparity in the American prison industrial system, see Glenn C. Loury (2008).

15 Interestingly, the inventors of the ankle monitor are not pleased with how their device has been utilised. Twin brothers Robert and Kirk Gable invented the device in the 1960s when they were students of renowned behavioural psychologist B. F. Skinner at Harvard. The Gable brothers wanted to create positive reinforcement for juvenile offenders to reduce recidivism. They made the first monitors from declassified military radio units, and implemented them to provide the monitored kids with rewards for good behavior, like movie tickets or pizza, when the kids showed up on time or were where they were supposed to be. Today, in the U. S. context, the monitors are used almost exclusively punitively, infringe on the wearer's civil rights, and cause problems with their inaccuracy and issues with false alerts. Bizarrely, the Gable brothers have not denounced their invention and remain "hopeful" in a recent article that it might be used for good in the future (Anderson 2014).

nate legacy continues to reverberate through culture, and contemporary threads can be found in some examples of current measurement practices as well. The three pseudosciences discussed here in brief are: phrenology, the Bertillon approach, and eugenics.

Phrenology is the practice of measuring the contours of the skull, in combination with the claim these contours can be meaningfully correlated with mental and personality traits. Phrenology is wrong in all of its conclusions, and was sometimes used as a tool to oppress people in terrible ways. It was developed by German physician Franz Joseph Gall in 1796, and was influential throughout the 19th century, particularly from 1810 to about 1840, but unfortunately has a legacy that persists. During its heyday, phrenology was attractive to some Europeans who sought a scientific justification for colonialism, and was used as a basis for claiming white European superiority over peoples of other races. By comparing skulls of different ethnic groups, phrenology supposedly allowed for a ranking of races from least to most evolved. Naturally, few phrenologists were abolitionists, since their argument was that the so-called 'natural' inequality of people, determined by skull shape, could be used to situate them in the most 'appropriate' place in society. Gender stereotyping was also common in phrenology, as was the stereotyping of children, who were variously categorised based on skull shape as slow learners, spoiled, neglected or harshly treated, wilful, disorderly, or at high risk of inheriting mental disorders. One of the most well-known applications of phrenology is the infamous stereotyping of criminal and psychological types, in which phrenologists sought to predictively identify people likely of committing crimes or inheriting or passing on mental illness.

Similar in some ways to phrenology, the practice of physiognomy also arose during this same time period. Physiognomy assesses a person's outer appearance, and in particular the face and even facial expressions, to draw conclusions about a person's character, personality, or emotional state. In the U.S., physician James. W. Redfield published *Comparative Physiognomy* in 1852, which was illustrated with 330 engravings depicting his ideas on the 'Resemblances between Men and Animals.' Redfield used these comparisons to stereotype people of different races with moral values commonly associated with different animals, with all the highly racist value judgements we might expect from

a project of this nature, with white German men associated favourably with lions, characterised as noble creatures, and people of other races associated with animals carrying negative connotations.

During the late 19th century, Englishman Sir Francis Galton carried forward Redfield's work in physiognomy by applying the latest technology to the effort, which was photography. Galton attempted to define physiognomic characteristics of health, disease, beauty, and criminality via a method of composite photography. Galton's process involved the photographic superimposition of two or more faces by multiple exposures. For example, Galton averaged together photographs of people convicted of violent crimes to develop a kind of 'facial key' for figuring out who is a criminal just by looking at them. (Galton is best known, however, as the originator of the concept of Eugenics, which is discussed later in the chapter). With the advent of computer technology during the 1990s, Galton's composite image technique has been adopted and accelerated using computer graphics software to make claims of facial identification of gender as opposed to sex (Yamaguchi, Hirukama & Kanazawa, 1995), personality traits such as trustworthiness (Safra, Chevallier, Grèzes & Baumard, 2020), emotional state (Murray, Robinson, Mateaus & Wardrip-Fruin, 2018), and social identities such as sexuality (Yilun & Kosinski, 2018).

Also developed via the then-new technology of photography, the Bertillon System was a technique for describing individuals based on a catalogue of physical measurements. Created by French criminologist Alphonse Bertillon in 1879, this practice led to the contemporary use of 'mug shots' or specialised photography for cataloguing and tracking those accused of crimes (see Figure 3 for an example). The Bertillon measurements were extremely detailed and included: standing height, sitting height (length of trunk and head), distance between fingertips with arms outstretched, size of head, right ear, left foot, digits, and forearm. In addition, distinctive personal features were noted, such as eye colour, scars, and other differences categorised as as so-called deformities.[16] This photographic and measurement system was used

16 For more on disability studies, see: Dan Goodley (2020) . Goodly shares reflections on decades of critical disability research on how cultural contexts and socio-political structures actually produce disability, that disability is not 'natural' or 'neutral' as a concept, and makes connections to the similar to the ways in which race has been culturally constructed with little scientific basis.

to identified criminals in the later years of the nineteenth century, but was soon displaced by more reliable and more easily-recorded fingerprinting techniques.

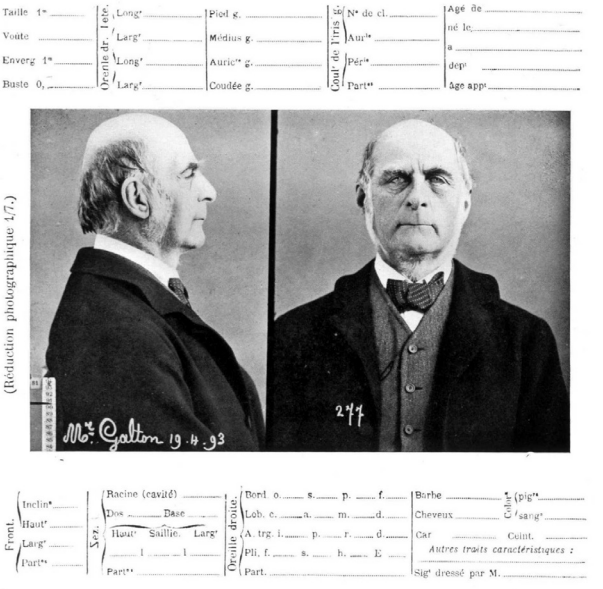

Figure 3. Photograph and unfilled Bertillon record of Francis Galton, age 73, created upon Galton's visit to Bertillon's laboratory in 1893. Image Credit: public domain.

Fingerprinting first developed in the late 1870s, both in colonial India and Japan, under the auspices of Sir William James Herschel, who was a British colonial official in India, and Henry Faulds, an archaeologist working in Japan.[17] Herschel was in charge of a road construction project, and asked Raivadhar Konai, a local contractor hired to the project to sign the road project contract with an inked imprint of his hand, even though Konai had already signed the contract with his signature (Waits, 2016). Herschel became fascinated with fingerprinting after this, and experimented with the process for nearly twenty years, with the aim of creating more efficient bureaucratic systems of colonial administration. Herschel's work might have had a negligible impact, had he not shared a selection of his ink imprints with Francis Galton in the late 1800s. Faulds' work with fingerprinting, which originated with his observation

17 Both Faulds and Herschel published letters in the journal Nature in 1880, and there has been some disagreement over the years about which should be considered the 'first' to conceptualise fingerprinting as an identification technique. See: Henry Faulds (1880)

of fingerprint marks on shards of pottery at a Japanese archeological site, also made its way to Galton via Faulds' colleague, Charles Darwin. Galton is well known as the originator of eugenics, and was thrilled by fingerprinting techniques, seeing potential for powerful synergy with his own biologically deterministic view of race and criminality. Indeed, fingerprinting did become a core tool in the carceral system but on an even larger scale helped to prop up the notion of a scientific basis for race for many years.

With Galton, we turn our focus to eugenics. Eugenics refers to a set of beliefs and practices that aim to improve the genetic quality of a human population, historically attempted by excluding people and groups judged to be inferior, and/or by promoting those judged to be superior. The contemporary history of eugenics began in the early 20th century, when a popular eugenics movement first emerged in the United Kingdom and then spread to many countries, including the U.S., Canada, and most of Europe. In this period, people from across the political spectrum espoused eugenic ideas, and as a result, many countries developed eugenic policies and laws, including measures like encouraging individuals deemed "fit" to reproduce, while prohibiting marriages or enforcing sterilisation onto people deemed "unfit" for reproduction. Those deemed unfit often included people with mental or physical disabilities, people who scored in low ranges on different IQ tests,[18] people accused of crimes or categorised as so-called 'deviants,' and members of disfavoured minority groups, such as queer people.

The eugenics movement became associated with Nazi Germany and the Holocaust when the defence of many of those on trial at Nuremberg in 1945-46 attempted to justify their human-rights abuses by claiming there was little difference between the Nazi eugenics programs and the U.S. eugenics programs. In the decades following World War II, with more emphasis on human rights, many countries began to abandon eugenics policies, although some Western countries (the U.S. and Canada among them) continued to carry out forced sterilisation on native peoples, incarcerated people, and disabled people. Traces remain today in powerful technologies like facial and image recognition, the return of 'race science'[19] and the rise of white supremacy, as well as the cultural

18 For a critical history of the IQ test, see Leon J. Kamin (2009)

19 For more on the contemporary resurgence of race science see Angela Saini (2019)

obsession with DNA ancestry tracing.

2.2. Data, Statistics, and Normates

Once people had generated all of this information (or data) enabled by precision measurement technologies and techniques and gathered by measuring themselves and others, they needed to create ways to classify and systematise this information, to render it legible and useful for various purposes. Carl Linnaeus is a major figure in the development of classification. Linnaeus was a Swedish botanist, zoologist, and physician who formalised binomial nomenclature, or the modern system of naming organisms, and he is also known as the creator of the modern concept of taxonomy. The first edition of Linnaeus' book on classification, *Systema Naturae*, was printed in 1735, and was just twelve pages long. Roughly two decades later, in the book's 10th edition, the work had ballooned to include over 4,000 species of animals and nearly twice that amount of plants.[20] People from all over the world sent their specimens to Linnaeus to be included in the taxonomy. By the time Linnaeus began to work on the 12th edition of his book, he needed a new invention to enable its scope — the index card.

The index card, along with the matrix or table, became powerful ways to organise, store, display, and interpret these new quantities of information. Tables were a bit older than Linneaus, and had been used with great effectiveness to count people about 100 years earlier during the mid 1600s in London. Tables were an important technology at that time, to enable keeping track of plague mortality counts, which are known as the first robust data set. The deadly plague provided for the birth of the disciplines of demography and statistics, and also led to the development of actuary tables (predictive statistics) and the insurance industry.

Englishman John Graunt published a book of plague mortality tables in 1662, making available one of the first large public data sets. A specialized form of death record was developed during the plague in 1603. These records, known as 'Bills of Mortality,' were a weekly tally of deaths in each neighborhood or parish in London during that time. Af-

20 Two recent papers that discuss the erasure of indigenous botanical knowledge that resulted from the colonial enforcement of Linneaus' botanical taxonomies around the globe include: Kendig, Catherine. (2020). and Toledano, Anna. (2021).

ter 1625, these were printed and distributed via subscription. Valuable as these tables were to their contemporaries and to historians today, they were notably inaccurate and we have no way (still today) to determine exactly how inaccurate they were. The form of the matrix itself helps to conceal inaccuracies and missing data. Looking at the matrix, it appears complete; it appears as a filled-in form of rows and boxes. There is no notation or graphic used to denote information not collected, not considered important, or to indicate levels of uncertainty about data collected.[21] The form of the matrix is seductive in the way it presents itself as complete, scientific, and objectively truthful, belying the lack of methods for representing inaccuracy or ambivalence. This legacy persists today, in the cultural perception around authority of statistics, versus the actual accuracy and meaningful of numbers presented as statistics.

It is relevant to discuss race here, since the concept of race is created around this same time period in which we see the birth of classification and taxonomy. A German doctor, Johan Friedrich Blumebach (1752 - 1840) is the person who invented the category of Caucasian, thus inventing whiteness in the modern sense. Just as plants and animals were being classified with new zeal during the Early Modern period, this classification was also applied to people with the invention of the concept of race. Blumenbach created a taxonomy of five races, identified by color, which he designated as follows:

- The Caucasian or white race, which according to Blumenbach included all Europeans.
- The Mongolian or yellow race, which according to Blumenbach included all East Asians and some Central Asians.
- The Malayan or brown race, which according to Blumenbach included Southeast Asian and Pacific Islanders.
- The Ethiopian or black race, which according to Blumenbach included all sub-Saharan Africans.

21 There is some knowledge about what kinds of information are missing from the tables. For example, Graunt's tables only recorded deaths of free men over the age of 21 who were members of the Anglican Church. Sometimes women's and children's deaths were included, only according to Graunt's own personal interest or whim, such as stillborn children, women who died in childbirth, or those who died by suicide. The tables also leave out some years entirely which were plague years, without giving any reason for these omissions (Wernimont 2018, 81).

- The American or red race, which according to Blumenbach included all North and South American Indians (Blumenbach, 1779).

It is striking to see how anti-scientific this classification is, also when one considers his method (he examined only sixty human skulls to arrive at his conclusions) and yet, what incredible cultural and political ramifications it has had, and continues to exert. The non-scientific origins of the concept of race lend it a flexibility those in power find useful to wield in oppressive ways. For example, during the 2020 election result reporting, CNN showed the following grid in the discussion of votes cast along racial lines (See fig. 4).

Figure 4. CNN television graphic reporting on voter turnout categorized by race, November 4, 2020. Image Credit: author.

In the discussion by the news reporter, the focus was on the Native American vote, which in the graphic was labeled as "something else." This erasure of Native Americans[22] is a classic colonialist strategy for justifying the seizure of their land, particularly pertinent during a presidential election, with even more relevance than ever in this particular election with Donald Trump's many policies that have targeted and negatively impacted native peoples, from the seizure of land for pipeline projects to the mishandling of the pandemic and defunding of native health systems. On Twitter, CNN viewers commented that the

22 For more on the lack of scientific basis for race, see the historical and ongoing differences in how U.S. government policy has defined Native American identity and Black identity: Yaba Blay. (2021); Ryan W. Schmidt. (2011)

network's table has also left out or conflated Pacific Islander, Indian, Middle Eastern, and multiracial people.[23] Perhaps this technique of race classification is not so useful in the discussion of election results, after all. But of course, race has deep cultural implications and consequences that are material and meaningful, despite it having no scientific, genetic basis.

The twentieth century brought a new perspective on the uses of measurement and statistics as it relates to understanding people and bodies, in particular via the development of what critical disability scholar Aimi Hamraie has theorised as the "normative template" (Hamraie, 2017; 19). As opposed to formalist or Platonic notions of ideal bodies from antiquity, twentieth-century normate bodies were derived from the data obtained via nineteenth-century measurement and statistical analysis techniques, thus rendering these normates scientifically 'proved' in a way that lends these templates a different kind of power in contemporary secularised, science-oriented society. By basing normates in statistical averages, a claim is made that the normate is 'natural,' and not created by the researcher (who of course designs the sampling, measurement, and analysis techniques). As Hamraie points out, the scientific rhetoric of these contemporary normates renders them not only powerfully descriptive but also prescriptive, as templates *for* normalcy. In this capacity, normative templates are powerful instructors of design.

Hamraie goes on to discuss the legacy of mid- and late- twentieth-century industrial designers and key figures in the then-emergent field of human factors, Alvin Tilley and Henry Dreyfuss. Based on decades of measurement, data, and statistics gathered via the U.S. military and industries of mass production,[24] Dreyfuss and Tilley published an industrial design handbook in the early 1960s, *The Measure of Man: Human Factors in Design* , that included Alvin Tilley's representations

23 The controversy around the CNN graphic was reported on: Laura Zornosa. (2020). "It appears CNN deemed Native Americans 'something else,' sparking a backlash."

24 The normative body can be traced back even further of course, to Leonardo DaVinci's Vitruvian Man and 19th century research such as Eadwaeard Muybridge's stop-motion photographic studies of humans and animals in motion. A difference in the 20th century is the way in which the non-normative human body came to be seen as an undesirably unpredictable element in the factory setting, for example, as a threat to productivity and profit.

of normative bodies of a man and woman known as Joe and Josephine, whose dimensions were derived from averages of these statistics. Later the normative body group came to include a man in a wheelchair and a man using crutches, in a 1980s edition of the handbook.[25]

In conclusion, the long history of measuring other people and ourselves is complex, and deeply entangled with colonialism and racist pseudoscience as a justification for the colonial project. Many outcomes of measuring people are good (for example, I am glad oncologists and radiologists can precisely measure and assess differences to identify cancer risks) but many are discriminatory and facilitate erasure or other oppression. This *duality* is something to be very aware of as researchers designing or selecting tools for measuring people, and to keep in mind when analysing and discussing the information obtained from measurement tools.

Here are some discussion questions to consider, reflecting on this section of the chapter focused on measurement:

- What traces of the historical technologies mentioned above can you find in game technologies today?
- What paradigms, methods, and approaches for measuring people can you trace back to some of the historical examples shared here?
- What are some key things to take away from the pseudoscience history of measuring people?
- Why is there such a pervasive, persistent connection between pseudoscience and measuring people?
- What can be done to dismantle impacts of these pseudoscience approaches to measuring people today?

The next section of the chapter will shift to focus on threads of game history that are not commonly highlighted, including the legacies of game culture (hunting for sport), military technology development, and the creation of the Computer Science discipline. While these three threads run in parallel with the history of measuring people discussed

25 For a more detailed examination of the 20th century history of the development of the human computer interaction field from the perspective of an industry insider, see Jonathan Grudin. (2012).

above, they all share a common impulse, and that is the frame of positivism.

3. Game Culture, Military Technology, and Computer Science

Game culture, or sport hunting, emerges in Europe during the same Early Modern time period discussed above, with the invention of the waywiser, and the enclosure of private land. While today game culture, or more specifically 'gamer culture' refers to particular sub-set of players of videogames, during the early 1800s game culture referred to people involved in the hobby of hunting for sport (Reynolds, McAllister & Ruggill, 2016). Part of what supported the rise of sport hunting as a popular pastime was the development of gun technology, which makes hunting much easier (as opposed to older methods such as bow and arrow, or hunting with a knife or spear). This gun technology was of course initially developed for military application.

With the expansion of nineteenth-century game culture we see hunting conceptualised quite explicitly as a game; there are rules, winners, losers, bad sports, all-stars, etc. Lord Ripon was one of these early celebrity hunters, known as the Best Game Shot in England. Over the course of his hunting career from 1867 to 1913, he shot well over 200,000 pheasants, averaging roughly 4700 pheasants per season. In this context, increasingly complex rules or codes of behavior were developed for sport hunting, including rules based in normative ethics such as, a hunter who wounds an animal must kill it as an act of mercy; killing a sitting duck is unfair; or hiding out to ambush a creature at a salt lick or watering hole is considered unsportsmanlike. The popularity of the sport hunting movement and commercial hunting led to terrible over-hunting, which eventually sparked the conservation movement, with some sport hunters shifting into advocacy roles within this community.

By the Edwardian period in the late 1890s and early 1900s, game culture leads to the development of target shooting, in part due to the technological development of the air gun. The sport became so popular that over time some 4,000 air rifle clubs and associations were created in England, with more throughout Europe and North America.

Also at the turn of the century, we see the emergence of carnival shooting galleries, which were sometimes elaborately themed as immersive interactive attractions such as the "Hunting in the Ozarks" amusement at the 1904 St. Louis Exposition, which simulated a wilderness hunting experience for visitors (World's Fair at St. Louis, 1904; 36). There is a clear lineage here between turn-of-the-century shooting galleries and the development of computerised arcade shooters in the 1980s., such as Nintendo's *Duck Hunt* from 1984, and immersive VR (Virtual Reality) first-person shooters today (Huhtamo, 2005; Voorhees, Call & Whitlock, 2012).

To trace the history of VR it is also necessary to shift our gaze back to to the Early Modern period, to the late 1700s. In 1787, an Irishman, Robert Barker, inspired by his military experience in Edinburgh with landscape painting,[26] created the Edinburgh panorama and applied for the first panorama patent. Barker is known as the inventor of the panorama (defined as a 360-degree painted experience), and his invention has been discussed as pre-cinematic and pre-VR by many theorists (Oettermann & Schneider, 1997; Grau, 2003; Griffiths, 2008; Rouse, 2019). Six years after Barker filed his panorama patent, the first purpose-built panorama rotunda was erected in Leister Square to house the Panorama of London painting. The building's architecture was carefully designed to shut out all interference from the outside world, and maximise subtleties that could add to creating the immersive illusion, such as a vellum covering on an overhead skylight, to allow for variations in light from weather changes to give the most realistic impression as possible. By the early 1800s Europe and North American were in the throes of a 'Pano-mania' in response to the mass popularity of the form. Purpose-built rotundas proliferated and painted panoramas toured multiple locations to accommodate millions of visitors.

At the cutting edge of panorama innovation, immersive panorama rides were created for the 1900 Paris Exposition, such as the *Mareorama*, which simulated a sea voyage. Visitors climbed aboard a real steamship platform that pitched and rolled, with side-scrolling panoramic paintings to provide the illusion of forward movement. Fans produced

26 Landscape painting and precision perspectival sketching was initially a military technology, used to document battles, used to document terrain, share reconnaissance information about the lay of the land, etc., along with cartography, before the invention of photography.

ocean breezes, there were lighting effects to simulate day, night, and a lightning storm, as well as actual seaweed and tar to provide olfactory elements for the experience, and actors playing the part of deckhands. However, these moving panorama spectacles were rare (and rarely operational; according to some reports they often broke down).[27] If you were to have attended a panorama experience during the early 19th century it is far more likely to have been a static, painted panorama, and most likely about a military battle, or on the topic of virtual travel, often the result of colonial expansion. The panorama of the Battle of Trafalgar, for example, was displayed for over a year from about May 14, 1806 through May 25, 1807. This was right after the actual battle, which took place in 1805, and the panorama was not presented as fictionalisation but rather as documentary. Military leadership greatly appreciated the use of panoramas to help tell the story of their victories in a compelling fashion, with Admiral Nelson personally thanking Robert Barker for helping to prolong public admiration for the battle due to the panorama.

It is in the same time period that Robert Barker (and later his son, George) presided over the rotunda in Leicester Square, that we find the development of the *kriegsspiel* or war game. This was created in Prussia first in 1811 by Georg Leopold von Reisswitz (military advisor to King Friedrich Wilhelm the 3rd in Prussia) and then improved to the version many are more familiar with today, by his son Georg Heinrich in 1824. This game or simulation brings together advances in mathematics and the science of cartography, plus concepts such as representational terrain, time-based turns, asymmetrical opposing sides, hidden information, umpiring or game-mastering, scenario design, and the use of dice-driven probability tables. Reisswitz did not come up with all of these innovations, but he did synthesise them in a particularly effective fashion.

Chess, too, is of course an important precursor as well as other earlier war game versions. In addition to the other differences enumerated above, the *kriegsspiel* made use of unadorned pieces representing people in an abstracted manner, as multiple 'units;' this depersonalisation stands in contrast with the highly elaborate design of some chess

27 For a more in depth discussion of Mareorama and related moving panorama rides see Huhtamo, Erkki. (2013)

pieces. The 1824 version of the kriegsspiel was an important advance in the development of the game, moving away from an oder tile-based board to play on an actual 1:8000 military topographic map — meaning that if a terrain had been mapped, you could effectively simulate war on it. The transition away from plaster tiles representing terrain to paper maps also helped to mass-produce the game more easily and cheaply, and it was distributed throughout the Prussian military in the 1820s.[28]

Just as the kriegsspiel brought together many distinct elements into an innovative synthesis, another example did so again in service of military simulation over a hundred years later. *Vitarama* , later commercialized as *Cinerama* (Reeves, 1999), was initially created by Fred Waller as an immersive interactive tank gunnery training simulation system for the U.S. army in World War Two (see Fig. 5). *Vitarama* brought together advances in motion picture technology, recorded sound, immersive techniques and sensor technologies. The gunnery trainer utilized a rear projector dome that blended footage of attacking airplanes from five cameras to create an immersive visual field. Actual tank gunnery equipment was mounted within the dome, for soldiers to train on. Multichannel sound augmented the experience, and an electronic gun fired a light beam onto a plate that could record the trainee's accuracy. The system was installed in multiple army training facilities in the U.S. and around the world, training thousands of U.S. and allied soldiers.

Following the war, after Waller's system was declassified, he reconfigured the gunnery trainer as a large-scale immersive film format known as Cinerama. Presented in specially built movie theaters, Cinerama used an extra-wide, curved screen to fill the viewers' field of view, presenting footage shot from a bank of three cameras. Spatialized sound was piped in through an array of speakers located in 360-degree arrangement around the audiences. The 1952 debut of Cinerama was a commercial and critical success, with the New York Times running a review on its from page that highlighted Cinerama as a new technological process, the first time a film reviewer had focused so fully on technical infrastructure (Crowther, 1952). Following Cinerama, we see the development of more wide screen cinema formats, and eventually

28 For more detailed discussions on the history of the kriegsspiel see Kirschenbaum, Matthew. (2016) ; Paxson, E. W. (1971)

IMAX in 1971. In the military technology sector, during this same period following Cinerama, we see the development of immersive image environments both with the CAVE approach and with the head-mounted display approach to create early VR and AR systems, which will both be discussed later in the chapter.

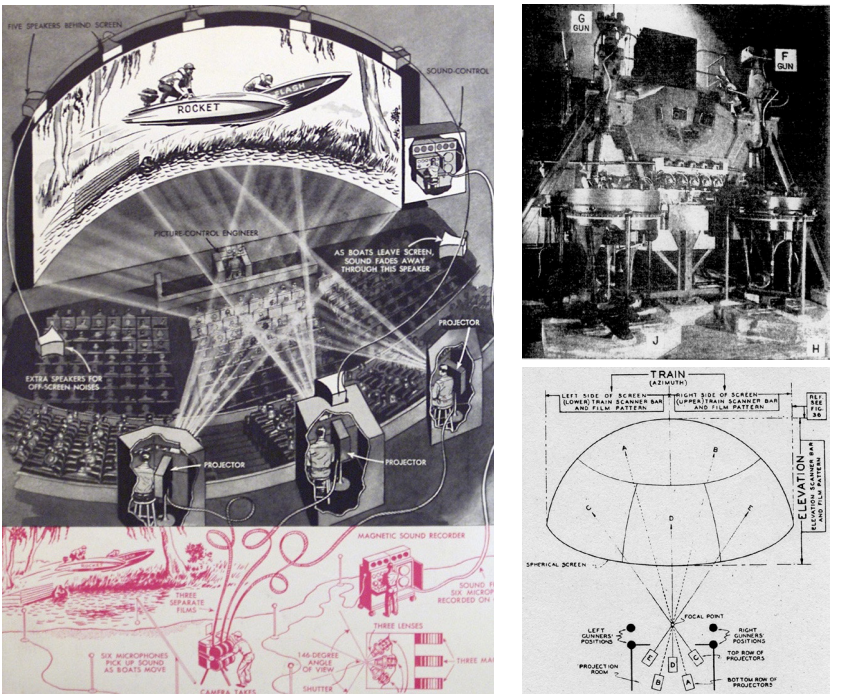

Figure 5. (Left) Photograph of commercialized Cinerama configuration diagram from Cinerama screening program. Image credit: author. (Right) Images of Fred Waller's Flexible Gunnery Trainer, showing birds eye view diagram on top and photograph of system below. Image credit: public domain.

Also during World War Two, computer technology development advanced rapidly, eventually leading to the development of the Computer Science discipline following the war. The early computers developed in the U.K.. U.S., and Germany during wartime were used both for simulation and calculation of ballistics trajectories, to aid in airplane stability control systems, as well as perhaps most famously in code-breaking activities. Following the war, these technologies were quickly commercialised. The professional association, ACM (Association for Computing Machinery) was founded shortly after the close of the war in the U. S. In 1946, and both industry and the U.S. government saw the potential in continued post-war usage of computers in service of

research. Along with the National Science Foundation, these groups worked to provide machines to all major universities in the country for this purpose. Early funding for this distribution project came from the Department of Defense, the Office of Naval Research, and the Atomic Energy Commission. Industry also contributed to spread the distribution of early computers to college campuses, with IBM providing deep discounts on purchases or rentals to universities.[29]

Once the computers were housed on campuses, the need to train staff to run the machines became evident. Early courses offered at the graduate level helped to create a pool of trained computer workers, and some of the first faculty involved in teaching these new courses were drawn from the mathematics and electrical engineering departments on these campuses. Over the next twenty years, from the 1940s to the 1960s, faculty debated the merits of considering Computer Science (CS) as a new discipline versus considering computation as a component of existing disciplines. By the early 1960s, U.S. academics had decided to create CS as its own discipline, with a stand-alone curriculum. The ACM's first curriculum committee was formed in 1962, and over the next three years this group worked to create an undergraduate CS curriculum. Part of the work of developing this curriculum took place at the IBM corporate campus in Poughkeepsie, New York. This illustrates the early and significant involvement of commercial industry in the formation of CS as an academic discipline.

The initial curriculum draft was published in 1965, and included a set of five required courses, with a further ten electives, but no evidence of any courses on ethics or the impacts and role of computers in culture or society (Atchison, 1985; 330). This was a bold move of erasure, given computers had been developed as military technologies. In the six decades since, faculty have struggled to remediate this erasure, with limited success.[30] The initial 1965 curriculum was further iterated by the ACM committee, resulting in the publication of the 1968 curriculum.

29 For a detailed account of the establishment of the Computer Science curriculum in the forty years following World War Two, see William Atchison (1985).

30 For examples of the ongoing work to develop a critical CS curriculum that meaningfully engages the ethical, social, and political entanglements of the discipline see: Vakli, Sepehr. (2018). Malazita, James W., and Korryn Restar. (2019). Ko, Amy J., and Alannah Oleson, Neil Ryan, Yim Register, Benjamin Xie, Mina Tari, Matthew Davidson, Stefania Druga, and Dastyni Loksa. (2020).

This version was more extensive, with 4 core courses, 9 intermediate courses, and 9 advanced courses, for a total of 22 courses in the curriculum overall. The 1968 curriculum was highly influential, and along with continued NSF funding providing computers to universities, the curriculum was used to develop CS departments across the country and even around the world (Atchison, 1985; 33).

The ACM curriculum committee, however, sought funding from the NSF again to further refine the curriculum, but were denied. They chose to work on the new version of the curriculum as an unfunded project, and so it was not three years in development but a further ten until the next iteration would be released. This 1978 curriculum included, for the first time, an elective course titled "Computers and Society." This new curriculum was criticized by many faculty for not continuing enough mathematics content. Around the same time that this third curriculum iteration was developed, the ACM also created a set of accreditation recommendations for evaluating CS programs in 1977. None of these accreditation recommendations make any mention of curricula that focus on ethics or the impact of computers in society and culture (Atchiston 1985, 334).

Also during this same time period in the late 1970s, computing conferences were host to increasing calls for the implementation of CS education in lower schools, but issues of ethical, social, and cultural impacts of the technology were still largely absent from this conversation. Nevertheless, in 1973, the push to bring CS to children's classrooms was supported by the creation of MECC (Minnesota Educational Computing Consortium), a new state agency tasked with the integration of computing in education at all levels, supported by local industry in Minneapolis, which was an early computer industry hub that included IBM, Honeywell, Control Data, and other companies with close ties to the defense sector. Well-known for the popular *Oregon Trail* (1979) as well as the more infamous and ill-fated *Freedom*! (1992), MECC was incredibly prolific in its development of educational software and succeeded in achieving a high level of integration of CS education at all levels. Following the loss of state funding in 1991, MECC was privatized, and then closed in 1999. However, the proselytizing mission had been a success, and CS, or at the very least computer aided instruction, is a part many peoples' education today, at every level around the world,

with EdTech as a significant industrial force in the education sector.

In addition to the establishment of the CS discipline, the 1960s and 1970s saw the growth and development of three key technologies that influence games today: artificial intelligence (AI), augmented reality (AR), and virtual reality (VR). In the history of AI development in the U.S., this thread comes out of the cold war arms race after World War Two between the U.S. and Soviet Russia.[31] Cold War game theory represented an innovation of the earlier kriegsspiel, and focused on predicting the actions of an opaque opponent. Today, AI is implemented in games in three key applications: autonomous agents (NPCs); drama/story engines (interactive storytelling); and procedural generation (responsive environments). Drawing on Alan Turing's research from the early 1950s, a group of researchers at Dartmouth carried forward his work and in 1956 coined the name Artificial Intelligence.[32] Games were (and still are) used by AI researchers as the petri dish in which to study intelligence by observing players making decisions, solving puzzles, and more. This research then fed back into game design. The connection was made by pioneering game designers like Carol Shaw, who created many games in the 1970s and 1980s for Atari and Activision, including VCS Checkers, Qubic, and River Raid (See Fig. 6). In the code for VCS Checkers, Shaw commented on an alpha-beta pruning algorithm she used, citing research papers on AI, machine learning, and computers and thought.[33]

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31 Note that the history of AI extends much farther back to antiquity and the history of mechanical automata, such as those created in the 1100's in Islamic society as discussed in: Hill, Donald. (1986).

32 Alan Turing, a brilliant mathematician and code breaker on the Enigma project at Bletchley Park in World War Two Britain, worked with some of the earliest mechanical computers, along with an army of women (much like the many women who worked to develop the ENIAC mainframe, and worked with NASA - see Light (1999) for more on the history of these women). Turing was gay, which was illegal a the time. He was convicted and subjected to chemical castration. He killed himself at the age of 41 in 1954, just four years after publishing his landmark paper "Computing Machinery and Intelligence" (Turing, 1950) in which he first proposed the Turing test concept, focused around the question of whether or not machines can think.

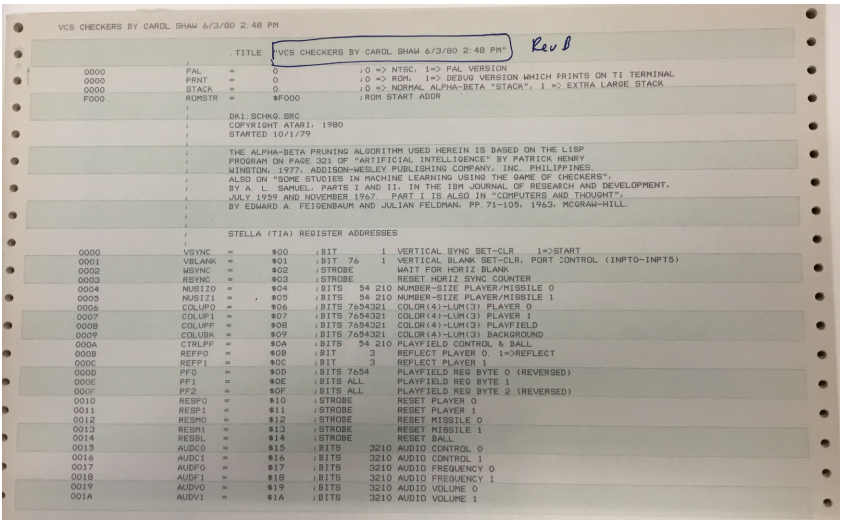
33 Carol Shaw papers, The Brian Sutton-Smith Library and Archives of Play at the Strong Museum of Play, Series 1: Atari, 1960-1980, Box 2, Folder 9, "VCS Checkers by Carol Shaw" source code listing for Atari 2600, 7.15.80, 1980. Accessed 2018 by author.

The intersections of games and AI continued, famously climaxing with IBM's 1996 Deep Blue computer's victory in chess over Gary Kasparov. From the 1990s to today, key focuses of research in AI include the development of neural nets, machine learning, machine perceptions, and intelligent agents. Neural networks are mathematical models that try to simulate the structure and function of biological neural networks, and learn complex functions by being fed examples. A probability and statistics approach dominates machine learning, and pattern recognition is key for applications in computer vision, speech recognition, robotics, and natural language processing.

Returning to the history of AR and VR, in addition to the Cinerama example discussed above, other important systems were developed following the Second World War. In 1966 Ivan Sutherland created his 'Sword of Damocles' head mounted display at MIT's Lincoln Labs, a military research contractor. Cave Automatic Virtual Environment (CAVE) systems, which are room-scale VR, were also in development during this time, at the University of Illinois, where the Electronic Visualization Laboratory (EVL) was established in 1973. In the late 70's the EVL developed an early dataglove for haptic interaction, a system for autostereoscopic 3D projection in the 1980s, and then in 1992 integrated many of their earlier innovations into the CAVE system. Also during the 1990s, on the West coast the University of Southern California also worked toward developing a research institute to act as a military contractor, drawing on the technical and storytelling expertise in the nearby Hollywood movie making community as well, in an echo of the interdisciplinary configuration that resulted in Cinerama. In 1999 the Institute for Creative Technologies (ICT) was established, with a focus on developing simulation games and training environments for the military, as well as innovating visual effects for cinema.

Key projects have included *America's Army* (Zyda, Mayberry, McCree & Davis, 2005) as well as *FlatWorld* (Pair, Neumann, Piepol & Swartout, 2003) from the early 2000s, which synthesized CAVE capabilities with an AR head mounted display, and traditional set design technologies, in immersive simulation training for Iraq War soldiers. The CEO of Oculus Rift, the contemporary VR company, was an intern at ICT working under VR designer Nonny de la Peña and veteran XR researchers Mark Bolas and David Krum, prior to leaving the lab to found the company

in 2012. The core technologies of Oculus were developed in the ICT research lab, building on their years of experience in the field.



```
VCS CHECKERS BY CAROL SHAW 6/3/80 2:48 PM

                .TITLE  "VCS CHECKERS BY CAROL SHAW 6/3/80 2:48 PM"   Rev B
                ;
0000            PAL     =       0               ;0 => NTSC; 1=> PAL VERSION
0000            PRNT    =       0               ;0 => ROM.  1=> DEBUG VERSION WHICH PRINTS ON TI TERMINAL
0000            STACK   =       0               ;0 => NORMAL ALPHA-BETA "STACK", 1 => EXTRA LARGE STACK
F000            ROMSTR  =       $F000           ;ROM START ADDR
                ;
                ;       DK1:SCHKG.SRC
                ;       COPYRIGHT ATARI, 1980
                ;       STARTED 10/1/79
                ;
                ;       THE ALPHA-BETA PRUNING ALGORITHM USED HEREIN IS BASED ON THE LISP
                ;       PROGRAM ON PAGE 321 OF "ARTIFICIAL INTELLIGENCE" BY PATRICK HENRY
                ;       WINSTON, 1977, ADDISON-WESLEY PUBLISHING COMPANY, INC. PHILIPPINES.
                ;       ALSO ON "SOME STUDIES IN MACHINE LEARNING USING THE GAME OF CHECKERS",
                ;       BY A. L. SAMUEL, PARTS I AND II, IN THE IBM JOURNAL OF RESEARCH AND DEVELOPMENT,
                ;       JULY 1959 AND NOVEMBER 1967.  PART I IS ALSO IN "COMPUTERS AND THOUGHT",
                ;       BY EDWARD A. FEIGENBAUM AND JULIAN FELDMAN, PP.71-105, 1963, MCGRAW-HILL.
                ;
                ;       STELLA (TIA) REGISTER ADDRESSES
                ;
0000            VSYNC   =       $00     ;BIT     1  VERTICAL SYNC SET-CLR    1=>START
0001            VBLANK  =       $01     ;BIT  76 1  VERTICAL BLANK SET-CLR, PORT CONTROL (INPT0-INPT5)
0002            WSYNC   =       $02     ;STROBE     WAIT FOR HORIZ BLANK
0003            RSYNC   =       $03     ;STROBE     RESET HORIZ SYNC COUNTER
0004            NUSIZ0  =       $04     ;BITS   54 210 NUMBER-SIZE PLAYER/MISSILE 0
0005            NUSIZ1  =       $05     ;BITS   54 210 NUMBER-SIZE PLAYER/MISSILE 1
0006            COLUP0  =       $06     ;BITS 7654321  COLOR(4)-LUM(3) PLAYER 0
0007            COLUP1  =       $07     ;BITS 7654321  COLOR(4)-LUM(3) PLAYER 1
0008            COLUPF  =       $08     ;BITS 7654321  COLOR(4)-LUM(3) PLAYFIELD
0009            COLUBK  =       $09     ;BITS 7654321  COLOR(4)-LUM(3) BACKGROUND
000A            CTRLPF  =       $0A     ;BITS   54 210 PLAYFIELD CONTROL & BALL
000B            REFP0   =       $0B     ;BIT     3     REFLECT PLAYER 0. 1=>REFLECT
000C            REFP1   =       $0C     ;BIT     3     REFLECT PLAYER 1
000D            PF0     =       $0D     ;BITS 7654     PLAYFIELD REG BYTE 0 (REVERSED)
000E            PF1     =       $0E     ;BITS ALL      PLAYFIELD REG BYTE 1
000F            PF2     =       $0F     ;BITS ALL      PLAYFIELD REG BYTE 2 (REVERSED)
0010            RESP0   =       $10     ;STROBE        RESET PLAYER 0
0011            RESP1   =       $11     ;STROBE        RESET PLAYER 1
0012            RESM0   =       $12     ;STROBE        RESET MISSILE 0
0013            RESM1   =       $13     ;STROBE        RESET MISSILE 1
0014            RESBL   =       $14     ;STROBE        RESET BALL
0015            AUDC0   =       $15     ;BITS    3210 AUDIO CONTROL 0
0016            AUDC1   =       $16     ;BITS    3210 AUDIO CONTROL 1
0017            AUDF0   =       $17     ;BITS    3210 AUDIO FREQUENCY 0
0018            AUDF1   =       $18     ;BITS    3210 AUDIO FREQUENCY 1
0019            AUDV0   =       $19     ;BITS    3210 AUDIO VOLUME 0
001A            AUDV1   =       $1A     ;BITS    3210 AUDIO VOLUME 1
```

Figure 6. Photograph of source code for Carol Shaw's VCS Checkers (1980), showing citations to contemporary AI research. Image credit: author.

Many other research labs in the U.S. and around the globe have contributed to the development of AI, AR, and VR over many, many decades. The current status of the technology is the result of an enormous number of researchers' work and cannot be credited to any single individual, while this chapter has highlighted only a few, and is not intended as a complete accounting but rather a broad overview.

4. Conclusion

Why do we have so many violent games? Why do game culture, games themselves, and the Games discipline all have such an inclusion problem? Surely the complex inheritances outlined in brief above help in understanding the embedded politics of why these struggles persist. Inheritances in games and GUX are complex and entangled with both invention and innovation, but also with violence and oppression. It is important to be mindful of this complex history as researchers and designers if we wish to develop games, tools and techniques with liberatory embedded values different from those that have been handed down to us from before. While systemic histories may make it seem

'easy' to (re)produce violent, dehumanising games or use research methods that abstract away agency and dignity from human beings via positivist framing, *play* is a much larger concept than games and infinitely more flexible. Bernard de Koven offers words of hope regarding the frame shift from game to play:

> "As a game community, we have abandoned any authority to determine whether or not the game we are playing is, in fact, the game we can play well together. That decision depends on who wins. The nature of a play community is such that it embraces the players more than it directs us toward any particular game. Thus, it matters less to us what game we are playing, and more to us that we are willing to play together." (De Koven, 2013; 12)

What parts of this complex history that informs the contemporary state of Games and GUX are you most curious about? Choose a topic and follow up with your own research on it, drawing on the references provided here or others that you find on your own. Choosing to be curious about our disciplinary origins is a key strategy for innovating our disciplinary futures together.

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Chapter 4

Players' Embodied Cognitive Interactions in VR Environments

Maurice Lamb

Virtual Reality (VR) has been a promise for many decades, one we are, in many ways, still waiting to see fulfilled. But as games change, screens become bigger, and players become more adaptable to modern computer interfaces, it is increasingly important to explore what makes VR different from more traditional screen and controller based digital presentation mediums. Understanding why VR has a distinctive feel is critical for understanding where and when VR can be better/neutral/worse when compared to other formats. A lot of discussion on this question focuses on the role of increased sensory information in creating an increased sense of immersion. While the increased sensory information is valuable, I find the connection between our bodies and the digital world presented in VR to be much more interesting. As a part of my own research into human behavior, exploring what this connection allows for creates opportunities to help us understand key features of human cognition and human experience. In thinking about how humans interact with digital realities through VR and similar technologies, it is important to start with understanding how our bodies are connected to perception and cognition (spoiler alert: they are super-duper connected). It may also be instructive to see how this connection can be leveraged to explore new questions regarding human cognition and behavior.

Cognition, behavior, and perception are so entwined with our bodies that it rarely makes sense to discuss one independently of the others, even if that is how they are commonly discussed. It follows from this,

possibly radical, position that what makes VR so compelling is not visual/sensory realism of the 3D scene (though that does not hurt), rather it is the ways that VR allows for a strong and bi-directional connection between our bodies and a digital reality. Understanding the connection between action and perception, body and reality, is central to theories of embodied cognition, VR allows us to play with that connection for the benefit of both entertainment and for science. In this essay, I will first discuss the connection between body and perception, then I will discuss how VR can help scientists explore human behavior, perception, and cognition.

1. Embodiment, Vision, and VR

There are uncountably many images of tourists "holding up" on the Leaning Tower of Pisa. This tourist trope works because a small object close to the camera can look bigger than a much larger object far from the camera when distance cues are obscured. While this fact allows for all kinds of interesting (and mundane) camera tricks, it is also the basis for what some have considered an incredible challenge for human visual systems. A challenge that our visual systems seem to have solved. When one stands on the lawn in front of the tower, it is easy to see many small humans having a fun time pretending to be mimes in front of a very large tower. In person, it is very hard to see anything else, even with very careful positioning. Yet in the still image, the joke works, the tourist becomes a giant holding up an old building. Early vision theorists and researchers puzzled this perceptual challenge and potentials solutions that might be implemented to solve them, and this remains an ongoing area of research (Descartes, 2001; Gibson, 1966; Marr, 1982). Notably, the human eye isn't all that different from a camera, light from the visual scene is projected onto a surface at the back of the eye such that what is "seen" is no different than a camera's still image. However, despite the similarity of what is seen and what is photographed, many people have little or no trouble estimating the size and distance of objects in ordinary settings. While many mechanisms in human visual systems (binocular disparity, accommodation, vergence) can help explain some of the human ability to distinguish size and distance, none of these systems can fully explain the experience of depth, and many are geometrically limited in usefulness to only a few meters in front of an individual. Further, the robustness of human depth experiences,

even when one or more of the standard mechanisms is inhibited, is quite impressive. In 1966, the psychologist James J. Gibson suggested that a critical insight required is that our visual systems are a part of our bodies and that our bodies move continuously (Gibson, 1966). The motion of our bodies introduces a number of depth cues that do not typically exist without motion and that are useful across a much wider range of distances and contexts. In particular, self-motion affects parallax and optic flow. The close connection between perception and motor systems means that many of our perceptual experiences depend on our motions and actions just as many of our actions depend on our perceptual experiences. Since this initial insight, experiments have expounded on this connection showing the ways that our own ability to move and act in the world (both intentionally and unintentionally) dramatically impact how we perceive and experience the world.

2. VR

Until recently, digital environments were almost exclusively experienced on 2D screens. No matter how big the screen is or how many are configured in an array, the screen(s) are a static and disembodied window into a digital reality. Even when that reality is 3D, there is something flat and compressed about it. Exploring a digital reality with keyboard/mouse/controller can help us understand the digital reality, in fact there is a marked difference in the experience of controlling an on-screen character and watching it be controlled. In any case, when the digital reality is only presented as compressed on a 2D screen we are left with a clear sense that the digital reality is there and not here. The tourist is holding up the Tower of Pisa no matter how big the picture is, once the image is captured, we are trapped in that lie. The static image simply cannot be the same experience as the field of mimes scattered in front of the tower. The image is a unique experience, but it is not the same as being there. Standard fixed screen setups only ever provide a window into a digital reality, often only providing a near approximation of a world with depth, a useful illusion. Adding 3D capabilities to a screen enhances the experience of depth, but doesn't really create a sense of "being in" the digital reality (Heater, 1992). Digital features jump out from the screen, but the reality never quite surrounds. The critical ability to step into a digital reality occurs when the body (including its ability to move) becomes connected to the screen.

When our movements affect what we see in the digital reality, our visual perspective shifts and there is a corresponding qualitative shift in experience. The digital reality becomes here or a least very near. In VR HMDs and CAVEs this shift occurs when our head movements drive what is presented to us in in the virtual scene. The ability to move one's head in VR allows for the perception of depth and scale as we perceive them ordinarily in our everyday realities. Self-motion generates optic flow and parallax, providing necessary information about scale, size, and distance in the digital environment. High latency, inaccurate/lost tracking, or low framerate are ways this connection is broken and common ways that VR experiences break or become uncomfortable. Anyone who has experienced a game freezing up in VR knows the disorientation that occurs from the visual scene suddenly becoming glued to one's face. You are no longer in the digital reality; some digital goblin has merely glued the digital scene to your forehead. Critically, image realism can affect the experience, but it isn't critical for the feeling of being there. Low-poly, cartoonish, and fantastical images don't break immersion, though they may have effect other experiences of the quality or believability related to the digital reality. Our ability to act and perceive in the digital reality is the difference maker in VR.

3. Bring Digital Realities into Science

Our understanding of what makes our experience of the world feel so immediate has guided us (explicitly and implicitly) in the development of technologies that allow us to begin to more immersively experience digital realities. In presenting digital realities and providing a means to access them, VR creates a new space to explore human perception, behavior, and cognition. While the focus of tech entrepreneurs, pundits, and consultants is on the growing role of VR in gaming and industry, science labs across the world are using VR to test novel hypotheses and interventions to further our understanding of what it means to be human. The scientific potential of VR is grounded in the fact that the same mechanisms that allow VR to feel so immersive are also the mechanisms that make our everyday experiences seem so present. While VR can be just another gimmick, used to add a veneer of modernity to a mundane project, it can also allow for novel paths of scientific inquiry. In this section, I'll discuss two scientific applications of VR in the context of cognitive science research in order to highlight VR use

in science. For both of these projects part of what makes them stand out from previous VR resaerch in cognitive science is that development was completed without dedicated technical assistants and with relatively minimal budgets.

In one study, we were interested in replicating the effects of delayed self-perception on the ability to predict a chaotic system (Washburn et al., 2019). For those unfamiliar, a chaotic system is one that is both deterministic and unpredictable. A deterministic system is one in which every state of the system follows directly from the previous state of the system. Chaotic systems are unpredictable in part because small differences in the previous state can result in very different current states. One particularly visceral chaotic system is the double pendulum system which involves replacing the bob of a standard pendulum with another pendulum, though on a larger scale many critical climate systems are also chaotic systems. In a double pendulum the interaction of forces of the linked pendulums affect one another in ways that result in deterministic but unpredictable behavior. No two swings of a double pendulum will ever be exactly the same. Because chaotic systems are so sensitive to changes in initial conditions, humans should be bad at predicting the motions of chaotic systems. However, in the right situations humans tend to be pretty good at predicting such systems. The right situation involves attempting to behaviorally mimic the chaotic system while receiving delayed information about one's own current state. In a non-VR study this was accomplished by using a digital pen input and showing the user's pen location on a screen with a small delay. When the user was instructed to follow a chaotically moving dot on the screen with their pen and there was no delay, they consistently followed the dot. But when their pen's location was delayed, they would get ahead of and lead the dot on occasions. In VR we could remove all visual perception of the user's body and show them the position of their hand in the virtual space. We could then delay the visual position of the virtual hand relative to their motion tracked hand's position. The result was the same, delays allowed for predictive motions. The outcome of this study was to develop an artificial agent that could perform comparably to a human using the same underlying dynamics. The insights from this research contribute to our understanding of the potential role of perceptual-motor delays in acting in the world. It might also be guiding in the design of VR interactions, as

certain kinds of visual delay might be beneficial as opposed to harmful. Delays are often seen as a problem to overcome. However, in this case, they may be what makes the system function successfully. While VR was not required for the initial insight, it made it possible to create a more robust experimental paradigm in which data could be collected and then the model could be directly tested with real humans as opposed to simulations.

In another study, we were interested in how pairs would work together to accomplish a relatively complicated cooperative movement task (Nalepka et al., 2017). The task involved "herding" a set of randomly moving balls on a table. Participants stood across from one another at a table wearing VR HMDs and holding a motion tracker in their hand. In the digital reality they could see their own digital body and that of their partner. On the table a set of balls would roll around randomly but would "run away" from the participants' motion tracked hands. Participants had to work together to keep all of the balls in the center. By running the experiment in VR, we were able to accomplish several novel results as well as shift the digital settings in interesting ways. Once we identified a dynamic model of participant behavior, we could introduce an artificial agent as the partner and run a pseudo-behavioral Turing test to see if participants could identify when their partner was the model instead of a human. An interesting feature of using a shared physical and virtual space for the study was that participants had to adjust their behavior in order to not collide with one-another in the physical space. We hypothesized if the table was not constraining their movements their solution would change so that instead of moving back and forth on their own side of the field, they would encircle the balls once they were grouped. In order to test this hypothesis, we rescaled the digital space such that participants could walk among the balls to herd them, effectively taking on the role of the hands in the previous version. They very quickly began to move around the balls in a circle once they were herded together as predicted. Notably, at this scale their behavior became qualitatively similar to that of trained sheepdogs herding sheep. Not only did VR allow us to quickly iterate versions of the herding task and test an artificial agent, we were also able to test multiple behavioral modalities (hand movements and walking) in 3D. This eliminated the need to make inferences from fixed 2D stimuli and severely constrained input modes to more robust and nat-

ural human motions in 3D.

4. Conclusion

Advances in games technologies often build on understandings gained in basic research into human perception, behavior, and cognition. Less often considered are the ways that games technologies have filtered back into these research domains. The recent development of consumer VR HMDs that quickly exceeded the quality of the previous research focused systems is one area of particular interest. While many computer technologies have been incorporated into cognitive science research, VR is one of the first technologies that leaves critical connections between perception and action intact. Understanding this connection can allow us to create better and more immersive technologies, it also allows us to use those technologies to explore the limits of human perception, behavior, and cognition.

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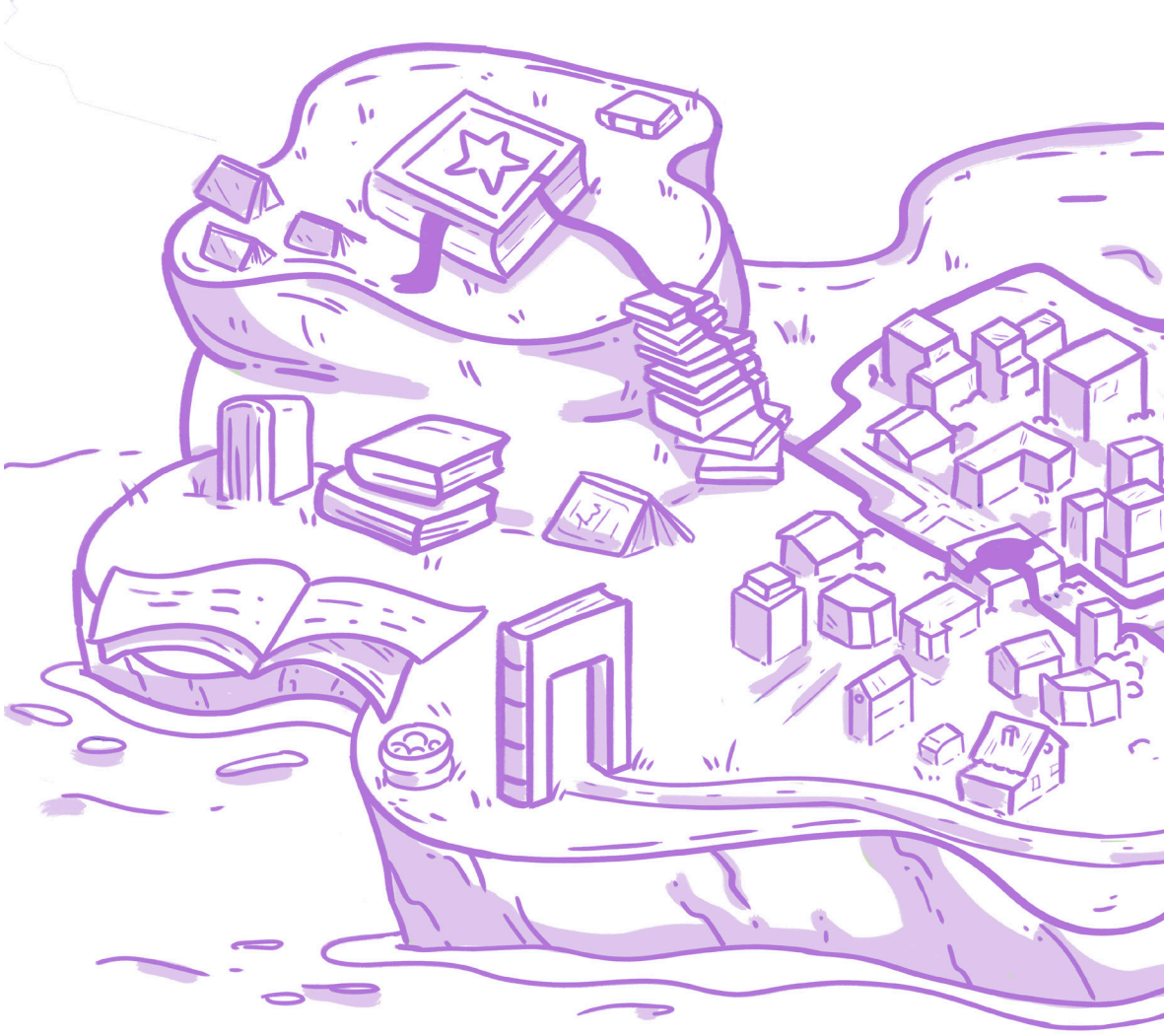
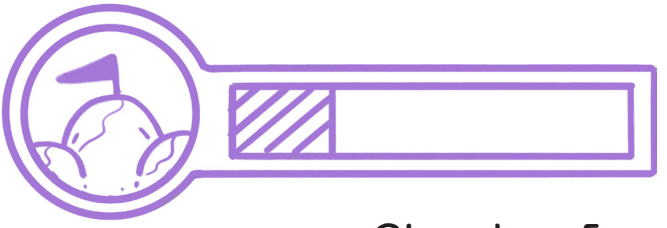
GUX, INDUSTRY, AND ACCESSIBILITY





Chapter 5

Game Analytics: An Indie Perspective

Amit Goyal &
Valgarður Ragnheiðar Ívarsson

Abstract

Game analytics as a research tool has been largely associated with AAA studios and the mobile Free-to-Play industry. We aim to provide insight into how independent game development studios view and apply game analytics in their processes. Through in-depth interviews, we attempt to uncover the indie perspective on analytics and how it has changed over time. We also delve deeper into the application and ethics of analytics, as well as the challenges faced by indie studios that affect their adoption of analytics. An analysis of the interviews yielded 3 primary types of game analytics: Behavioural, Business, Marketing and App Health analytics, with some of the most significant challenges being a lack of resources, poor fit with commercial tools and ethical/legal considerations. Our aim is to present these topics for new indie developers to learn from, using the experience of practising indie developers as they evaluate and implement analytics in their projects.

Keywords: Analytics, Indie, Free-to-Play, Premium Games, Game development, GRUX

1. Introduction

Analytics is a term that has become increasingly popular in many sectors of the tech industry. Analytics allows for companies to get an intimate glimpse into peoples' usage of a product, which can help guide

internal decision-making policies. Video game companies are no exception to this. In fact, the act of applying analytics to video games is so common that it has gained its own term, game analytics. Analytics refers to the systematic computational analysis of data or statistics, and by extension, game analytics means to use data to help guide game production or research.

As with most other forms of analytics, the history of game analytics is tightly interwoven with the rise of the internet. The ability to collect data near-instantaneously from anywhere in the world provided companies with unprecedented access to data. As a result, data collected for use with analytics most commonly comes in the form of telemetry. Telemetry refers to data collected over a distance, being a concatenation of two words: distance (tele-) and measurement (-metry). Finally, through game analytics, telemetry is turned into game metrics. Game metrics represent interpretable data related to games (Seif El-Nasr, Drachen & Canossa, 2013, pp. 5-6). For example, telemetry can be turned into metrics like 'deaths per-level' or 'playtime per-week'.

The first instances of game analytics can be traced back between the mid-to-early 1990s: to the origins of MMOs like *Neverwinter Nights*, *The Realm Online* and *Ultima Online*. These early MMOs required a wide array of behavioural metrics to function, so systems were created to automatically track in-game actions of each player. MMOs were ambitious endeavours, as they required significant resources to develop, host, and maintain. Because of this, the MMO genre became dominated by large and well-established AAA studios, with game analytics consequently falling into their domain. The AAA companies' reign over analytics was further solidified by the fact that any information about the practice of analytics, from tracking to analysing data, was considered a trade secret (Drachen & Connor, 2018, p. 339).

Eventually, game analytics would spread to other sectors of the game industry. Around the mid-2000s, website analytics had grown to become a common tool to use within web companies (Shu, 2015). Various analytics companies launched products offering affordable in-depth metrics tracking, including Google Analytics in 2005 (Google, 2014) which remains a juggernaut in the field of analytics to this day. This change eventually transferred over to video games in the early 2010s. Companies offering analytics specifically for games started entering

the market such as: DeltaDNA in 2010 ("About us", n.d.), GameAnalytics in 2011 ("Our mission", n.d.) and UnityAnalytics - previously Playnomics in 2009 (Ramachandran, 2014). Game analytics started becoming available to anyone, helped by the fact that game analytics started becoming an object of academic interest. This is exemplified by the 2013 book, *Game Analytics: Maximizing the Value of Player Data* (Seif El-Nasr et al. 2013), which uncovered various AAA-industry-standard practices related to implementing, tracking and analysing player data.

The first companies to take advantage of this development was the then-new mobile game market as they started applying the Free-to-Play (F2P) business model to their games. Both Google's Play Store and Apple's App Store exploded in popularity around this time, reaching over 1 million apps by the end of 2013 (Ingraham, 2013; Warren, 2013). At the same time, F2P games were steadily moving to the forefront of both marketplaces, with F2P games overtaking premium games in revenue in Apple's app store in 2011 (Valadares, 2011).

It quickly became apparent that game analytics and F2P games were a natural fit. Game analytics gained widespread adoption with F2P games, to the point of defining industry-standard performance metrics using analytics. This is usually attributed to the fact that the F2P monetization model allows users to start using a service for free with the expectation that a portion of the player base will eventually be converted into paying customers (Mäntymäki, Hyrynsalmi & Koskenvoima, 2020, p. 2). Game analytics offers the possibility of tracking various behaviours and using that information to optimise the game to increase the amount of paying customers.

The independent (indie) game market emerged at a similar time as F2P games, with all major game console manufacturers having created support programs for indie game development by 2013 (Rose, 2013). While the F2P industry's business model created the incentive for analytics, indie games primarily kept the AAA industry's premium business model. This led to slow adoption of analytics by the indie game market as the companies were both smaller and had fewer resources than their AAA counterparts, providing little space to explore analytics in their games.

Yet, indie companies have found ways to make use of analytics in their products. For example, in a 2019 Game Developers Conference panel, the developer of *Subnautica*, Unknown Worlds Entertainment discussed its use of analytics. There, they explain that the information gained was very important for evaluating the players' pace of progression, claiming that game analytics works "much better than sitting in meetings and trying to figure it out on a piece of paper". (Boetel, 2019). Through interviews with 7 indie developers, this chapter aims to provide insight into indie developers' perspective on analytics. We will explore how indie developers' views on analytics have evolved, how developers approach the ethics of analytics, the different approaches they take towards its implementation, from tools to workflows, and the limitations they face. We hope to provide indie developers with insight into the value of implementing analytics, the roadblocks they may face and practical advice on how they can work around challenges to leverage analytics to their benefit.

2. Research Method

Data was collected through in-depth interviews with seven professionals from indie game development studios which were conducted between February and March of 2021. The sample included a wide range of game development experience to capture how the use and understanding of analytics evolves over time. We had two studios with relatively little experience (0-1 released games) and five studios with more established portfolios (2 or more released games). Additionally, two of these studios have either released or are working on free-to-play (F2P) games, while the remaining studios have exclusively worked on premium games. A more detailed description of the studios can be found below in the participants' sections. All interviewees were key decision makers in their respective studios.

The interviews were conducted in English remotely over Zoom. The interviews lasted 45-60 minutes and followed a semi-structured pattern. To gain an understanding of how indie developers use analytics and the challenges associated with them, the interviews did not follow a strictly defined protocol. This was done in the hopes that perspectives on these subjects could emerge naturally and conversationally from the participants' interviews. All interviews were recorded with the per-

mission of the interviewees, and then later transcribed using an online transcription tool called otter.ai.

2.1 Participants

Flamebait is a Swedish 6-person studio founded in 2016 by a group of Bachelor students at the University of Skövde. So far, they have released 3 games: *Passpartout: The Starving Artist*, *Verlet Swing* and *Forge and Fight*. We spoke to Mattias Lindblad who will be referred to as Flamebait for the rest of the chapter. Figure 1 shows Flamebait's 2020 game, *Forge & Fight*.[1]

Figure 1. Gameplay from *Forge & Fight*. Image used with permission from Flamebait.

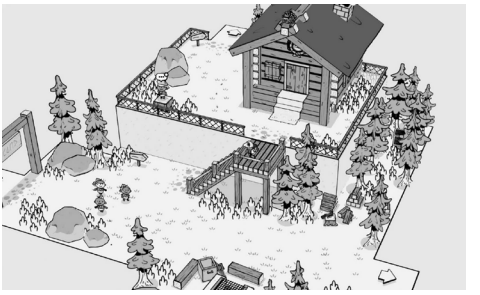


Figure 2. Gameplay from *TOEM*. Image used with permission from Something We Made.

Something We Made is a Swedish 2-person company that recently released their first game *TOEM,* as seen in Figure 2. While the core team is composed of two people, they have external contractors helping them with development. We spoke to Niklas Mikkelsen who will be referred to as Something We Made for the rest of the chapter.[2]

Other Tales Interactive is a 2-person Swedish/Danish team. In March 2019, they released *Tick Tock: A Tale for Two*, a two-player co-operative puzzle game played on two devices that focuses on communication. We spoke to Mira Dorthé who will be referred to as Other Tales for the rest of this chapter.[3]

Kitfox is a 9-person Canadian company based in Montreal and was

1 Flamebait's website: https://www.flamebaitgames.com/

2 Something We Made's website: https://www.somethingwemade.se/

3 Other Tales' website: https://www.othertalesinteractive.com/

founded in 2013. So far, they have developed 4 games: *Lucifer Within Us, Moon Hunters, Shattered Planet* and *Boyfriend Dungeon* and published 4. We spoke to Tanya Short who will be referred to as Kitfox for the rest of the chapter. Figure 3 shows their most recent game, *Boyfriend Dungeon*.[4]

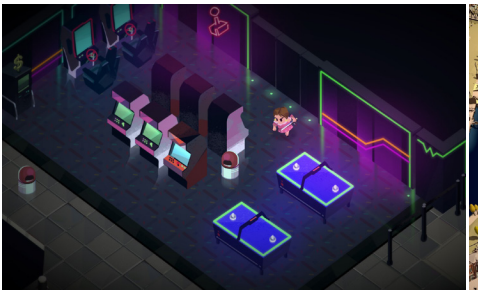


Figure 3. Gameplay from *Boyfriend Dungeon*. Image used with permission from Kitfox.

Figure 4. Image from *City of Gangsters*. Image used with permission from SomaSim.

SomaSim is a 2-person American company based in Chicago and was founded in 2013. They have released three games for PC, the most recent being *City of Gangsters* as seen in Figure 4. We spoke to Robert Zubek who will be referred to as SomaSim for the rest of the chapter. [5]

Blindflug Studios is a 15-person company with two studios in Zurich, Switzerland and Poznań, Poland respectively. They started in 2014 and have worked on games for both PC and mobile platforms. We spoke to Jeremy Spillmann who will be referred to as Blindflug for the rest of the chapter.[6]

Game Swing is a 13-person studio based out of Copenhagen, Denmark. They have one previous release and are currently working on two games - one for PC and consoles and the other for mobile. We spoke to Lars Bindslev, referred to as Game Swing for the rest of the chapter. Gameplay from their most recent game, *OddBallers*, can be seen in figure 5.[7]

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4 Kitfox's website: https://www.kitfoxgames.com/en

5 SomaSim's website: https://somasim.com/

6 Blindflug Studios' website: https://www.blindflugstudios.com/

7 Game Swing's website: https://www.game-swing.com/

2.2 Data analysis

The interview data was analysed using thematic analysis (Braun & Clarke, 2006). To start with, the transcripts of the first four interviews were read and codes were assigned to describe the contents, with each researcher given two interviews to assign codes. The codes were then consolidated through a discussion and the remaining three interviews were subsequently coded. The code assignment of the previous interviews was then revisited to see if any changes were necessary.

The finalised codes were collected into themes that served as an outline for the different topics covered in this chapter. "Analytics from an indie standpoint" covers the attitudes of indie developers towards analytics and how they have changed from a decade ago when analytics were new to games, as well as the ethical implications of data collection. "Types of Analytics" breaks down Analytics into different categories along with their use cases and the experiences of the interviewed indie developers with all of them. Finally, "The Indie Approach to Analytics" deals with various challenges that slow down the adoption of analytics by indies.

3. Analytics from an indie standpoint

In this section, we discuss the general attitude of indie developers towards analytics and how it has changed over the last decade. We also discuss the ever-increasingly important subject of ethics in analytics. However, before delving into the topic, we feel it is important to frame the context in which we use the term "indie developers". The term is subject to much discussion, and to date, the industry has not settled on a clear definition of the term. While it is outside the scope of this chapter to define the term, prior research on the subject associates certain characteristics that are shared amongst games termed as indie (Garda & Grabarczyk, 2016; Ruffino, 2012, p. 107). These include: digital distribution, experimental nature, small budget, low price, small team size, and the use of commercial ready-to-use game engines. Garda and Grabarczyk argue that the relation of the term "indie" to these characteristics is fluid and shifts over time due to unspecified external circumstances that affect the industry. Some important properties related to the discussion of game analytics are: small teams, experimental nature

and the use of ready-to-use game engines, all of which were properties the interviewed developers shared.

3.1 First impressions

The rise of the indie games industry was kicked off in 2008 by the critical and commercial success of indie titles such as *Braid* and *World of Goo* (Pérez Latorre, 2016, p. 2). This coincided with new trends in the gaming industry, some directly fuelling the growth of the indie market. Digital platforms for distribution of games gained prominence, as did mobile games with the explosive popularity of smartphones. This not only brought new opportunities for indie developers, but also introduced new trends to development in general. One of these was the increased prominence of data-centric approaches to software development which carried over to games, especially to mobile game development.

> "I think there was a bit of a culture shock with mobile games and web games, in the late 2000s, early 2010s, of having sort of web developers, sort of start spreading the A/B testing mantra and start spreading the entire culture of continuous optimization." - SomaSim

According to SomaSim, one of the reasons for this was the relative novelty of mobile games back in the early 2010s. A medium which was confined to PCs and consoles was suddenly accessible to a new audience and player expectations were much lower as a result. This created room for several web and app development processes to find their way into game development. Ideas like 'minimum viable product' and 'revenue optimization' gained a foothold and had become ingrained by the time F2P games became the dominant business model for mobile games. It was an altogether interesting phase for developers to try out new tools and workflows.

In the indie community, commercial interests are often perceived as a threat to the "gamer ideology", according to which the gamer experience is to be held in high esteem (Styhre & Remneland-Wikhamn, 2019, p. 231). As per SomaSim, the practice of launching a game and optimising it for revenue based on user feedback worked for F2P games, but

it also led to suspicion towards number-driven design amongst indies as it could be construed as greedy. For developers who approached games as a medium to communicate an experience to their players, the emphasis on things such as maximising average revenue per paying user was hard to digest. This sentiment was echoed by Kitfox, who said that it led to something of an us-versus-them mentality amongst indie developers in the early days of analytics and F2P mobile games.

> "the early web and mobile companies would come in and start showing how they do this quantitative stuff, kind of ignoring the fact that it doesn't work for most games. It only works for these kinds of web and mobile games because that platform was new." - SomaSim

Further, some indie developers consider analytics to be almost antithetical to the creative process of developing games. In their interview, Other Tales described analytics as less fun than other aspects of game development. All these factors could be considered a significant repellent to the full-fledged adoption of analytics by indie developers, but as our interviews revealed, these perspectives, much like the game development industry, are ever-changing.

3.2 Shifting perspectives

> "I think there was a time when telemetry was also new and exciting. And people were just sort of just trying to see what they could do with it. And now we've sort of as a development community, we've kind of figured it out, we kind of have a better idea of what to do with that" - SomaSim

In the past decade, analytics have been demystified to a large extent. They've settled into their usefulness for certain types of games and business models, and there is a fair amount of literature and dedicated services for developers who want to get started with analytics. The attitude towards analytics has also softened over time. As Kitfox pointed out, analytics themselves are not good or bad. Instead of approaching development with a design-by-numbers perspective, they treat analytics as another tool in their development process. Game Swing added to this perspective by describing analytics as "another person in the

room who is unbiased".

Another thing that changed over time were the boundaries of the indie game development industry. While small teams were typically associated with arthouse games, the rise of the hyper-casual games industry in the last few years has seen small developers that approached game development in a completely different way.

> "That [Hyper-casual games], is all about just boosting the numbers and not about the game remotely. It's more like an exercise in optimising those analytics numbers" - Game Swing

As per SomaSim, even the indie community has become much broader than it used to be. Apart from there being more of them, indie studios range from small 1-2 person studios to mid-level studios backed by publishers to studios with multi-million-dollar budgets. Further, a number of indie developers have and continue to experiment with F2P games in the mobile space in search of new audiences and revenue. For example, Game Swing is currently working on a F2P racing game, and Blindflug is exploring how they can launch one of their early premium games as a F2P game.

We will later discuss in more detail how, over time, developers have gained greater insight into what types of games benefit from analytics. As Game Swing mentioned, when starting their car game project, they understood the importance of the role analytics would play in the project, and they set aside time and resources to educate themselves in the field. While Other Tales were short on resources during their first project, after experiencing growth, they indicated interest during their interview in putting more effort into strengthening their proficiency in the field of analytics. As the indie space continues to mature and grow larger, so do the companies' approach to analytics become more nuanced.

3.3 Ethical Implications Of Analytics

As companies become more experienced with game analytics, a particular concern becomes increasingly important to keep raised, the

ethics of game analytics. When asking questions about *what* sort of information can be gathered and *how*, there is a good chance that a vitally important question gets overlooked: *Should* the information be gathered?

3.3.1 Data privacy

Collecting game analytics and its telemetry follows the same logistics as any other form of data collection. If not properly stored, the data can be susceptible to data breaches and lead to sensitive user information being leaked online. In 2019 there were a total of 1,473 verified data breaches in the US, resulting in over 164 million sensitive records being exposed (Johnson, 2021). A data breach within a company is always serious. However, having personally identifiable information exposed is especially acute as it violates data protection laws and leads to heavy fines. According to the EU's General Data Protection Regulation (GDPR), an enterprise may receive a maximum fine of 20 million euros or 4% of its global turnover, whichever is higher, when found in violation of their regulations (European Union, 2017).

Small studios usually lack the resources for a deep dive into these legal aspects and as a result, become sceptical about using analytics at all. As Other Tales pointed out, one of the reasons for not activating analytics collection provided by the Unity Game Engine was to avoid breaking GDPR laws inadvertently.

> "The GDPR laws just started, when we released our first game, or just before release, I think. And that, then that kind of put us off (...) there's some automatic unity analytic thing that they had a while back. And they're like, okay, now we just have to uncheck that thing. So we don't accidentally do something weird." - Other Tales

Even when the law itself is not broken, company values and ethics often put developers at odds with game analytics. Kitfox mentioned how they could not afford to build in-house analytics tools, as is the case with most indies, but were averse to third-party analytics in part because they did not want their player data to potentially be sold.

There are various ways to attempt to prevent a data breach from occurring, including reviewing the security standards followed in the case of using third-party software or hiring cyber-security professionals in the case of creating in-house solutions. However, the most effective protection is to avoid storing any data that might be linked to users, including but not limited to: names, emails, addresses and in some cases even usernames.

3.3.2 Analytics for good or evil?

The analysts' intent is important when considering whether data should be collected or analysed. One way analytics can be useful is for analysing players' purchasing patterns. Done correctly, the benefits can be mutual for both the developers and the player. Insight that is gained can be used to maximise player enjoyment and thus increase the incentive to purchase in-game perks and watch advertisements. This can lead to a welcome influx of cash flow for companies. An over-indulgence into this practice however, can lead to predatory patterns in which players are excessively manipulated into spending large sums of money and preying on people at risk of gambling addiction.

One such pattern which has been in the limelight recently, are so-called loot boxes. Loot boxes are a type of micro-transaction, consumable items which unlock a randomised set of in-game perks upon opening. Recently this mechanic has been compared to gambling, which has raised concern for people susceptible to gambling addictions. Studies seem to show a link between loot box engagement and problem gambling within young people (Kristiansen & Christine Severin, 2020), which has led to some countries like Belgium to start classifying loot boxes as gambling (Gerken, 2018).

Another potentially abusive use of telemetry is to share or sell behavioural telemetry with outside sources, such as marketing firms. This is especially true (and illegal) in the case of user-identifiable information. The data can be used by other sources to model behavioural patterns such as habits and hobbies to target advertisements more accurately. Facebook has been near-universally panned for its aggressive data collection and has faced serious allegations of misuse of said data, especially regarding how they share their data with other companies

(Dance, LaForgia & Confessore., 2018).

As of yet, there is no widely agreed-upon standard that addresses the ethical and privacy concerns of game analytics. However, there are other codes of ethics such as the Web Analyst Code of Ethics, which are applicable to game analytics (Seif El-Nasr et al., 2013, p. 30).

3.3.3 Analytics done better

None of this is to say that companies should avoid collecting telemetry altogether. Nowadays, most third-party tools include documents detailing how their tools can be used in accordance with GDPR and have built-in features that partially ensures that data is handled correctly. Blindflug touches on this in their interview. By taking the necessary precautions and adhering to data protection laws, indie developers can use analytics as a tool for learning rather than for malice. As a bonus, Game Swing had an interesting perspective on the subject of data privacy: The act of watching players over their shoulders during in-conference playtests can be equated with collecting telemetry, but does not have the same negative connotations game developers may associate with data privacy.

> "(Collecting telemetry) is kind of the same as looking over the shoulder of a player playing at a conference but it's just in a more quantified manner" - Game Swing

If developers can confirm the protection of users' data through the company's analytics platform of choice, the benefits considerably outweigh these concerns. In the following chapter, we discuss how game developers can make use of these tools in a variety of ways.

4. Types Of Analytics

The world of analytics is enormous, it seems that every company has their own unique techniques and ideologies regarding analytics' utility. The open-endedness of the field can make getting started with analytics extremely daunting. In this section, we aim to help those intimidated by analytics by describing 3 different types of analytics that we identified through the interviews. This includes giving examples of data

tracked and how each analytics category may be useful to a company.

4.1 Behavioural analytics

Sometimes referred to as gameplay analytics, behavioural analytics refers to data that can be used to analyse in-game player behaviour. This data is typically used to identify ways to change a game, as explained by Flamebait's description of analytics:

> "(analytics is about gathering) data that helps you understand player behaviour and then you want to use that data to understand the behaviour so you can fix issues that the players are encountering".

Examples of behavioural data points include: Player position, finishing a level, interacting with a Non-playable character, jumping or shooting a gun. When used in game specific contexts, such information can be invaluable for improving the game's user experience.

Kitfox gave a good example of using behavioural analytics to improve game design. In their game, *Moon-hunters*, they tracked player deaths by different character classes available in the game. Kitfox discovered that the death rate for one of the classes was much higher than the others. Digging further, they also discovered that an inordinate number of deaths were registered to a single level. Using this information, Kitfox rebalanced the design by making the class more durable and reducing the number of enemy encounters on the level in question.

Behavioural analytics are inherently difficult to standardise as much of the data collected is specific to a particular genre, or even a specific game. Counting the number of coins collected is unlikely to apply to a First Person Shooter, though it does for a game like *Super Mario Bros*. Some behavioural data is more universally measurable than others. Game progress is a useful measurement that applies to most games, though the specific way to measure it can differ. Puzzle games might measure completed levels whereas RPGs might measure level-ups or completed missions. Game progress is particularly useful for constructing progress funnels, which measure player drop-off between progress milestones. All games are expected to have some drop-off

between milestones, but a sudden decline may indicate that there is a problem with the game.

Flamebait's *Verlet Swing* has a good example of using progress funnels. The number of players' retries per-level were tracked over the course of several beta tests. This information gave the developers a sense of each level's difficulty, which allowed them to shape the difficulty curve of the game more easily by changing the levels' order of appearance.

4.2 Business analytics

Business analytics refers to the process of using analytics to make informed business decisions. This definition can be applied to different contexts in order to create sub-groups within business analytics, e.g. marketing, supply chain and healthcare analytics. Arguably, business analytics have little to do with game analytics as they are not at all specific to games. In our interviews however, we came across 2 sub-groups that seemed particularly interesting to discuss in relation to game analytics: retention and marketing analytics, as both types of analytics can be of particular value for game companies in certain situations.

4.2.1 Retention analytics

With the rise of F2P games, measuring player retention has become a thoroughly established practice. As Game Swing noted about their experience in the mobile business, retention analytics are so widely used that publishers require them. Retention analytics revolve around data that measures how long and how often players play a game.

Example metrics include: Daily/Monthly Active Users, which measures how many users play daily/monthly and Day 1/7/30 rolling retention, which measures the proportion of users that return to the game after a specified day or later. The universality of retention means that its analytics are easily accessible. Storefronts such as Steam, Google Play store and Apple store all offer these metrics by default as well as most analytics tools automatically implementing them.

As SomaSim noted, the reason retention analytics has such a strong connection with F2P games is that revenue is tied to how long users

play the game. Users who only play a game for a few hours are much less likely to make in-game purchases than users who visit the game daily.

4.2.2 Marketing analytics

Marketing analytics involve analysing market data to identify things such as how successful the marketing is, where users are coming from and what their profiles are. This can help to realise who your target group is and help shape your game as you learn which users respond most to your game.

Metrics include: Referrals (where new users come from), cost-per-conversion (cost of converting a person into a player), advertisement impressions, store page visits etc.

Other Tales mentioned a case where they used marketing analytics to identify the age range of users that played their game, *Tick Tock: A Tale for Two*. The range was much wider than expected, with their demographic starting below 18 and rising above 65 years old.

4.3 App health analytics

The final type of analytics we identified from the interviews is app health (or stability) analytics. App health analytics relates to anything that concerns the stability of a game. A large portion of this type of analytics is covered by tools called crash analytics tools, which gather data about game crashes that occur for users.

Depending on the tool, the information gathered can be: Platform used, hardware specifications, game version and code that caused a game instance to crash.

As noted by SomaSim, this information is vital when launching a game or subsequent updates to it. The information gathered can be used to analyse whether the game is unplayable for a section of the player base or whether any changes to the game caused the game to start breaking.

5. The Indie Approach To Analytics

In contrast to the indie industry, the AAA industry has spent a good amount of time and resources in integrating analytics into their development process over the last couple of decades. I/O Interactive conducted a study of player behaviour through weapons usage metrics in *Kane and Lynch: Dog Days* and the use of player death heatmaps to tune difficulty for *Tomb Raider: Underworld* (Drachen, Connor & Rau Møller Sørenson, 2018, pp. 293-313). Microsoft Game Studios conducted a study of long-term player behaviour to understand the usage of various game modes and features in *Project Gotham Racing 4* (Hullett, Nagappan, Schuh & Hopson, 2012, pp 89-98). Many other examples of the utilisation of analytics in AAA games to aid design and development are present in published literature.

However, there is a dearth of documented case studies of analytics usage for indie games, and for good reason. While Indie game developers are more open to game analytics now than a decade earlier, there are some unique challenges that they encounter due to the nature of indie game development. In this section we discuss the challenges faced by the participants over the course of their indie journey, and how they have found ways to work around them within the constraints of indie game development.

5.1 Overcoming Limited Resources

By far the most common problem cited by the participants was having limited resources to dedicate to analytics. People within indie studios often have multiple responsibilities, juggling disparate tasks ranging from production-related work to accounting. Since they must prioritise their work in order of necessity, analytics often end up falling by the wayside or being ignored altogether.

This is especially true for companies that have limited or no previous experience with analytics. Learning to set up telemetry collection and interpreting the information can feel heavy when the benefits are not clear from the start. This was reflected in Other Tales' and Something We Made's interviews, with both stating that the time investment was a large obstacle to trying analytics, with Something We Made adding: "I

don't think there's a lot of value (in analytics) that would actually affect our decisions".

As companies' experience with analytics grows, they learn to squeeze more from analytics through the adoption of smarter research methods. The more experienced participants also indicated that over time, they learned the suitable use-cases for analytics, which could be based on the genre or the business model of the game.

5.1.1 Picking the right research method

One of the most interesting patterns to emerge from the interviews was how companies' approach to analytics evolves over time. Generally speaking, analysis of telemetry can be broken down into 2 methods: Exploratory and hypothesis-driven research (Drachen & Connor, 2018, p. 345). Exploratory research revolves around exploring a dataset with the goal of finding useful leads or patterns. With this method, researchers set up tracking of any analytics that may seem useful. This is a time consuming and often daunting method as researchers wade through large amounts of data to identify useful patterns, without the promise of ever learning anything valuable from a production standpoint. Hypothesis-driven research focuses on confirming (or refuting) a specific idea that researchers might have. Kitfox and Flamebait's earlier-mentioned examples of behavioural analytics usage are examples of hypothesis-driven research. With this method, researchers typically decide what to track based on what data relates to the chosen hypotheses.

Flamebait, Kitfox and Game Swing all independently described similar journeys of starting with an exploratory-based approach and moving towards creating specific questions or hypotheses as they became more experienced. In their earlier experiences with analytics, they initially tracked as much data as they could.

> "I would say in our first game *Shattered Planet*, we were following the mobile philosophy a little bit more where we were gathering more of the funnel stuff. And had this list of standard analytics people recommended. And it was a little bit more like a kitchen sink." - Kitfox

This seems like a fair approach - one can simply move past the information that is less useful and focus on the interesting data points. In reality, a large amount of information can easily overwhelm the researcher and make it difficult to identify which data points are useful and which are not.

> "We thought it would be good to just have some analytics in the game, so we could later find out the patterns but that didn't work so well, for us, at least we haven't looked at our data in a broad spectrum and done anything with that". - Game Swing

Simply tracking measurements for the sake of tracking them is a near-guarantee that they won't be used, as companies don't have the resources to analyse data for long stretches of time with the hope that something valuable gets discovered. Each company realised this and came to the same conclusion that in order to utilise analytics, they had to have specific goals for each of the tracked metrics.

> "The data doesn't have any value by itself. It's how we can use it that determines the value and sometimes it's just cumbersome having a ton of data all over the place" - Flamebait

Hypothesis-driven research has various benefits over exploratory research, especially for companies with limited resources: creating questions and deciding metrics beforehand allows for guaranteed and quicker results. The required steps for reaching answers have already been laid out, minimising uncertainty. This also results in minimal time spent looking at raw numbers. SomaSim mentions this, stating that they dedicate as little time as possible to analytics, instead optimising for time spent and extracting only the most important information.

5.1.2 Evaluating the need for analytics

Data-driven decision making can come across as an extremely attractive proposition, but it can also lead to wastage of resources, especially when it is treated as a sole authority.

> "you believe in stuff like absolute truths and there'd always be one correct answer. You've relied [sic]to authority way more and stuff like that, and in some sense, analytics kind of become that authority. And then it becomes easier at that stage for us to look at data and just say, this data says this, therefore, we must do this and just not, like, reflect on it and try to prioritise and stuff like that" - Flamebait

SomaSim recounted having worked on a game previously where five different tutorials were created and analysed with analytics. This was done to verify assumptions regarding the quality of the tutorial. While they eventually verified their assumptions, they felt that the time spent could have been utilised better.

> "In a certain sense, it's good to have numerical confirmation of your intuitions. But in another sense, it can also send you down the path of 'Oh, yeah, we just spent N weeks on verifying our intuitions. We could have spent those weeks on something else." - SomaSim

It is, thus, imperative for studios to evaluate the need for verification by analytics for a given problem in terms of its value proposition. It is entirely possible in a given situation that the best way to use analytics is to not use them at all.

5.1.3 Evaluating the type of analytics

Apart from evaluating the need for analytics, it is also important to consider how useful the different types of analytics are in relation to the game being developed. SomaSim pointed out the universal value of app health analytics, but the differences introduced when picking between premium or F2P business models, AAA or indie companies and genres of games all necessitate different types of analytics. In our interviews, the companies identified several factors that incentivize and de-incentivize usage of the different types of analytics based on their specifications.

Behavioural analytics: Any game can make use of behavioural analytics to improve any of its facets. However, they are best used to balance

existing mechanics and systems. None of the interviewees found analytics useful for discovering new game mechanics, but rather described behavioural analytics as a tool to tune previously existing ones. Multiple respondents stated that this is a hard sell for companies making premium games, as they don't necessarily care about fine-tuning every aspect of their game and usually want to start working on their next game as quickly as possible.

We came across two situations where behavioural analytics were useful: developing F2P and multiplayer games. Most of the studios mentioned at some point that F2P games were ideal for analytics, and behavioural analytics were no exception to this assessment. The F2P business model typically supports games for a longer time after release than premium games, meaning that F2P developers have a stronger incentive to keep fine tuning the game over a longer period.

The tuning aspect of behavioural analytics is perhaps most useful in multiplayer games, where balance is vitally important. In most cases, single player games can afford some unbalanced aspects of game play, as long as it is in favour of the player:

> "We are single player games. So we present the player with a world that they can mess around with. So it's much less important for us to make the game be fair, in a sense, because it's a single player game. It's inherently unfair. It's the player against the environment" - SomaSim

Multiplayer games do not have this luxury, however. If a character in a fighting game is much more powerful than every other character to the point of winning nearly every match, the game risks being considered bad. In these cases, numerical information like win rate, damage dealt etc. can be used to hone in on problematic aspects of a game.

Business Analytics: Due to limited budgets, the bulk of investment from indie developers goes into the development of games, leaving little or none for marketing. As a result, marketing analytics have been underutilised by indie studios. That said, the adoption of marketing analytics seems to have increased over the last few years, as more indie developers such as Other Tales see their value especially when engag-

ing in tactical marketing campaigns.

Retention analytics have not historically been considered particularly useful for premium games. This is reflected in our interviews with companies that develop premium games, only one of whom uses retention analytics in their game. When asked about the value of retention metrics for *Tick Tock: A Tale for two*, Other Tales mentioned how for a game designed for a single playthrough, it is more interesting for them to see if people are finishing the game rather than how frequently they come back to it. However, Blindflug brought up an interesting point regarding premium games and retention analytics:

> "(it has become apparent) in the Corona year that people would like to have more social, more multiplayer and more long-term games to play with friends. If you're looking at Among Us, at Valheim, at Fall Guys. All of these games, if they are a hit, are going into a live service direction. (...) It's something that I think indies need to learn to also incorporate and also monitor and try to find out what people like and what gets them coming back and trying to find fun mechanics that drive retention".

Blindflug also mentioned the rise of game subscription services, stating that, eventually, there could be a 'Netflix for games'. In this case, retention analytics will become important for premium games as service providers are more likely to purchase games that keep users on their platform.

In summary, indie developers can stay on top of the resource crunch issue by carefully defining the problem to which they are seeking a solution through analytics, understanding what type of analytics they can use to solve the problem, and assessing the value proposition of using analytics to solve the problem in the first place.

5.2 Assessing Analytics Tools

Another common challenge within indie studios is picking the right analytics tools to fit their requirements. This is especially true for companies that are starting out with analytics, as there are many options available and it's hard to find fair ready-made feature-to-feature com-

parisons of the tools. Using a framework for the evaluation of analytics tools, we can take a closer look at the state of current tools, their benefits, and their limitations. To do this, we borrowed Thomas Galati's framework for comparing analytics solutions (Galati, 2017, pp. 26-29). Galati's framework assesses analytics solutions based on a set of 6 parameters: Affordability, Shareability, Data Refresh Rate, Custom Data Analysis, Visualisation Quality and Customizability. We chose to simplify the framework into 3 parameters, as we felt that some of them were unlikely to influence decision making. The remaining parameters were: Affordability, Customizability and Visualisation Quality

5.2.1 Affordability

As we discussed previously, lack of resources is a constant challenge that indie developers grapple with. Developing in-house tools for analytics is not a luxury most indie developers can afford, and most studios who have experience with analytics tend to gravitate towards third-party solutions. The most common third-party solution that came up during our interviews was Unity Analytics.

This is in big part due to the ease of implementation of Unity Analytics into a game project - a barrier to entry that Unity has successfully tackled. The fact that a number of indie developers favour Unity as their game engine of choice brings them in close proximity to Unity Analytics, and starting it up is as effortless as toggling a switch inside the Unity editor. Doing so initiates the collection of various standard metrics, most of which fall under the retention analytics group. For many developers, it could be a worthwhile endeavour to toggle that switch to explore what intelligence they can glean from just the standard metrics.

As mentioned previously, standard metrics are often not as useful for premium indie games. As Other Tales pointed out, one-day and seven-day retention metrics, often regarded as core metrics to indicate the "stickiness" of a free-to-play mobile game, are entirely meaningless for their game.

To get behavioural indicators, developers have to utilise custom events, and the development overhead goes up as soon as those come into the

picture. Relevant events must be identified and coded into the game, requiring design and programming resources, making most third-party tools of limited value to indie developers.

Another aspect that affects affordability, specifically for indies making premium games, is that the business model of most of these tools is adjusted for F2P games. As SomaSim pointed out, a lot of tools charge the developers based on active users, which only makes sense if the game expects recurring revenue like with F2P games. Even if a studio finds a tool that works for them, it is entirely possible for the service provider to change their business model in the future to something that is not compatible, or worse, go out of business. This pushes the additional overhead of removing the tool onto the developer, as Kitfox experienced in one of their earlier games.

5.2.2 Customizability

> "What you often find is that the analytics solutions are optimised for web pages or mobile games. So they will do things like provide you with a JavaScript library, or they will provide you with an iOS SDK and an Android SDK. But if you're making a PC game, you know, good luck." - SomaSim

Since mobile F2P game developers are the bulk of the clientele for any major third-party tool such as Unity Analytics or Game Analytics, their dashboards are designed with the operation of F2P mobile games in mind. There is support for custom events, which can be used by indie developers to track game-specific data. However, it is limited in the sense of requiring a fair amount of development effort to get the relevant information.

Let's take the example of GameAnalytics (http://www.gameanalytics.com). The custom event (known as design events on the platform) only allows for a string and a numerical value to be sent as part of the event. This would force the developer to record two separate events should they want to record more than one numerical value for an event, or encode values in the string to send additional information. This makes both integration and analysis more time consuming, requiring companies to perform their own data processing.

However, it is important to acknowledge the business realities that third-party analytics platforms have to grapple with. As SomaSim, Kitfox and Flamebait rightly stated, indie game developers typically do not operate with the same number of users as F2P mobile games, and neither do they have the deep pockets to be considered an attractive target for business by third-party companies. For this reason, the creators of analytics tools tend to gravitate naturally towards the requirements of the F2P mobile games companies, which form the bulk of these companies' clients.

5.2.3 Visualisation Quality

Developers with prior experience mentioned that data visualisation is limited for custom events on most dashboards, which means that they would need to devote a considerable amount of time processing the data to gain actionable information. The reasons for this can again be linked to the business potential of indie studios from the perspective of third-party tools. Putting that aside though, custom data is often extremely unique to each game, which makes it hard to build an off-the-shelf tool that can visualise such varied forms of telemetry.

> "Pure gameplay questions are very niche. Like my fish question in biomes? Maybe there could be an easy pre-prepared tool that could give me the overview that I want. But maybe also not. Because if we're talking economics, sometimes the questions are really complex" - Blindflug

This was echoed by Flamebait, who also felt that it might be too complex to build a common tool to cover the wide variety of requirements for behavioural analytics for different genres.

Another potential issue with visualisation, especially for developers new to analytics is information overload. When speaking of their initial experience with Google Firebase, Game Swing mentioned how the interface can often blast you with numbers and charts when you're there to look at just one thing.
All in all, there are affordable and easily accessible tools that are available for indie developers to try out, but there are enough limitations that would require the investment of time and effort from the develop-

ers to get the most out of them.

5.3 Analytics on a budget

Concerns with tools notwithstanding, developers have invented ways to collect data on a 'budget' i.e., with minimal effort and within a limited context. Every major platform (Steam, Playstation, Xbox, Apple, Nintendo etc.) supports achievements in some form. Depending on their implementation, achievements can reveal valuable feedback on player behaviour. For example, if the game awards achievements for each level completed, the completion statistics of these achievements can effectively work as a progression funnel. If the developer sees a major drop off between certain achievements, it can hint towards a potential bottleneck in the progression. Flamebait had an interesting example of this: in their first game Passpartout, the story branched out into two possible scenarios depending on player actions. While looking at the achievements, the studio discovered that 70% of players went down one path whereas only 5% of players went the other way, leading them to identify balancing issues as they expected the players to be evenly divided between the two paths.

As Kitfox pointed out however, there are certain limitations to this method of data collection. For one, the studio must be willing to use achievements for this purpose, which risks cheapening the achievements overall if used too much. Another problem is that achievements provide limited information. The information gained from achievements is binary, which means that an analyst can only tell if an achievement has been unlocked or not. Developers don't have the option to attach additional information to the achievements, such as how much time, how many sessions or how many attempts it took to unlock. Without the context of player experience, the data might not be actionable.

With the addition of using achievements, developers can use showcases and game conferences for 'budget' analytics to good effect. At conferences, the game usually gets exposed for a short time, but to a large audience. Kitfox used this to their advantage for their recently released game, *Boyfriend Dungeon*, where their demo at PAX had three characters to choose from. Wanting to know which character was most popular, the development team implemented a simple system which

would record which character each player chose and save to a text file on the demo computer. Since the data was being gathered over the event, a fast and loose solution was entirely valid.

While these methods are not as well-organised and scalable as dedicated middleware, they can nevertheless prove to be unique opportunities for indie developers to start building familiarity with data collection and analysis on a small scale.

5.4 When To Implement Analytics

All the developers we spoke to viewed analytics as a late development or release build tool. Analytics is viewed as a tool to collect data out in the wild, one of the biggest reasons being that you require a large enough sample to validate the findings from any data. Does that mean that analytics have no role to play during early- and mid-development?

Games User Researchers argue that analytics can be an excellent supplement to qualitative technique, allowing studios to effectively triangulate the different methods to provide answers to questions that are otherwise impossible to ask (Seif El-Nasr et al., 2013, p. 45). Lynn (Lynn, 2013) covers in detail the user research on *Red Faction: Guerilla* which was a combination of playtests, interviews and analytics. One of the many examples stated in the paper is the use of analytics to triangulate an issue flagged by testers during their interviews. If a tester flagged a level as being "too difficult", the researchers used the frequency of relevant events to arrive at the potential cause of perceived difficulty. Analytics can also help the researcher save time during analyses. For example, recording the play session is a common practice during games user research. By recording events relevant to the studied issue, the researcher can focus on those specific parts of the play session rather than the whole.

Previous research suggests that analytics can be useful in the early stages of development. However, none of the indies we spoke to were using analytics to supplant their early-stage qualitative testing, with one exception in the case of Kitfox who used conference testing to record an event on the demo computer while showcasing their game. This is probably due to the aforementioned resource crunch that in-

dies perpetually face, rather than them not seeing value in the utilisation of analytics during early development. Bigger studios with access to full time user researchers and support systems are in a much more comfortable position to experiment with analytics during the early stages of development.

6. Conclusion

Even though analytics have gained a lot of prominence over the past decade, they pose multiple issues that indie developers grapple with. The lack of resources, weak synergy with third party platforms and ethical considerations often causes indie developers to either stay on the fence or adopt analytics in a limited way. Further, analytics are more suited to certain genres and business models than others, which limits its use further.

Despite compatibility issues and concerns, the indie industry's perspective on analytics has changed over the past decade. Based on our conversations, it is decidedly softer, and indie studios are either exploring or keen to explore how analytics can help them improve their games and businesses.

Based on previous companies' exploration and experience, we would like to conclude with a few things that indie developers can keep in mind when starting out on their journey with analytics.

Hypothesis-driven approach: Indies with previous experience of analytics all had a similar trajectory in their approach to data. Over time, they moved from collecting as much data as possible to gathering specific data that would help inform solutions to specific problems. Having a clear purpose for analytics and collecting data accordingly will help developers avoid an information overload which is not only unnecessary but can often also obscure useful data.

Finding the right fit: Marketing analytics and app health analytics can benefit indie developers irrespective of their game genre or business model. However, other types of analytics may only be useful to some developers. Behavioural analytics are critical while making multiplayer games. Similarly, tracking retention analytics is imperative if the game

uses a F2P business model and relies on returning users for revenue. Just as it's important to know where analytics can help you, it is equally important to know where they can't.

Analytics on a budget: Many of the developers highlighted the start-up cost, learning curve and recurring effort required for using analytics. Developers can figure out creative ways to get a taste of analytics and experience the value they can potentially bring to their business. Some of the ideas suggested by the interviewed developers were using achievements as proxy analytics and using conferences and showcases for spot data collection.

Moderation in data-centricity: Over reliance on analytics can lead to a net-negative time investment. As many of the interviewed developers pointed out, time investment to get the data as well as tunnel vision due to overreliance on data can put pressure on both time and resources and may feel especially pointless if intuition pointed the developer in the same direction. Over time, developers should build the capability to know when to rely on data to make decisions, and when it can be faster and cheaper to arrive at a solution through intuition and trial-and-error.

Analytics have steadily gained relevance in game development, with more and more indie developers bringing them into the fold of their development process. Over the last decade, smaller companies have applied various approaches within their limited means and have found ways to extract value from Analytics over a wide range of use cases. As third-party tools become more sophisticated, and best practices are constructed through documented case studies, we expect to see new and increasing usage of analytics by indie studios. As the democratisation of game development continues, our endeavour through this chapter has been to add to the growing library of literature on the subject of analytics. More particularly, we hope to demystify game analytics for small developers and encourage them to experiment with this often-vital source of data.

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Chapter 6

What Medical Research Can Teach Us About Playtesting

Wilmer Tjernberg

Abstract

Participant recruitment is an essential, but rarely explored, part of conducting good games user research. This chapter examines potential factors influencing people's ability to participate in the playtesting of games, highlighting current problems within the area and asking questions about what is assumed about participants. I argue that explicit and implicit choices about how playtests and playtesting spaces are designed can exclude many people from participating and create a lot of potential issues. In many cases, these choices can be blamed on a lack of thought given to recruitment processes. One field of research and practice that by necessity requires a lot of thought and extensive methodological refinement is medical research, and this text draws on knowledge from that field (as well as intersectionality theory) to discuss the problems games user research faces and what we can learn from looking outside the games industry.

Keywords: games user research, playtesting, medical research, intersectionality

1. Introduction

Playtesting is an integral part of games user research. Many companies have dedicated spaces for playtesting, or "labs", where hundreds of players (or "playtest participants") are brought in over the course of a game's development o test the game and provide feedback. Installments

in the long-running sci-fi series *Halo*, for example, have been playtested since the early 2000's (Thompson, 2007; Leone, 2012). One integral aspect of making these testing procedures work is successful recruitment of participants. A common approach is to reach out to players within a game series' community, as it's resource efficient, quick, and can provide "high-level" feedback. But there are limits to this type of recruitment, and in order to uncover completely new issues with a game, finding 'fresh' participants can be essential. There are many potential factors influencing people's ability to participate in playtest sessions, however, including geographic location, available time and resources, and knowledge of the playtest occurring.

Despite these factors having a potentially big impact on participation and gathered data, there is a lack of writing on the topic in the context of video games. This is disappointing for many reasons, not the least of which being that the little work we do know about is both innovative and shows a lot of promise. Hillman, Stach, Procyk and Zammitto (2016), for example, decided to recruit a sample with wide geographic representation of their target audience when studying the hockey game *NHL 16* (EA Vancouver, 2015). Hockey culture can vary extensively from place to place, and by utilizing remote participants they could look beyond just the famously hockey-loving Vancouver - where they were based - to better understand their players in other areas. This helped ensure that their sample was representative of their player base, making it more likely that their findings would be relevant to what actual players thought and wanted.

The lack of information may be due to the secretive nature of game development, with both developers and playtest participants often having to sign Non-Disclosure Agreements (NDA:s) preventing them from discussing the games they are involved in. All playtest participants for *Halo 4* (343 Industries, 2012), for example, had to sign such agreements and were reminded by staff that what they saw had to remain secret, as the game had not been released when they participated in playtests (Leone, 2012). More than that, the actual test processes that companies use are more or less industry secrets, with generally only snippets and general tips being shared in the occasional article or conference presentation.

The medical field, in contrast, emphasizes transparency and contains many studies on barriers to research participation (e.g. Newington, Metcalfe, 2014). The fields of game user research and medical research differ quite a bit in focus area and goals, but I argue that general lessons can be applied from one to the other. This chapter presents an overview of literature from both fields, drawing connections between the challenges faced by medical researchers and games user researchers. During the two literature reviews that were carried out, the concept of intersectionality emerged as particularly relevant, appearing in discussions related to both medical research and human-computer interaction.

This is not intended to be a step-by-step method for improving GRUX practices, nor is it a guide to any one specific methodology. Rather, it is meant to highlight some methods and ethical considerations from medical research that might be of value to GRUX at large, as well as highlight issues with contemporary GRUX participant recruitment in particular. This is not to say that medical research has perfect solutions for the many problems discussed in this chapter (cf. Yancey, Ortega, & Kumanyika, 2006). However, there is plenty of valuable insight to be gained from looking at discourse within the medical community, and how practitioners have dealt with challenges similar to those facing GRUX practitioners today.

2. Framework of understanding

To discuss how medical research can be applied to video games, some context about the field is necessary. Even though GRUX should not necessarily hold itself to as high standards as medical research – unlike that field, actual lives are not at risk in GRUX - there is still a lot to learn from these 'extreme' examinations.

2.1 Medical research

From my own readings and experiences as a GRUX worker, there is often a lack of thought given to recruitment processes. Convenience sampling can be a valid method in many cases, but it's used so often that it risks being a crutch that limits what types of participants are being represented. Many studies are carried out with college students, fans of

the game being studied, or sometimes both. One field of research and practice that, by necessity, deliberates on recruitment processes – and the ethics of handling participants - is medical science. Practitioners in this field cannot afford to do approximate, use ad-hoc methods, or treat participants haphazardly. Medical researchers also cannot rely on sloppy recruitment processes; to understand new medical procedures, they need to ensure that the procedures are tested on samples that are representative of as many people as possible, not just the ones that happen to be closest.

Medical research is widely recognized for making significant discoveries and helping develop a variety of treatments, leading to remarkable improvements in health care and public health. The field is not without its issues, however. As Yancey, Ortega and Kumanyika write in "Effective recruitment and retention of minority research participants":

> "Our ability, as leaders in public health scholarship and practice, to achieve and measure progress in addressing racial/ethnic disparities in health status and health care is severely constrained by low levels of participation of racial/ethnic minority populations in health-related research." (2006, s. 1)

In a report about the benefits of research for health care, Levit, Nass, and Gostin (2009) posit that cultural, linguistic, and socioeconomic barriers could be responsible for the low rates of medical research participation among racial and ethnic minorities in the US. Other suggested factors include a lack of access to, and strong distrust of, the medical research community compared to the general population, as well as recruitment techniques that are ineffective for minority populations.

There is also gender bias within medical research, as Anita Holdcroft (2007) writes:

> "The evidence basis of medicine may be fundamentally flawed because there is an ongoing failure of research tools to include sex differences in study design and analysis. The reporting bias which this methodology maintains creates a

> situation where guidelines based on the study of one sex may be generalized and applied to both."

These issues have created a need for new approaches to conducting and analyzing medical research. One of the more prominent theories for addressing issues of inequality within medical research has been intersectionality.

2.2 Intersectionality – the nuances of participants

The term 'intersectionality' was first proposed by Kimberlé Crenshaw in the late 1980s. In her article "Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics" (1989), Crenshaw discusses the problematic consequences of treating race and gender as mutually exclusive categories when it comes to understanding the lived experiences of various populations. Crenshaw describes intersectionality as "a way of thinking about identity and its relationship to power." While originally articulated on behalf of Black women, intersectionality has since grown to include other peoples who "face vulnerabilities that reflect the intersections of racism, sexism, class oppression, transphobia, able-ism and more", giving many marginalized communities "a way to frame their circumstances and to fight for their visibility and inclusion." (Crenshaw, 2014)

It is not difficult to find articles on applying intersectionality theory to medical research. Abrams et al. (2020) write that intersectionality has implications for study design, sampling, data collection, and analysis within qualitative medical research, and argue that the theory is well-suited to empowering participants, shifting and expanding vision and focus, as well as holding researchers accountable for critical inquiry throughout the research process. Wilson, White, Jefferson, and Danis "extrapolate general strategies for applying intersectionality to the clinical context" in their article "Intersectionality in Clinical Medicine: The Need for a Conceptual Framework" (2019), making the case that "clinicians must recognize that to fully understand their patient, they must expand their preparation and know about a larger set of influences that may affect a patient's response to illness and the possible ways to treat it". As stated earlier, intersectionality theory covers a large

variety of peoples. In the article "An intersectional approach to Men's Health" (2012), Griffith writes the following:

> "Intersectional approaches help to consider why and how the combination of socially-constructed identities and characteristics create new norms, expectations, masculinities and, ultimately, health outcomes [...] Intersectional approaches offer a way to consider why gender and masculinities are related to health and these approaches help to identify key pathways and stratification variables to guide future research."

Discussion of intersectional ideas have also begun to appear in game design and research spaces. Rankin and Irish (2020) involved black female college students in the design and playtesting of a language-learning game, applying the intersectional Black Feminist Thought (BFT) theory as a critical framework for the design process.

3. Factors affecting playtest participation

As stated earlier, playtesting is an important part of the games user research process. For some games, it may be the one of few times during development that prospective players get to interact with it before it's released, allowing them to share feedback that can help improve the final product. In this section, I will discuss some limitations with the way playtests are planned, designed, and executed, with a particular focus on recruitment and the treatment of participants.

3.1 Socio-economic geography

Many playtests are carried out on location in dedicated playtesting spaces or labs. These spaces are often situated in tech hubs and major cities, where many of the companies doing user research have their offices. A glance at Electronic Art's list of global playtest labs shows locations in major cities like Stockholm, Melbourne, Seattle, and Montreal. Santino Garcia (2019) specifies that Activision's playtesting space is in Los Angeles, which is also home to game companies like Riot Games and Sony Interactive Entertainment. 343 Industries, the current developers of the *Halo* franchise, have their offices in Redmond,

Washington. In short, the places where many major game developers are situated are often expensive metropolitan areas.

3.1.1 Limitations

Holding on-site playtests in a physical lab naturally – and obviously - creates a situation where participants who live closer to the lab will have easier access to it than those that do not. Simply looking at geographical proximity is a fairly simplified view of laboratory access, however. In "Using Intersectional Feminist Frameworks in Research", Marika and Bunjun (2007), for example, argue that geographic location is a factor that interacts with gender, race, indigeneity, immigration status, ability, sexuality, identity, and income. Tech hubs and major cities generally have higher costs of living than rural areas, for one thing: PayScale estimates that the cost of living in Los Angeles is 43% higher than the national average for the United States (u.d.), while Redmond is 48% higher. Taking Marika and Bunjun's research into account, these economic factors are but one variable that affects the population of a city. Simply put, Los Angeles and Redmond will have a skewed demographic that is not representative of other places in the US. The implications this has for playtesting demographics quickly becomes apparent. Activision's Santino Garcia, for example, recommends against including participants who live far from the playtesting space, as having to travel a long distance could affect their energy and mood which could in turn have an impact on their play experience and feedback (2019). They note that what constitutes long distance will vary from city to city, specifying that their team limits their participants to those living within 50 miles of their Los Angeles playtesting space.

In medical research, this type of process is referred to as *convenience sampling* or *opportunistic sampling*. Only including participants who live in or near these major cities where the studios are based runs the risk of leaving out vast amounts of people. It raises questions of what insights are being left on the table, and what communities are not being heard.

Los Angeles is an interesting example, as factors including the city's low density, access to oil, and decades of automobile-focused lawmaking has also made it famous (or infamous) for being very car-centric (Novak,

2013). Blumenberg and Ong (2001) explain how the city in many ways lacks accessible and reliable public transportation for many inhabitants, particularly low-income individuals. A full examination of the historical, socio-economic, and even racial implications and effects of this are far beyond the scope of this text. However, the city is a useful example to show some of the many factors at play for even something as simple as who has physical access to certain spaces or not.

Even for those living within "geographic range" of playtesting spaces in Los Angeles, transportation can be a major concern. If we turn to medical science, this issue has been heavily researched, and its impact on participants and research outcomes are well understood. In their study on recruitment of African American participants for medical research, Wyatt et al. (2003) identify lack of transportation as a barrier for study participation, which heavily skews the participant pool for clinical experiments, resulting in non-representative outcomes. Newington and Metcalfe (2014) write about the difficulties of recruiting patients who had to travel to London from other parts of the United Kingdom. Patients found long travel times off-putting, especially for those who worked and were unable to take extra time off for appointments: "you can give them their travel expenses, but you can't give them their three hours back".

3.1.2 Potential solutions

Remote playtesting is a potential solution to many of these problems, as it doesn't require participants to be physically present to playtest a game. This would allow participants not living near playtesting spaces to more easily participate, lowering the barrier to entry and potentially saving participants both time and money. Studies on remote healthcare provides some evidence to support this theory, with Chu et al. (2015) finding that remote urologic care saved their participants an average of 277 travel miles, 290 minutes of travel time, $67 in travel expenses, and "$126 in lost opportunity cost", while participants in another study on remote urology by Viers et al. (2015) saved an average of 95 travel miles, 95 minutes of travel time, $48 in travel expenses, and "1 day of missed work". It bears mentioning, however, that Chu's relatively lightweight method of self-reporting via smartphone may be easier to do remotely than, for example, acquiring hardware or installing

programs for playtesting. The saved travel time and money, however, still stands.

Remote testing has advantages not only for participants but for researchers as well, with Hillman, Stach, Procyk and Zammitto (2016) highlighting the value of remote participants in their diary study for the game *NHL 16* (EA Vancouver, 2015). All their user research studies had previously been conducted in a lab at EA's offices in Vancouver, and by going remote they were able to recruit a sample with wide geographic representation of their target audience. This allowed them to specifically target regions other than Vancouver, where hockey is immensely popular. Hockey culture, like with most sports cultures, can vary extensively from region to region, so only researching within one location could potentially create a knowledge gap in understanding the game's audience.

Some companies have embraced remote playtesting in recent times, especially due to the Covid-19 pandemic. Ubisoft Montreal began doing remote playtesting in September 2020, with team members checking that participants had suitable equipment and then letting them download free software to remotely connect to Ubisoft-owned PCs (2020). It remains to be seen if remote methods will play a larger role in games user research post-Covid-19.

Remote playtesting is a promising solution to some of the geographical challenges of playtest participation, but it is not a cure-all. It creates new and different challenges for both researchers and participants. While it does not require physical access to a testing space, it does require access to compatible hardware (such as computers, consoles or controllers) and in many cases a high bandwidth internet connection strong enough to establish a reliable connection to the developer's and the participant's PCs. Depending on what type of data researchers hope to gather, it may also require access to recording equipment such as cameras and microphones. Access to hardware and software, then, largely falls on the participants' shoulders. With enough budget and logistical effort, perhaps it would be possible to set up systems for lending participants the equipment they would need.

Carrying out remote research also creates new security and ethical concerns and might be more difficult to structure. Researchers will have far less control over the environment and conditions that the game is played under, which poses a risk of tainting the data. Louvel (2018) recommends making playtesting spaces as neutral as possible to not create bias, since being exposed to stimuli like game posters, developer logos, or brand merchandise may affect participants' mindsets, expectations, or even perception of the game they're going to play. Being biased in these ways could impact the validity of test results. This would be difficult to control in a remote setting - perhaps a participant will be primed to enjoy a game more because they are sitting in their home, in a comfortable chair surrounded by game memorabilia, or they could be annoyed because a neighbor is making noise while they play. Data could also be tainted by accidentally muted microphones, blurry cameras or any other technical errors that are out of the researchers' hands. Cristopher Chancey, CEO of indie developer ManaVoid Entertainment, explains how the pandemic has made playtesting a big issue.

> "We usually like to have sessions in-studio where we can actually look at the player's facial expressions in order to know if they're enjoying a specific sequence, feel frustrated, sad, angry, excited, etc. It's really hard to do online, plus there are security concerns having to send a build online to a potential playtester. We tried using third-party programs like Parsec to playtest our games, but the experience isn't always optimal and the results are then tainted." (Khan,2021)

Any potential audio or video recordings would have to be handled with great care, as they could contain sensitive information about participants and their living situations. Any playtesting conducted in the EU would need to abide by the General Data Protection Regulation (GDPR). In "GDPR: an impediment to research?" (2019), Clarke, Vale, and Reeves write that - among other things - "virtually any use of personal data, from collection and recording, to retrieval and dissemination, storage, and finally erasure or destruction, constitutes "processing", with significant accountability required" according to article 4(2) of GDPR.

An alternate method to remote playtesting (post-Covid-19) could be to go "on the road", with researchers setting up short-term testing spaces in different areas – much like what some medical workers do to serve patients in rural or otherwise underserved areas. Daiski's study on the Health Bus mobile healthcare unit (2005) found that accessibility to medical care for marginalized peoples could be improved by "providing expanded services at times and in locations convenient for them, such as on site through the Health Bus". While the Health Bus was created more to provide care than to diagnose or run tests, lessons from it could still be applied to research. A mobile games user research lab could create a best of both worlds scenario, combining geographic flexibility with the type of controlled experience only a lab can provide. Taking the playtest lab out of the office and on the road could be a novel way to get insights from players without access to playtesting spaces and could be especially useful for connecting with marginalized communities. Researchers could even draw participants from events like conventions, fairs or trade shows. Note that this last example is far from perfect, as conventions and trade shows also create participation bias - who attends these geographically locked, often expensive, events, some of which take place during workdays? Enthusiasts and other developers, most likely. It would also be difficult to create a neutral lab without distractions at these events, as they are often crowded and loud.

Simply put: it is important to take lab locations and accessibility under careful consideration when conducting games user research. Every geographic location, and testing process, has an impact on peoples' ability to participate in your tests. A first step in diversifying your playtesting population can be to ensure that playtesting locations are easily accessible through public transportation and other cost-effective modes of travel. This is a somewhat superficial solution, however, and more experimentation with novel testing methods are needed to tackle this problem further.

3.2 The practicalities of being a playtest participant

An article by Matt Leone about playtesting the game *Halo 4* (343 Industries, 2012) offers a glimpse into the reality of being a playtest participant – a *critical case*, if you will. The participant interviewed in

the article is evidently passionate about the *Halo* franchise, stating that they did not live nearby to the playtesting space in Redmond, Washington, but chose to drive out for the weekend and stay with a friend because they wanted to play the game (Leone, 2012).
After signing an NDA they proceeded to play the game for roughly seven hours, during which time they were observed both by the user research team and members of the development team tuning in via live feeds. The participant mentions trying not to think about being watched, noting how playing in a lab felt different from home. "[...] when you're playing at home you can get up sometimes, and you go get something to drink, to eat. Here's it's just you and the game." They also report feeling pressure to play quickly, so they could finish the game before the test ended. "You wouldn't go into a movie and leave three-fourths in and be like, 'I'll wait 'til it's out on DVD'". Each of the 18 participants that day, Leone writes, answered 884 survey questions before going home. For those seven hours of play and hundreds of questions answered, the interviewed participant received free pizza and "four gratuity items (a year of Xbox Live, an Xbox Live points card, Forza 4 and Alan Wake)" before being sent home.

Using rewards to encourage participation is not uncommon in games user research. The website for EA's playtest labs (u.d.) mentions "rewards" but does not specify what these rewards are, while Activision's user research page (u.d.) states that participants can receive gifts such as Activision video games, gift cards, apparel, and "other unique/exclusive swag". While these items have monetary value, there is no mention of direct payment, financial compensation for travel expenses or the like. One of Ubisoft's playtesting sites (u.d.) mentions that participants are "rewarded proportionally to the length of the playtest", with rewards including "cash, games, and more, depending on the playtest", but does not go into any more detail.

3.2.1 Limitations

Eating pizza and playing hours of video games may sound like an ideal weekend to many, and for some participants it may very well be. However, it does come with its own challenges. Seven hours is almost a full workday; participating in that many hours of uninterrupted play is asking a lot from participants. These demanding testing scenarios

create a sort of unavoidable, and significant, selection bias, likely leading to passionate players (those who are likely already fans of the studio or game franchises being tested) being vastly overrepresented.

Furthermore, having multiple hours of uninterrupted leisure time to spend is a luxury for many. Availability of leisure time interacts with gender, social status and other factors. An analysis by the Office of National Statistics (2018) showed that men in the UK enjoyed nearly five more hours of leisure time per week than women – a disparity that has grown wider during the 2000's. They also found that people who lived alone took more leisure time than people living with children. The amount of time required to participate was an important factor in Newington and Metcalfe's study on barriers to medical study participation (2014). Wyatt et al. (2003) noted that despite wanting to participate in medical research, not everyone was able to fit it into their schedules. Some had to take care of children and family members and many cited work schedules as a barrier to participation. Holding playtests during conventional working hours will thus severely limit who will be able to participate. Extra money for transportation, ability to get time off from school or work, or not having other responsibilities to tend to, are all fairly rarified commodities. So, once again, it is important to understand that the type of testing population you'll get is going to be heavily affected by your choices. Whether it's time of day, day of the week, or length of play sessions – all your choices will affect the type of players you'll ultimately end up seeing in your playtesting sessions.

Fair compensation is another important thing to consider in this context. If participants are spending their own time and money to participate in multi-hour playtesting sessions, it's only right that they are compensated accordingly.

3.2.2 Potential solutions

One way to make participation easier is to be flexible with playtest session scheduling and to offer weekend and evening times, which was suggested by Newington and Metcalfe to reduce the time burden of study participation. A Tweet from Brian Jarrard (2020), community director of the *Halo* franchise at *343 Industries*, implies that at least some of their playtests are carried out on Saturdays. Keeping

playtesting sessions short or spreading them out over several days or weeks could also help those with less free time, or those who would have trouble playing for several hours at a time.

Regarding compensation, a researcher that Newington and Metcalfe (2014) interviewed saw the need to explore "being able to financially help volunteers better". Gul and Ali (2010) write that compensation for participation "should be sufficiently high so as to encourage participation but not so high as to be coercive". A complicating factor is that payment might impact test results. Sarkar and Cooper (2018) found that paying players to participate in playtests on crowdsourcing platforms had a notable impact on their experience. Paid players completed a higher volume of tasks and self-reported greater engagement, while volunteer players completed fewer tasks, but at a higher quality level. Sarkar and Cooper point out that these different types of players may be good for different kinds of tests.

This is not to say that participants shouldn't be compensated for their efforts, just to preserve data integrity. Providing fair compensation is critical to not exploit participants. Volunteered labor is still labor. Paying participants, reimbursing travel and lodging costs and/or providing accessible transportation for participants are some ways to enable and incentivize participation, especially for those who would not otherwise be able to or interested in doing so. For example, offering childcare, especially on-site at the playtesting space, would make it significantly easier for parents to participate.

In Leone's article, Microsoft studio head Phil Spencer calls *Halo* a "three-billion-dollar franchise" and the "most important entertainment product in the company." Leone also notes the "$20,000 worth of art on the walls" in the company's playtesting space, which represent data from their years of playtesting. If there's that much money going into just the decorations, paying the bus fares for the playtest participants whose data adorns those walls and who helped the franchise make those three billion dollars surely can't be too hard. To their credit, it seems Microsoft has upped their compensation in the years since Leone's article came out. Their Games User Research division now offers hundreds of dollars as participation incentives, even specifying exact amounts in their recruitment on social media.

There are, however, some potential issues with too extravagant compensation. John Hopson of NCSoft writes that they try not to let participants know too much about how their recruitment works and the specifics of the compensation.

> "[...] there are players who will try to game the system. [...] Most studios give out gratuities for participating, some quite valuable. I've seen participants lie about their qualifications, submit themselves multiple times under alternate names, etc. in hopes of being asked to come in more often. If you're too public about your requirements, participants can reverse-engineer the criteria and contaminate your studies." (personal communication, March 23, 2021)

Researchers should aim to provide adequate compensation, but what this entails is likely to vary between participants and studies. At the very least, basic things like providing or paying for transportation and food on top of the obligatory game copy could go a long way. Giving out a game console or replica Frostmourne sword, on the other hand, might attract participants with the wrong intentions.

3.3 Critiquing the "typical" tester

A crucial part of recruitment is the initial step of establishing contact with potential participants. In their study on factors influencing recruitment to medical research, Newington and Metcalfe (2014) point out that in order for a potential participant to decide whether they want to participate in a study, they must first be invited to participate. Companies like Microsoft, Electronic Arts, Activision and Ubisoft all have websites where individuals can volunteer to take part in playtests. All four companies encourage participation from individuals who play games as well as those who do not, and these websites are also generally available in different languages. These companies also have dedicated accounts for user research/playtesting on social media platforms like Facebook and Twitter.

From an outsiders' perspective, it's difficult to say if these companies do any work to actively reach out and recruit participants, or if they rely primarily (or solely) on users who seek out their websites or social

media and sign up to participate. Santino Garcia, playtest recruiter at Activision, mentions using a database to create random samples of participants, presumably consisting of the volunteers that signed up via their website (2019). Glibert (2016) discusses some criteria for users in the playtesting of the game *Eagle Flight* (Ubisoft Montreal, 2016), including how easily they got motion sick, but does not otherwise discuss how users were recruited.

3.3.1 Limitations

If companies are mainly relying on self-motivated volunteers to actively seek out these sites and enroll, it's likely that this would heavily affect which types of participants they will get. While many of these companies make a point to be open to non-gamers, it seems unlikely that someone who is not already invested in games would both know that the sites exist in the first place *and* make the effort to go through the steps required to participate. Newington and Metcalfe (2014) noted challenges with identifying and accessing eligible participants for medical research, and even otherwise eligible participants may be denied the opportunity to take part. In their studies, several interviewees noted that those who did not speak or understand English could not participate in many studies due to a lack of interpreter and translation services.

Fundamentally speaking, it's important to ask the question: "Who do I think my playtester is?" In a presentation about playtest recruiting, Santino Garcia describes participants as "your consumers, these are the guys who are going to wait day of release to pick up your games." (2019) It sounds reasonable from a business perspective to playtest a game with its core audience, but how is that core audience defined? Could companies be missing out on fresh insights and players by not also looking beyond their traditional player bases and being more active in their recruitment, especially when it comes to underrepresented groups? Could mainly playtesting with fans and those who are already interested in the game create a feedback loop? Leone's Halo 4 article has a telling quote: "They're impressed with the diversity in today's test because four of the 18 participants are female." That less than a fourth of players identifying as female counts as impressive diversity raises questions about their pool of participants, which Leone notes

is pulled from a database of 60,000 volunteers (2012). Out of the 214.4 million video game players in the United States, 41% identify as women according to the Entertainment Software Association (ESA) (2020). Rankin and Irish (2020) argue that "too few studies examine the gameplay experiences of women of color".

Assumptions about "typical" testers, with its root in target audiences, is a complex topic, as it ties into everything from culture, identity, and interests to marketing and how these factors impact recruitment. Many game developers may be unknowingly exclusionary, simply because they haven't thought about many of the factors at play, or because they are not the ones making those decisions. Some, however, are very explicit about it. In a 2019 interview with Toshihiro Nagoshi, series director of the *Yakuza* game franchise, Nagoshi describes how he was surprised when *Yakuza* - aimed specifically at adult Japanese males - became popular with women and overseas audiences. He goes on to say that even though the fanbase of the series has expanded, he and the game's staff would not go out of their way to appeal to them. "If we start to worry about the female fans, it changes the identity of what we've worked on and we risk isolating the current fans [...] If we try and shift our formula to fit a new audience, Yakuza won't be the game we set out to make." (OTAQUEST, 2019) In a different interview with Famitsu (translated into English by Siliconera), Nagoshi goes on to say that "Currently, about 20% are female players. [...] While that is something to be happy for, Yakuza is something that is made for male players, so we will be careful not to be too conscious of the female users and derail from what we want to make." (SATO, 2016)

One can question what Nagoshi thinks female players are and are not interested in, and how that differs from the male fanbase and the current content of the games. Choosing to actively ignore a fifth of your playerbase is certainly a curious decision – even more so when the games have evidently already managed to appeal to these players while still being the games Nagoshi and his team wanted to make, contrary to the man's fears. Nagoshi's statements were met with some resistance by series fans, with games writer Greszes arguing that Nagoshi's instinct may seem somewhat understandable at first, but that it was off the mark.

> "The Yakuza games have likely found a diverse and growing audience because of the way the franchise examines masculinity, especially toxic masculinity. But a commentary on masculinity — toxic or otherwise — must also necessarily be a commentary on femininity, and, indeed, the full breadth of the gender spectrum at large, in order to be complete." (Greszes, 2020)

The opinions and personal biases of those in power, like Nagoshi, influence development and can put user researchers in a strange position - especially if they are new researchers that need to win the trust of a development team, which is aa common challenge in GRUX work. Hodent, for example, writes that a common negative misconception among game developers is that UX will distort their design intent. While she rejects this idea, arguing that the goal of UX is to help developers accomplish their vision and not distort their intent (2017), the fact that the idea is widespread among developers can create problems. Researchers may have to consider where their responsibilities lie towards players and development stakeholders respectively, and how much they can and should challenge developer assumptions. To keep with the *Yakuza* example, should recruitment stick to only the stated target audience of Japanese men, or are there interesting insights to be gained from playtesting with overseas women? Might playtesting with these women reveal that they aren't the "threat" to the game's core fundamentals that the developer thinks they are? Speaking purely from a profit standpoint, wouldn't testing that represents many different players also lead to a bigger potential market?

Having specific target audiences is not inherently bad, but it's important to question how we define these target audiences. For this, let's quickly turn to the game-adjacent tech industry, as well as the larger design community. In an article about the tech boom's widening of the wealth gap in the city of San Francisco, Penny writes that "There is nothing wrong with making things that people want. The problem is that personhood and desire are constrained by capital; money affects whose wants appear to matter" (2014) Costanza-Chock adds to this sentiment in *Design Justice: Towards an Intersectional Feminist Framework for Design Theory and Practice* (2018), arguing that unless

the gender identity, sexual orientation, race/ethnicity, age, nationality, language, immigration status, and other aspects of end user identity are specified in advance, the imagined user for IT and technology products often defaults to the dominant social group. "In the U.S., this means straight white middle class cisgender men, with educational privilege and high technological literacy, citizenship, native English speakers, and so on." (2018) This, they argue, leads to the problems being addressed being limited to those faced by tiny subsets of humanity.

Rankin and Irish (2020) write about this issue in relation to games specifically, stating that failures to include underrepresented populations in development processes contribute to:

> "[...] games that are less appealing to diverse player populations. [...] lack of diversity has created the negative perception of a male-dominated, homophobic, toxic gaming subculture criticized for its misogyny of marginalized populations, including women, people of color, and the LGBTQ community." (2020, s. 3)

This lack of appeal is a challenge for both user research and the long-term health of the gaming industry. Not including diverse player groups in user research may create a catch-22 situation: if a game has not been designed to appeal to a diverse group of players, many players likely won't be interested in participating in its playtesting. This, subsequently, leads to a lack of feedback that would allow developers to make the game more appealing to these diverse player groups. The lack of new ideas or perspectives can ultimately lead to creative and commercial stagnation, as the same types of games keep being made for the same types of audiences.

3.3.2 Potential solutions

Game companies will have to seriously think about how they define their audiences, what they do to reach out to them and how to enable their participation in their game creation process. Old, entrenched myths of who plays games will have to be challenged at a high level. In the conclusion of Rankin and Irish's article, they "invite those interested in designing games that appeal to a broad player demographic to seek

out Black women as a valuable segment of the player population, developing an appreciation for our unique perspective." (2020, s. 22)

What could be done to increase the "range" of playtest recruitment, if companies would want to engage underrepresented demographics? Once again, we can turn to medical research for answers. Sandler et al. (2017) used a multifaceted strategy to recruit a diverse group of potential participants for their study on breast cancer. Their approaches included word-of-mouth and distributing flyers in support groups, but also outreach through relevant organizations such as hospitals and unions, as well as "direct mail, mass emails, and media outlets (television, web, radio, newspapers, and magazines)". The direct mail and email campaign allowed the research group to target minorities, seniors, and women in specific jobs. Material was available in different languages, and messaging could be tailored for different demographics. Participants told Foster et al. (2015) that flyers, brochures, and advertisements in local newspapers could be effective, especially the newspapers that are distributed to "everyone, you know, free of charge". (Arcia 2014), meanwhile, found success using targeted Facebook advertisement to recruit pregnant women for an online survey. These strategies could likely be applied to games user research without much adaptation. Gul and Ali (2010) argue that active recruitment methods yield more results than passive methods. However, they also note that active methods will have high refusal rates and high costs.

3.4 The able-normative tester

Player groups are diverse not only in gender or nationality, but also in their range of physical, cognitive, and emotional ability. The World Health Organization (WHO) estimates that around 15% of the world's population, over a billion people, live with some form of disability. Disability "varies according to a complex mix of factors, including age, sex, stage of life, exposure to environmental risks, socioeconomic status, culture and available resources – all of which vary markedly across locations." (2011) The ESA reports that there are approximately 46 million video game players with disabilities in just the United States (2020 Essential Facts About the Video Game Industry, 2020). In "Involving players with special needs in user research" (2018), Gerling, Linehan and Mandryk write that "Player involvement in the development process through Games User Research is a crucial step in

adapting games to the needs of players." Therefore, it's important that both playtesting spaces and processes are designed to accommodate a range of different needs.

3.4.1 Limitations

There is a lack of data about if, and how, people with disabilities are included in current games user research. The playtest websites for Microsoft, Ubisoft, Electronic Arts and Activision currently lack information about whether they accommodate participants with disabilities or special needs. This poses a problem, as accessibility impacts all aspects of a playtest - from the physical layout of the playtesting spaces to the design of tests themselves. The seven hours of play and 884 survey questions discussed in section 2.2, for example, could be challenging for participants who are easily fatigued, have dyslexia, or concentration issues. Not including information about what accommodations are available for disabled players – or worse, not actually having accommodations at all – may completely exclude disabled players from participating in playtests.

Not including participants with disabilities and special needs in the game development process is not only exclusionary, but it can also have potentially catastrophic consequences. In late 2020, the game *Cyberpunk 2077* (CD Projekt Red, 2020) launched with a feature that resembled an actual, real-life device used by neurologists to trigger epileptic seizures. As a result, Liana Ruppert "suffered one major seizure and felt several moments where I was close to another one" (2020). In an interview with The Washington Post, Ruppert states that "It took me a long time to recover speech and autonomy [...] I couldn't walk for the rest of the night" (Favis, 2020). Ruppert highlighted several other aspects of the game that could be potential epilepsy triggers in her article. After discussions with the game's developer, CD Projekt Red released a patch that modified the specific sequence that had triggered Ruppert's seizure (New Cyberpunk 2077 Update Addresses Major Epilepsy Issue, 2020). One must wonder how a feature like this made it all the way through development. It's unpleasant to think about what might have happened if Ruppert had not exposed this issue, or if their reaction to the trigger had been more extreme.

The inclusion – or lack thereof – of participants with disabilities has been the focus of several studies within medical research. Rios et al. (2016) set the scene with a harsh reality check:

> "People with disabilities are largely absent from mainstream health research. Exclusion of people with disabilities may be explicit, attributable to poorly justified exclusion criteria, or implicit, attributable to inaccessible study documents, interventions, or research measures. Meanwhile, people with disabilities experience poorer health, greater incidence of chronic conditions, and higher health care expenditure than people without disabilities."

Multiple authors have studied the ethics and praxis of conducting studies with people disabilities. Iacono and Carling-Jenkins (2012) write that ethical guidelines have often failed to protect the human rights of people with disabilities and other vulnerable groups participating in medical research, stressing the need for understanding and respect. Feldman et al. (2013) found that out of 300 randomly chosen studies, only 6 clearly included persons with intellectual disabilities. They state that "over 90% of studies were designed in ways that would automatically exclude persons with ID [intellectual disabilities] from participating."

Medical research about, or including, disability has in many cases been quantitative, focusing primarily on results charts and statistics – the "what", rather than the "why." Holeman argues that this "has trained [medical] students inadequately, established flawed standards of practice and research, and delayed the development of essential medical knowledge." (1993) Hartley and Muhit build on this to make the argument for more qualitative medical research:

> "There is a real need for researchers to take a more holistic view in order to make research more ethical by having a closer relationship with the people and their needs. This requires more emphasis on action research with participation of disabled people at all stages of the research." (2003, 111)

Holeman's argument is just as relevant for GRUX workers as it is for medical students. Games user researchers should care just as much about the "whys", the qualitative experiences of people with disabilities as they do about the "whats" – why is one mechanic more accessible than another, for example, and how do they feel about playing the game?

3.4.2 Potential solutions

To combat the absence of participants with disabilities from medical research, Rios et al. provide a conceptual basis for accessible research design based on universal design and accommodations. Universal design includes making websites readable via screen reader and providing height-adjustable tables to accommodate wheelchairs. Accommodations include providing or allowing sign language interpreters, understanding that participants may get fatigued and scheduling to account for this, and being aware that accommodating them may require more time. They recommend screening for accessibility needs during recruitment, as well as providing research personnel with training. These are only a few of Rio et al.:s (2016) suggestions spanning a variety of different needs. They should be applicable to playtesting without much – or any - modification. Accommodations, even small ones, can have noticeable positive effects. Feldman et. al. write that out of their 300 studies, "Most persons with ID could have participated in at least 70% of the studies with simple accommodations and/or minor procedural modifications" (2013).

Universal design and accessibility of testing spaces is discussed in some games user research literature. In their criteria for playtesting space locations, Long (2018) included ease of public transport access, being wheelchair-accessible, and being step-free from the street. Long also writes that walkways in a playtesting space should have enough rooms for wheelchairs to enter, turn and exit. Gerling, Linehan and Mandryk (2018) provide a set of recommendations for including participants with disabilities, impairments and/or special needs that focus on four core aspects: "(1) the needs of participants, (2) methodological and procedural requirements, (3) the special nature of game development, and (4) the impact that the research setting can have on GUR with special populations." (478) Boone and Waismayer (2020) discussed how they helped grow an accessibility research program

at Xbox, covering aspects ranging from asking about disabilities and accessibility feature usage during recruitment to the advantages of remote research for integrating the accessibility community into their research process. They provide a plethora of practical tips for other game user researchers.

4. Discussion

While some barriers to inclusive playtest recruitment and participation can be tackled with simpler, practical solutions, others will require significant changes in GRUX praxis on a high level. In the realm of medicine, Barned, Lajoie and Racine (2019) write that while personal and collective responsibility is important for doing intersectional work within medical research, any efforts to create meaningful change by individuals may be stifled by institutional policies and practices if said change does not align with the institution's priorities. They argue that meaningful change would require collaboration from a diverse set of stakeholders and a commitment to recognizing entrenched power dynamics. Translated to games user research, researchers and their teams may need high-level support from their studios and companies to effectively tackle the many challenges discussed in this text. Some companies are making progress in involving diverse player groups, with accessibility for disabled players being perhaps the most spotlighted aspect right now. 343 Industries' parent company Microsoft, for example, recently announced a new accessibility testing program, where developers can send in their games and have them analyzed and validated against the company's Xbox Accessibility Guidelines (Zahand, 2021). Gamers with disabilities will be included in each test, both running test cases and providing their own feedback and insights.

One idea that the games industry would do well to take inspiration from medical research is ethics committees. Ethics committees help deal with ethical challenges that arise during clinical practice by providing ethical consultation, helping formulate policies and guidelines, and training health personnel (Hajibabaee, Joolaee, Cheraghi, Salari, & Rodney, 2016). Creating similar groups for the game industry could help ensure that test participants as well as workers are treated fairly and ethically, and it could also help the GRUX community establish unified guidelines and standards for doing this type of work. Perhaps pre-

existing organizations with some influence, such as the Independent Game Developers Association (IGDA) - which has special interest groups dedicated to accessibility and inclusivity - could be of use here.

With ethics committees comes the need for transparency. Currently, due to the competitive nature of the industry, there can be a lack of transparency, which creates a lot of challenges for the GRUX community progressing forward. Not only does it limit the amount of shared knowledge, but it also makes it difficult to discuss and critique how studios conduct their playtesting. Non-disclosure agreements can obscure the treatment of both employees and playtesters. It seems the Halo 4 playtest participant interviewed in Matt Leone's article had to be given permission from Microsoft to even talk to Leone, based on the way the article is written. This may have been due to fear of the participant revealing details about the game, but it also gives the company a lot of power to control their messaging. If a playtest participant has a bad experience, to what extent are they able to discuss that under the terms of a standard NDA? I should make it clear that this is not specific to just 343 Industries or Microsoft, but it's an interesting example (and, to these companies' credit, one of the only ones available). Transparency goes hand in hand with accountability, and the call for greater transparency is in large part about setting a standard for methodology and holding the game industry to it.

It seems unlikely that companies would stand to lose much by being more open about their processes, at least amongst other companies. If anything, there should be a lot to gain from sharing best practices and resources to a greater degree than what's currently being done. Sharing development practices, story details, intellectual property or design frameworks is one thing – but sharing research practices, participant sampling processes, and inclusive research frameworks is another. Nass, Levit and Gostin write that "Science today is [...] changing rapidly and becoming more complex, so no single researcher or single site can bring all the expertise to develop and validate medical innovations or to ensure their safety. Thus, efficient sharing of information between institutions has become even more important than in previous eras" (2009, s. 116). It's likely that user researchers in a variety of studios have their own solutions to problems discussed in this chapter, but

there's no guarantee that they are being heard – or even at the liberty of sharing their insights.

I've just spent a lot of pages being highly critical of playtest practices, but that's only because I believe that involving more players can be an incredible force for good when done right. In an interview with CNN (Elassar, 2020), accessibility advocate and blind gamer Steve Saylor recalls his emotional experience starting up the game *The Last of Us Part II* (Naughty Dog, 2020), and seeing its abundance of accessibility options:

> "I couldn't stop crying for a solid 10 minutes. It was like everything I had been working for in the past five years, my efforts with disability consulting and advocating for more accessibility in games, finally paid off."

In the same interview, Saylor goes on to describe *The Last of Us Part II* as "the most accessible game ever." Emilia Schatz, one of game's lead gameplay designers, said she had wanted to expand accessibility options after receiving a letter from a player who hadn't been able to complete one of the studio's previous titles because they had to repeatedly press a button during a fight.

User research is *really* difficult and can be especially daunting for small studios who perpetually work on tight budgets and deadlines. Sitting down and reading up on ethical study praxis and inclusive sampling processes is not high on most developers' to-do lists. I have personally made many of the mistakes written about in this text. I don't think that most (if any) game user researchers make an active, deliberate choice to be exclusionary. I do believe, however, that there is a current lack of knowledge of some fundamental issues in GRUX practices that is causing us to overlook large sections of players without even realizing it. This makes us miss a lot of potentially valuable insights. While some of the problems in this text are, unfortunately, far beyond what any one user research team can solve, being at least mindful of the limitations and issues with the work we do is essential. Games user researchers must confront biases and assumptions, both our own and those created by systemic forces, if we want our work to include and reflect our diverse audiences. Thankfully, games user researchers are

not alone. Other fields continuously struggle with the same issues, as this text has shown, and there's a lot to learn from looking at how they have dealt with their problems. The, comparatively, extremely well-established field of medical research is continuously scrutinizing and improving their research practices. Several decades of groundwork has thus already been done, and the GRUX community can and should take inspiration from those who came before.

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Chapter 7

Dynamic Difficulty Adjustment: A Practical Case Study

Nahid Moosavi

Abstract

Dynamic Difficulty Adjustment is a mechanism to balance games' difficulty level based on an individual's skills level. Balancing a game difficulty level for a player is a solution to increase player engagement and make a game session more fun. Even games' difficulty level increases by player progress in games, some players might find some mechanics more difficult than the others. This chapter focuses on DDA development, explaining different stages of a DDA system project based on the author's experience in a project.

Keywords: Dynamic Difficulty Adjustment(DDA), Dynamic Difficulty Balancing, Artificial Intelligence, Flow Channel

1. Introduction

Imagine the first time you launch a game you have just purchased and installed, when a window appears on your screen: "Select the difficulty level ...". In many cases, you find a set of options based on the developers' assumption, "Easy, Medium, Hard, Very Hard, ...". For me, it is when a sequence of questions spring to my mind: Which level is the most interesting one? Which level matches my playing skills? What if my skills

level is between beginner and intermediate? What if I am professional in some skills and beginner in others?...

After selecting the difficulty level (for example Easy) and starting the first level, you realise that some mechanics are too easy for you and some mechanics are beyond your skill's level. As you play and advance your skills in the game, the gap between your advanced skills' and poor skills' level increases. Therefore, after passing 5 or 6 levels you are in a situation that some of your skills are comparable with Medium difficulty level and some still comparable with Easy difficulty level. If this gap increases continuously, in a point you might not be able to pass a challenge in the game. The challenge's level is higher than some of your skills level, but you can not go to the next level without passing this challenge. Unfortunately, after several attempts, you may become disappointed. Vice versa, when the challenge's level is lower than your skills level, you may become bored, (See Figure 1 - Left).

For a player new to a genre or a game the situation would be worse. He/she might not have clear idea of the genre/game, its difficulty or mechanics. In many cases, even Very Easy level would be hard to play and player satisfaction with the game drops sooner or later, (See Figure 1 - Right). It means that they encounter poor Game User Experience, losing a considerable number of new players would be one of the consequences. The main problem arises because, the game difficulty levels are fixed and game can not analyse the player skill level and adopt its difficulty with player's skills. Also, players have to choose the difficulty level manually while they do not have any idea about the difficulty levels of the game.

Dynamic Difficulty Adjustment (DDA) is a solution to overcome traditional static difficulty adjustment issues. DDA is not limited to player health, pickups or weapons' power, it can be used to dynamically change enemies' behaviour, storytelling and all the game component that are involved to the game challenges. In the highly competitive video game industry, Game User Experience (GUX) is a determining factor in the failure or success of a video game, a well-Developed DDA would improve GUX. The base theory behind DDA is: *Players can simply become bored by a very easy game difficulty level or become anxious when a game is too hard in comparison whit their skills* (Silva et. al. 2017; Cano et. al. 2020; Liu et. al. 2009; Stein et. al. 2018; Justesen

et. al. 2019).

This chapter will present the fundamental theories and concepts, and state-of-the-art implementations, of DDA in games. It will also present a real-world example of DDA implementation, showing how DDA mechanisms can work, even in small and relatively simple games.

2. DDA System Analysis and Design

In the field of Game Research and User Experience (GRUX), the *real-time* mechanism to adjusting the difficulty level based on the player's *skills, learning curve and improvement*, is called Dynamic Difficulty Adjustment (DDA). DDA is a relatively novel approach to keep players in the *Flow Channel*. The Purpose of DDA is to essentially make Players engaged and entertained, during a play session. Designers mainly familiar with raising challenges and difficulty and keep players engaged. However, DDA does not rely on pre-design and fixed challenge levels which are shared to all players. It is a mechanism that adapt game difficulty for each individual and they can have personalised game experience.

Flow Channel is the area between anxiety and boredom, where challenges of the game are at the level of a player's skill, (See Figure 1). The key point is that, flow channel is not a one layer fixed spectrum. For each skill, mechanic or anything that can keep player engaged to a game, we can define a layer for flow channel. For instance, we have a player who is playing in a game with different skills. Our player has good level of skills in swordsmanship but he/she is bad at sneaky movement. Many games use skills upgrade system to monitor a player's skills level and address separation of various skills improvement. They give skills points to players based on their improvement. When they use a fixed method which does not support real-time difficulty adjustment many issues will arise. For instance, a fixed upgrades system does not cover problems such as fluky skills upgrades when a player achieve a skill upgrade by chance. Also, does not address the first time difficulty level selection, for example when a player chose medium level, the game sets all skills to a medium level. Another important point is the forget curve, which is the opposite point of learning curve. A player who played a game for a while and because of any matter could not

play it for a long time, forgets many things and his/her skill level drops.

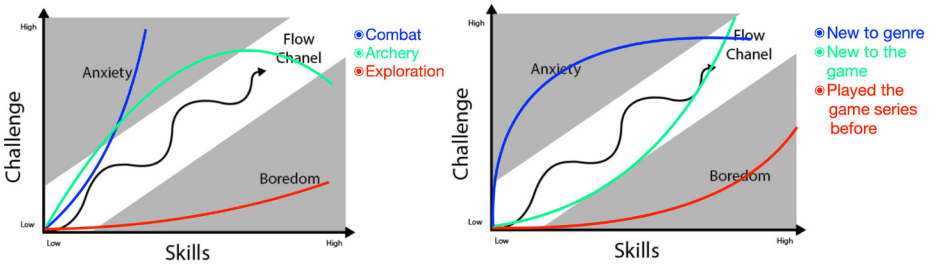

Figure 1: (Left) Classic Flow channel and different challenge levels a player may experience based on his skill level and game mechanics (Sepulveda et. al. 2019); Figure 1: (Right) Classic Flow channel and in game experience for players with different characteristics (Sepulveda et. al. 2019).

While in the game saves, all skills and level ups are saved based on the previous skills level. Hence, in the current situation the player's skill levels in the game saves do not match the current ones.

The principle of DDA is, as previously mentioned, to ensure that a game's difficulty level becomes, dynamically and seamlessly, adapted to an individual player's specific level of skills. In (Ebrahimi & Akbarzadeh 2014; Silva et. al. 2017; Cano et. al. 2020; Liu et. al. 2009; Stein et. al. 2018; Justesen et. al. 2019; Carofiglio et. al. 2019; Bontchev 2016; Papadimitriou et. al. 2019; Sepulveda et. al. 2019), difficulty adjustment consists of doing modifications to parameters, scenarios and game behaviours to prevent the players feel frustration/boredom when facing the game challenges.

A well-Developed DDA mechanism differentiates itself from other forms of difficulty adjustment by not requiring players to choose a game difficulty level themselves based on their self-evaluated skill level, but to also stay invisible to the players while they are playing. Let me give an example of my favourite game, *Assassin's Creed Valhalla*. To set settings, a player has to select a difficulty level for 3 different categories of difficulty settings. The game provides explanations for each option to make it clear for players. Also, players can change the difficulty level at any preferred moment during the game session. However, for first-time players, evaluating their skills level is not simple. I have played every game in the *Assassin's Creed* series, but choosing the proper options can still be difficult. I am good at fighting with swords, but my eyesight

does not make me as good at the games' long-range combat mechanics. So, which is the more proper combat level for me?

Three categories of difficulty in the game settings and total 36 possible options, when the player just started the game, can confuse he/she, (See Figure 2). When I searched the phrase "assassin's creed Valhalla difficulty settings", found plenty of web pages, tried to answer this question: "*Assassin's Creed Valhalla* – Which Difficulty Level Should You Choose?" or similar questions. This brings in mind, that selecting a correct difficulty level among these 36 options is a concern for players.

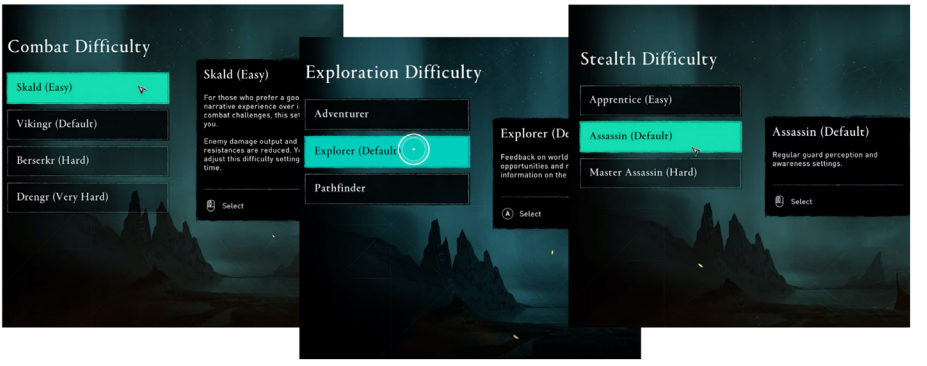

Figure 2: *The Assassin's Creed Valhalla* difficulty selection screens, with its three categories: Combat, Exploration, and Stealth.

The context of modern DDA inclusion is not limited to changes in statistics of the enemy (e.g., Hitpoints, Damage) or ammunition and pickups. By using AI and ML techniques, it can control enemies' behaviour, access to abilities, storytelling, and more. It worth mentioning, DDA is an approach to solve static DA problems. DDA systems have been around since 1981. *Astrosmash* was a game that became harder as the game progressed, but when the player was running out of lives, it got easier again for a short period of time.

Various studies with different methods conducted in the DDA mechanism context. The researchers tried to provide a DDA mechanism, examine its effect on players, use it in the different game genre, to name but a few. Majority of these studies focused on 3 main requirement for a DDA system. First requirement is to automatically identify a player's skills level and adapt the game to that level as fast as possible. Second

one is tracking the player's improvement and regressions as they progress through the game and system should keep the balance according to the player's learning curve. The third DDA system requirement concerns with keeping the game states coherent to previous ones. The emphasises is on the fact that, the adaptive process must not be perceived by players. It means, the game difficulties do not change too dramatically, as that might reveal the system and break the player's immersion.

Although these studies exist, very few (if any) present clear guidelines of how developers can implement a DDA mechanism into their game. The specific DDA mechanism presented here is, of course, not universally applicable. But, it does present the general framework of a basic DDA system. To Develop a DDA system, majority of the methods in the considered articles have the same routine, and four fundamental phases used to develop a DDA system for a game.

2.1 Analysis

The first phase to develop a DDA system is analysing players' skill level/ performance and finding related factors in the game. The first step to measure the difficulty level is determining which factors are involved in the players' skill level/ performance and has impact on them. Hence, a DDA mechanism should adjust the difficulty level based on this decisive factor. Furthermore, quantifying the difficulty level that each player experience in real-time is of great importance.

The first important step to analysing players' skills is finding variables concerning players' skills and game mechanics. These variables are different based on game design, game genre, game mechanics, storytelling, gameplay, etc. Hence, developers can find different variables for games in different genre. For instance, in a first-person shooter game, the number of kills, the amount of health and number of damages a player takes from enemies are variables to assess a player's skills. While, in a 2D Platformer game, the variable would be the time a player spends to go from point A to point B, without colliding with obstacles (Ebrahimi & Akbarzadeh 2014; Silva et. al. 2017; Sepulveda et. al. 2019).

Although more variables lead to a more accurate DDA, developers

should think about side effects. Higher resource consumption (e.g, memory, CPU, ...) and slower decision-making process in a game, and as a result, game performance reduction are unavoidable problems when numerous variables are defined. Since developers have to avoid negative impacts on GUX, making a trade-off between the number of variables and DDA accuracy is a necessity. Factors such as game complexity, minimum hardware requirement, game running platforms, ..., are determining. Finding variables and making a proper balance between DDA accuracy and limitations is a challenging task. It needs wide knowledge and experience in both game design and game programming concept.

2.2 Main Design Points to keep in mind

As with almost all the mechanism in the computer science world, developing a DDA system involves various challenges. The development team have to decide on how to make a practical trade-off between these challenges. A game can work without a DDA mechanism, but an incompetent DDA will end up in a failure of a game in the market.

While many players welcome the DDA mechanism, many would not. The design has to provide a solution for players who do not like support from the game. Some players may rather playing the game, failing more than 1000 times than getting help from the system. A simple click to turn DDA on/off would be the simplest solution. This solution seems against the one of the main rules: "*DDA must not be perceived* by the player". However, the rule which seems to be more practical, is: To keep the game states coherent to previous ones, the *adaptive process must not be perceived* by players. It means DDA behaviours and the changes it makes in the game world should not be perceived by player during a play session.

When the player realise how a DDA system works, chances are to cheat the game. For example, a player can repeatedly lose before a hard boss-fight or a hard area. Then, in the time that the actual battle starts, DDA sets the level of challenge according to the latest player's performance and changes the battle to a simple one. Therefore, DDA has to adapt to players needs with an imperceptible and gradual approach. A tracking mechanism to compare players learning curve is a proposed solution to this issue.

While it is possible to perform DDA on all elements of a game, such as riddles, puzzles, some quests, it is not a wise decision. It brings extra expenses and complexity to graphics, world design and development. The safe margin is to limit the use of DDA in this context. However, it does not mean if you have an impressive idea to develop DDA for your game, forget it. Just do not overdo it in this context and keep a balance between design and programming.

To keep players in Flow Chanel, the pace of the game difficulty should not be steady, floating instead (Constant & Levieux 2019; Sepulveda et. al. 2019). Accordingly, sometimes the difficulty level needs to be a bit more than a player skills level, and sometimes a bit less. Evaluating the level of challenge that the player experience is important in this regard, or keep a record of their experience and then change the next adaptation based on the previous ones. A basic DDA can use a graph data structure, to save and keep track of the player previous skills level during play session. In a bit more advanced system the graph can keep the prediction data of the next skills level.

To have a well-designed DDA system, the modularity of DDA and separation in concerns are two key recommendation. While separate elements can be adapted based on DDA design, developers should separate each module. For example, when a DDA mechanism decides to adjust a set of player's element in a proper moment, modularity leads to change the variables in various possible orders. Please imagine, a DDA that needs three actions to adjust difficulty (e.g., Increase the player's life, reduce the enemy sensitivity range, Reduce the damage amount which a player takes), with proper actions, the DDA can prioritise actions order; or delay some actions until the proper moment comes.

2.3. DDA Scheme

In the simplest case, a DDA mechanism would be a finite state machine consisting of 3 states. In the first state *Monitoring*, when the player performance changes, the state goes to the second state. At the second state *Skill Evaluation*, DDA evaluates the player's skills level or emotional state (applies to Lab tests when researchers use EEG signals). Transition to the third state happens, according to the DDA design and the predefined triggers. The third stage is the point that the

magic happens. Based on the evaluation results from the second state, the adapting process of game difficulty occurs. After balancing the difficulty level, DDA registers the changes and the state circles to the first state. Obviously, developers can add more states and transitions to this basic finite state machine. It is time to see what are these stages, and how DDA transit between them. Figure 3 depict the process.

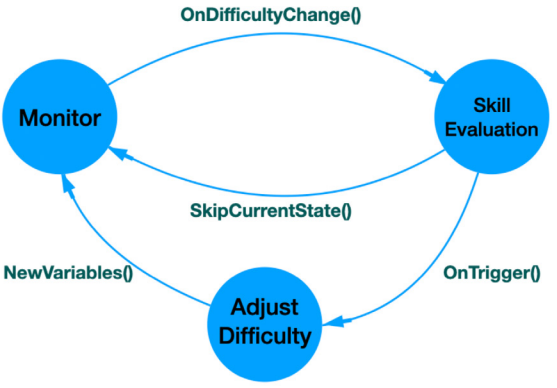

Figure 3, Finite State Machine for DDA.

2.3.1 Monitor a player

Literature presents two different approaches to collect data from players. Explicitly, by collecting data from players directly (Cano et. al. 2020; Liu et. al. 2009; Carofiglio et. al. 2019; Bontchev 2016) and Implicitly, by collecting player data from the game internally (Ebrahimi & Akbarzadeh 2014; Silva et. al. 2017; Stein et. al. 2018; Pinto et. al. 2018; Hunicke & Chapman 2004).

In the Implicit approach, also called the heuristic method, roughly all the variables considered to detect players' skill are used to define the difficulty level he/she experiences and call the DDA mechanism.

Most studies that established explicit approaches used brains signals, such as EEG-Based methods(Cano et. al. 2020; Liu et. al. 2009; Carofiglio et. al. 2019; Bontchev 2016). They use an event trigger mechanism to trigger a change in players' state. For example, if the anxiety level of a player goes beyond a threshold, the triggered event recalls a DA module to adjust the difficulty level based on the player's emotional

state.

Studies that worked at Implicit approaches used various methods to trigger changes in the level of difficulty a player experience. Some of the implicit approaches used event trigger pattern. Another method would be the sequential tracking of players' state, which calls a DDA system in repeated periods. These periods can be constant or variable. A too short period leads to an overhead increase, while a too long period, chances are that difficulty adjustment does not perform timely (Sepulveda et. al. 2019).

2.3.2 Skills Evaluation

In most explicit approaches the skills evaluation state is not necessary. In this category, the DA module is called directly according to the player's current emotional state. In contrast, implicit methods need this state to avoid many problems, such as changing the variables gradually to make the game experience cohesive. In order to avoid the risk of backing to a very previous state of player skills level, checking the learning curve and history can perform in this state. Furthermore, this state is the place the DDA mechanism can decide on how to change the difficulty level to keep playing in the flow channel while the pace of the challenge is not constant.

Different AI and ML-based methods are applicable to determine whether the changes in difficulty level a player experience should lead to triggering DA or not. Next, if there is a change in players' skill/performance level, the difficulty level is adjusted with this new level. Furthermore, the DDA can keep track of the learning curve of a player. Also, a prediction can apply here in this state to predict the next level of difficulty based on a player's learning curve. Based on the output of this state, the DDA mechanism decides whether to back to the previous step without any changes in the difficulty level or trigger DA to adjust the difficulty level based on the new situation.

2.3.3 Difficulty Adjustment

In the final step, the collected game data/variables, are analysed and compared with a reference, and then adjustment occurs based on the

results. This adjustment would be the manipulation of in-game parameters, scenarios and behaviours.

In this state, which makes a loop with the Monitoring state, defined variables override by the DDA system and new current skill/performance level considered for the player.

3. DDA Development

In my opinion, highlighting the implementation steps of a simple DDA mechanism would be the best way of talking about it. For this purpose, a simple, custom made, FPS game will be used as an example and testbed to introduce you to DDA implementation. The reason for choosing an FPS game is that it is a common genre and has easy to understand concept and mechanics. It will hopefully provide a clear, and easy-to-follow, example of how to work with DDA.

The game is a simple FPS game, with enemies and dark terrain. Enemies are zombie characters, free assets from the Unity asset store. The player has 3 guns with different level of damage and a flashlight to help them navigate the dark environment. The core mechanic is to shoot and kill the enemies, search the area to find resources (bullets, batteries and life), to finally find the exit door and exit the level. To reduce the darkness of the environment, there are some environmental light sources provided as lamps and illuminating flora.

3.1 Detecting the Game Variables

In this game, the DDA decides on the difficulty level, and manipulates variables of three separate modules: *Player, Environment and Enemies*. The first step is, to find the right variables as mentioned in 2.1.
After finding these variables, the second step is implementing at least three different levels of difficulty for the game (traditional difficulty levels). To achieve this, the first version of the proposed DDA had manual Difficulty adjustment with Easy, Medium, Hard and Very Hard levels. I suggest, having a traditional difficulty adjustment would be beneficial to tweak variables and find the best values that match your game. Plus, you can check your DDA data flow and dependencies before sinking under complex layers of a DDA. So, the first step could be implement-

ing a traditional difficulty adjustment. If you consider it as the base, you can build your DDA on top of it.

4 different Difficulty Levels plus 2 level that show when a player is out of the flow channel and system needs some action to change the level of difficulty.

```
{
    Nothing,//This is for the time that player can't experience any challenge
                //system needs a forward action to make the game enjoyable
    Easy,
    Medium,
    Hard,
    VeryHard,
    impossible // This is for the time that player can't pass the level and the
                //system needs a recursive action to make the game playable
}
```

3.1.1 Player's Variables

Based on the game genre, game mechanics and character design, a DDA system manipulates a wide variety of variables of a game avatar (Pinto, et. al. 2018; Francillette et. al. 2017; Bontchev & Vassileva 2017: Lopes et. al. 2017). The decision on *how much* and *when* to change these variables, happens in the skill evaluation state. While monitor player state is the place that detects the change in the difficulty level. In some cases, this evaluation based on using the same variables and in some cases, DDA should use different variables of a system such as an avatar's movement tracking system.

Considering a humanoid game character, one category of variables is the character's speed in the walk, run, swim, attacks and double actions. This category can be changed when DDA detect that the player takes damages because he/she can not move around the game world. For example, when his/her jump skill did not develop during game sessions, then falls repeatedly from a height. Also, when the character is driving, vehicle movement variables are the category of variables that DDA can adjust.

The amount of player's health and the pace of health decrease could be another category of variables. A DDA system can change these variables when a player gets damage. In this case, the easiest way is to use

the same health variable for detecting change and/or triggering the DA module.

The power of a player's weapons and all variables related to the weapon could be another category. A DDA system can change these variable's values, as simple as when a player takes damage or in a complex way, such as keeping track of a player's shooting skill (e.g., successful shots or headshots).

Obviously, the more complex design, mechanics, character a game has, the more variables to manipulate by the DDA. However, the overhead of computation and resource consumption always are limitations. As a result, a table of priorities is my suggestion to classify variables and prevent complications.

In the case study, the player implementation part of DDA, consist of a set of variables to manipulate: *playerHealth, weaponDamage, weaponRange, weaponDelayTime, weaponZoom, flashLightIntensityDecreaseFactor.*

3.1.2 Environment Variables

In order to Identify the world's/Environment's or level's variables, game level designers are the best source of information. The process of finding and changing variables to change the environment without attracting players' notice is not a simple task. Imagine that manipulating one part of the world is possible. But, when is the proper moment to perform these changes? Since manipulating the world imposes a heavy overhead on the game engine (e.g, dynamic lighting) and has a high design expense, developers have to consider all aspects. In most cases, considering development limitation and expenses, keeping this part very simple is the best decision. Unless the game design is based on these changes and it is a main part of the game mechanics.

In this case study, the player's *pickups, bullets, batteries*, and lives are the only parts of the world that the DDA changes to balance the difficulty for the player. I tried to change light resources to make the game darker in order to make it harder for players to see the world, but its effect on lighting performance and GPU/CPU and my old laptop

stopped me from trying it more. While it works, imposes a heavy computational overhead, my laptop was overhitting. Two types of changes are applicable in this context. The first is a change in the amount of resource each pickup object provides. For instance, the lower amount of ammo leads to harder challenge. The second approach is the number of accessible resource objects in the game. To do this, the lowest number of resource objects that a player can use to finish a game is available from the start of the game. DDA can distribute extra objects in addition to the first installation, based on a player's skill level. To keep the player unaware of these changes, it should happen outside the player's field of view.

3.1.3 Enemy Variables

To develop a DDA system, if there is an AI-based enemy in the game, changes in enemies behaviour will make the game more challenging for players. The changes can be as complex as performing different AI algorithm for a different level of difficulty or changing variables in the AI system of enemies, or a mix of two mentioned approaches. Also, it could be as simple as a change in enemy health amount. It relies on the game design, the computational resources limitation, enemy character, ...

In the case study, the enemy has different variables that DDA can manipulate. The set of variables are {*enemyHealth, enemyAttackPower, enemySensitivityRange, enemyTurnSpeed, enemySpeed, enemyColliderDimension,* ...}. Change in these value changes the enemy's performance and behaviour.

Table 1, used to prioritise variables. In Figure 3, the red lines around the enemy show enemySensitivityRange, the green lines are enemyColliders, to make it harder to shoot the enemy the enemyColliders reduce is reduced and vice versa. Also, ammo and battery resource, flora light resource are visible in the middle left of the picture.

	Enemy	Player	Environment
Priority1	enemySensRange enemyAttackPower	playerHealth weaponDamage	amount of bullets, batteries, lives
Priority2	enemyHealth enemyColliderDim	weaponDelayTime	distribute extra objects
Priority3	enemySpeed	flashlight IntDecFac	
Priority4	enemy TurnSpeed	weaponZoom	light resources

Table 1, variables priority table

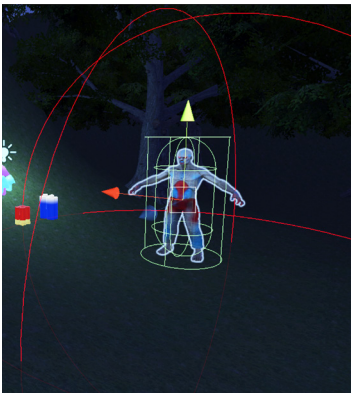

Figure 3, a view of the game

3.2 DDA Main Methods

The implemented methods in the project are explained in this section. The main goal is to keep it as general as possible. For this, pseudo-codes provided to make the project steps more clear, and not focusing on details. To access the codes, a GitHub project is available, and readers can track the codes and data flow of the project by downloading it.

3.2.1 Monitoring Player's State

The main purpose of the monitoring module is to detect any changes in the player current state. If there is a meaningful change in comparison with the previous state or states, call the SkillEvaluation Method.

A decision tree seems to be a practical technique to classify the player performance and access player skills evaluation history. While its time complexity is O(n log n), developers should reflect on memory limitation and the overhead of computational operation to search, resort and add/delete nodes to the tree. Besides, as the DDA monitoring is an iterative operation and happens in the game execution loop, a pruning mechanism is needed to reduce the number of branches and keep the only valuable history of the player.

In this project, a 3 level binary tree is enough to detect a change in the

current difficulty state for the first version of the DDA system. This tree may change by adding new levels to have a more accurate decision or replace it with any classification method in future versions. The code is reusable for another FPS game by changing the component that works better in that game context.

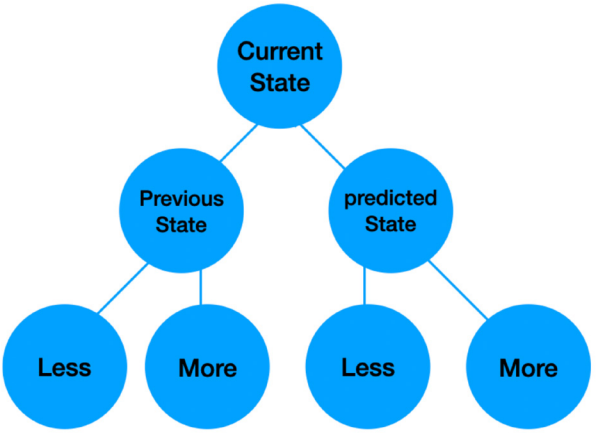

Figure 4, 3 level binary tree

Figure 4 depicts the monitoring state, which keeps the current state, previous state and the predicate state of the player's skills. When the Monitor method detected any changes, it looks at the current state value. Based on the variable, if the detected value is *more/less* than the current state, it means that it should check the right-hand side of the tree, *predicted state*. Else it should check the left-Hand side of the tree, previous state. This comparison only happens if the detected value is out of a specific range and have a meaningful difference from the current value. By this, the DDA system avoids calling the SkillEvaluation method for each insignificant changes in player skills' level.

In both cases, when the detected value is less than the node value by a meaningful difference, DDA uses the leaf with the less label, to pass the value to the Skillevaluation module, and vice versa. However, if DDA can not find a meaningful difference, it passes the node value.
In addition to a tree for player's Skills level, a tree with a scoring(ranking) system to keep track of the level of challenges is necessary. The main purpose of this tree is to find the close to the optimal reaction of the DDA in comparison to player action.

The basic structure of GameDifficultyManager:

```
{ Repeat
        MonitorDiffcultyLevel( ) //Checks if there is a meaningful changes in DL
Until (current difficulty level != new difficulty level)
Call
        ChangeDifficultyLevel( )
                If (MeasureTheChangeRange( )) //Tree travers and decide on
                                                //going to the SkillEvaluation state
                        Call
                                DifficultyLevelChanged( )
}
```

To monitor the player's behaviour in the game, many variables from the player's variable are reusable. Also, there are some approaches in academic literature (Mainieri et. al. 2018; Peng et. al. 2019; Kusano et. al. 2019; Bontchev 2016) such as finding player's movement pattern, shooting and attack pattern. However, all these methods need heavy AI computation in the background, and developers should decide on the method and the trade-off. For example, if they use a decision tree to decide on the level of challenge a player should experience based on his/her movement, the computational complexity or other disadvantages of the technique should be considered.

My advice is to first design and implement a simple code with well-structured classes in terms of reusability and scalability. After finishing the first version of your DDA system, you can change, improve, add or delete as many components as you think they improve your system performance, make it work more realistic and believable for players. I tried to avoid using complex AI techniques, in the first iteration. Instead, focus on the overall design and implementation of the DDA system. To show that DDA works even with simple techniques, given examples are simple. However, you can find various studies explaining their AI/ML techniques in this regard (Hunicke & Chapman 2004; Missura & Gärtner 2011; Urmanov et. al. 2019; Kusano et. al. 2019; Papadimitriou et. al. 2019).

3.2.2 Skill Evaluation State

In SkillEvaluationMethod, a practical technique to map between the player skill level and the level of difficulty is the first step.To nail it, dif-

ferent variables should be mapped to different difficulty levels, manually. For example, when the player takes damage and the system needs to change the power of the enemy's damage, designers should first find which value is better for this level of difficulty.

The first challenge is to avoid distinct levels with a huge gap since levels need to be as close as possible (very close leads to overhead, very far may affect the GUX). The second challenge arises when the system triggers the DA module. DDA should make the change process smooth and avoid fast changes to avoid player notice changes. For this, suspending the process until the proper moment is one of the approaches.

One possible data structure to use is a Res-Black Tree. In computer science, Red-Black tree is a binary tree with the ability to balance itself. When the tree is modified, the rearranging and repainting operations perform. While iterative rebalancing is not perfect, it guarantees the search operation in O(log n), where n is the number of nodes in the tree. The time complexity is the same for insertion, deletion, rearrangement and recolouring. In this project, I used a Red-Black tree to keep it simple and make the skill tree balanced. A utility class to implemented for tree operations. Since everyone can decide on using different data structure and using different techniques to make a decision, I move to the Skill evaluation directly.

In the proposed project, the system traverses the tree to find the more relevant history to the new difficulty level. While the project has three different trees for each element (Player, Enemy, Environment), it can handle each module separately. To reduce computational complexity, each tree has 20 levels. It means that systems need to delete very previous history or keep a record of it (it can improve the system, however, increase overhead and resource consumption). The A* Tree search method used to traverse the tree and find the proper level of difficulty for the player.

The body of SkillsEvaluation:

```
SkillsEvaluation( ) {
    PlayerSkillsLevel = SearchSkillsHistoyTree( )
      if ( playerSkill != null )//player skill level has meaningful difference from the
current                                    //difficulty level
       Call
              NewDifficultyLevel( )
       }
```

To compare the current difficulty level to the previous and predicted ones that are saved in the Red-Black tree:

```
    PlayerSkillsLevel SearchSkillsHistoyTree(DifficultyLevelPlayerExprience ) //A*
Tree search
       {
          Apply A*
         return PlayerSkillsLevel;
       }
```

3.2.3 Difficulty Adjustment State

In order to map the player's skill to the challenge's level values, the DA module in the game, utilises a dictionary's key-value pairs. Dictionaries are powerful and can find values at a fast pace, its scheme is similar to table2 and easy to implement. Finally, to save in the root of the tree, the DA module sends the new difficulty level to the monitoring state.

In my first setup, I used Table 2 to map between players health and difficulty levels. The same routine happened for enemy damage. These values found after testing the game and tweaking values when I wore my game design hat. Note, the more level of difficulty you have the more rows of table you need. During the project progress, I added more details and rows to the table2.

	Player Health	Enemy Damage
Easy	200	To the next Level = +10 To the last Level = 0
Medium	150	To the next Level = +20 To the last Level = -10
Hard	100	To the next Level = +22 To the last Level = -20

Table 2, values for 4 level of difficulty

4. Evaluating DDA and Apply Changes

While many studies that used explicit and implicit approaches [3-6] tried to contradict each other, these two approaches can act as complementary pieces of a puzzle. In my opinion, the development process of DDA development may change by a combination of these approaches. This can turn to implementing a heuristic-based DDA, evaluating it by EEG based method, solving detected problems and finally use the other GUX methods such as questionnaire to evaluate the final result (it can be an iterative loop). To find weak points of a DDA system, developers can combine both implicit and explicit methods as well. One approach would be gathering the avatar's data implicitly and players data explicitly (using EEG signals for instance), at the same time. By comparing gathered data, developers can adjust DDA, find weak points, change methods or variables. However, it increases the time and expenses in one way or another.

Similar to other elements in a game, an evaluation phase for the developed DDA system is essential. Relevant GUX methods lead to detecting DDA system limitations, shortcomings, problems and their influence on players[20]. In the condition a DDA system does not satisfy players expectations and needs, chances are the game fails in the market. Therefore, DDA should be treated as other elements of a game and test it from a GUX point of view.

Evaluation of a DDA system affects players experiences and makes it possible to refine it based on players opinion. One of the decisive factors to test is, whether players perceived the DDA changes or not. To realise the DDA outcomes on players, the game has to be tested with DDA and without it.

5. Conclusion

In this chapter, the main key points of a DDA system covered and a simple DDA system to a FPS game explained. After finishing the project, game difficulty manager system is able to adapt the game with the current skill level of the player. It is worth to mention that the project is upgrading and the code may improve in future. For example, the next goal is adding more AI flavour to the game.

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Chapter 8

Creating Games That Everyone Can Play

Linnéa Eklund

Abstract

The focus in this chapter is to divulge into the topic of accessible games, and how they can be made. To do this, this chapter will firstly present how disabilities can affect players. Secondly accessible games and how they affect the players. After that, the chapter will divulge into the making accessible games, from tools and techniques to practical examples of games that are made with accessibility in mind and games that have the option to be accessible. The chapter will then attempt a discussion on the topic of accessibility in games and in the end present some findings.

Keywords: accessibility, accessible games, players with disabilities, game development.

1. Introduction

Having a disability that hinders an individual to enjoy playing games is the reality for 20,5% percent of video game players (Garber, 2013). For these players, the act of playing games itself can range from being a bit difficult to access, to be fully inaccessible.

This chapter presents different aspects of the area of accessible games, with the hope of giving the reader more insight in what accessible means in relation to games is and how it can be achieved while

developing games. By doing this, the aim is to demystify the area of accessible games and developing accessible games. Something that is important to keep in mind while going into this area is that one person may not be able to do *everything*, but everyone can do *something*.

2. The impact disabilities have on gaming

Video games are generally seen as a means of amusement and leisure, a part of the digital entertainment industry. Despite that, many games have accessibility barriers that makes them nearly unplayable to players with disabilities (Aguado-Delgado, et al., 2020). The barriers come in different shapes, from hardware to software, which can hinder different players form playing the games. In an article by Bierre, et al, (2005) they present common problems that players with different disabilities may encounter while playing games. Some of the problems included are:

- The game has a narrative that is complex and difficult to follow, which may be a problem for a player with a cognitive disability
- The game has no subtitle, and the story is advanced in cutscenes, which may be a problem for a player with an auditory disability
- The game gives information in text only, which may be a problem for a player with a visual disability
- The game requires the player to have a precise timing with a controller, which may be a problem for a player with a motor disability

As there are many kinds of disabilities, Aguado-Delgado, et al. (2020) presents a taxonomy, used to categorize disabilities in the context of playing video games. In this taxonomy, Aguado-Delgado, et al. (2020) presents three main categories, Cognitive disability, Motor disability, and Sensory disability. They are explained in the next headings.

2.1 Cognitive disability

Cognitive disability is a term that includes a variety of intellectual and cognitive impairments, such as dyslexia, ADD, ADHD, dementia, autism, mental illness, or aphasia. An individual with a cognitive disability may find it difficult to encountering situations where skills such as problem solving, memory, attention, abstraction, language, or calculation is

needed (Borg, Lantz & Gulliksen, 2015). Within video games, this can result in the individual having difficulties to follow a complex narrative or following a complicated map that the individual needs to remember. The individual may also have difficulty keeping up with a fast-paced game that requires the player to have fast reaction time or has a lot of text that the player needs to read to understand the game (Bierre, et al, 2005).

2.2 Motor disability

The category of motor disability includes disabilities that affect an individual's mobility and motor ability. Such disabilities include illnesses like arthritis, cerebral palsy, multiple sclerosis, and Parkinson's disease, but also traumatic injuries such as spinal cord injuries, loss or damaged limbs. Depending on what kind of motor disability an individual has. They can for example have issues with moving their body/affected parts of their body, involuntary movement, have muscles that weaken over time or problems with fine motor control (WebAIM, 2021). When it comes to playing games, such issues can make it difficult to operate controllers (Fanucci, et al, 2011) or it can make the player restricted to using a single stick/button to play (Bierre, et al, 2005).

2.3 Sensory disability

Sensory disabilities include both auditory and visual disabilities. Auditory disabilities include both people who are hard of hearing and deaf. Individuals with a mild degree of hearing loss are hard of hearing. Individuals with a severe hearing loss are deaf (Ladner, 2012). In relation to playing games individuals who are hard of hearing may have a hard time to keep up within game conversations if the background sounds disturb them, for deaf players this could mean that they may not be aware of any environmental sound or any speech within the game (Bierre, et al, 2005).

With visual disabilities there is a variation in the degree or kind of impairment the individual has. In general, the classifications when it comes to visual disabilities are; sighted, low vision and blind. (Ladner, 2012). A blind player cannot play a game that use visual cues to prompt the player and would have to rely on sound cues or speech to progress

in games. A player who has low vision may be able to detect light and movement but have limits to what they can perceive. (Bierre, et al, 2005).

3. Accessible games

Accessibility in video games is defined by the International Game Developers Association-Game Accessibility Special Interest Group (IGDA-GASIG) (as cited by Aguado-Delgado, et al., 2020) as "the ability to play even under restrictive conditions, because of functional limitations of disabilities, for example sensory or motor".
Making a game more accessible can be achieved in different ways, depending on what aspect of the game that the developer aims to make accessible. If the developer wants to make their game more accessible for players with cognitive disabilities, the game could give the player hints. Such as reminding the player of what currently is going on and what should be done (Garber, 2013). An example could be having a log of what has been done and what the next objective is in the pause menu. If the player has motor disabilities, the game can support multiple types of input devices, or customized button configuration (Garber, 2013).

3.1 How accessible games affect players.

> "No real words can describe the amount of life video games can breathe into you. The only analogy that I've ever been able to come up with that comes close is to ask you if you remember the first time someone you were in love with said the magical words "I love you." That feeling of life pouring into your body, powering your soul, and creating a memory that will stay with you until you draw your last breath, and perhaps beyond". (Spohn, 2018)

How accessible games affect players with disabilities shows in different aspects. In an article by Cairns, et al, (2021), they investigated what makes a game important to players, and if the values are the same for disabled and non-disabled players. In their study they found eight main themes. Of these eight themes, seven were found in both the groups. The themes were Connecting; Diverting; Beneficial; Art; Fun; A way of

life; and Enabling (Cairns, et al, 2021).

In the Connecting theme, the players felt value in being able to connect with others through gaming, this was also a point brought up by Garber (2013) where the notion was how more time is spent in virtual worlds and that there should not be barriers excluding people to access these.

The diverting theme delves into the de-stressing and relaxing of the players while they are playing the games. This in the context of players who have different disabilities also mean diverting the player from their disability-related issues. In some cases, games can provide outlets for a player to do things they cannot do in their real life because of constraints (Cairns, et al, 2021, Garber, 2013).

In the beneficial theme players bring up that games could help them improve in areas outside of the game. This could be a way to improve skills that may help them in their everyday life, such as motor skill or memory skills. In these cases, games provided a space where the players could develop socially (linking this theme to the Connecting theme) in a more controlled way, which can lead to reducing isolation and the building of supportive communities (Cairns, et al, 2021).

The theme of Art was not mentioned as much as the other themes, however, some players from both groups had mentioned that they considered games to be works of art and that games could be a way for players to be creative and to experience the creativity of other people (Cairns, et al, 2021).

The themes of Fun and Way of life had players mentioning that some play games just for fun as a way of entertainment, or as a way of life with the implication that playing games is just something they do as an activity (Cairns, et al, 2021).

The last theme, that were mostly expressed by the players with disabilities, is Enabling. Within this the players expresses that games let them do and experience things that otherwise had been closed off from them (Cairns, et al, 2021).

In a talk by Tara Voelker (GDC, 2015), she brings up a few points to why engaging players with disabilities is a thing to aim at; that gamers with disabilities play games more frequently, that they play for more hours a week and play for longer periods of time per sessions. Tara also brings up that players with disabilities have a greater experience and more benefits from playing games and find playing games more important than non-disabled gamers. Tara continues this talk with stating on how this in turn may help the developer as gamers with disabilities are more dedicated customers, more likely to refer games to their friends and they are more likely to buy more titles from the developer if they know that the developer includes features that they need to play games. The work that the developer puts into to making games accessible will result in better games overall.

4. Developing an accessible game

> "One possible way forward when it comes to inclusive game design and development is to diversify the game development team in addition to forming focus groups that match the diversified target group. This could enable a participatory or co-design approach, involving disabled people as early as possible in the design process."(Westin, Brusk & Engström, 2019)

The importance of including the people that the practice is for when developing methods to aid them is also brought up by Faulkner et al (2020), in their study they consulted with focus-groups that consisted of members from the marginalized groups their study focused on, they were able to create guidelines for how to consult and include marginalized groups and bring them into the discussions from the beginning. When it comes to making accessible games, this would mean to bring in players with disabilities into the development from the beginning, either as part of the team or consultants.

Another way to bring in people from the affected group is to let them playtest the games. By doing this, developers will be able to test different aspects of their games, to see if they are accessible. By sampling play testers from the affected group, the information, and data that the developers gather from the playtests will highly reflect the feelings

and thoughts of the players the game is aimed at (Davis, Steury, & Pagulayan, 2005). Examples of this can be seen later in this chapter when some games that have been made to be accessible are presented.
To make an accessible game, there are several resources that a developer can use or that can guide them.

AbleGamers is a foundation that is dedicated to make gaming more accessible. They offer help to both players and developers through the means of peer-counseling, engineering research, user research, professional development, and community and inclusion.

There are websites dedicated to the accessibility of games. Websites such as Gameaccessibilityguidelines.com and Caniplaythat.com both aim to bring up the issue of accessibility to both players and developers. Both websites present guides of what can be done to make a game more accessible, from small solutions that are easy to implement to larger and more complex solutions.

4.1 Tools and hardware

To help a developer gain knowledge of some disabilities and understand how these can restrain players with disabilities while playing games, there are a few tools that can be used. Two examples of tools that can help the developer are the Cambridge Simulation Glasses (Cambridge, 2017) and the Cambridge Simulation Gloves (Cambridge, 2017). The Cambridge Simulation Glasses lets the user experience how it is to have vision loss. One pair of the glasses lets the user experience a mild vision loss, however, by stacking more glasses, the effects become stronger and simulate a more severe level of visual impairment. The Cambridge Simulation Gloves lets the user experience how limited hand mobility can affect while playing games or doing everyday chores. The gloves limit the movement of fingers and thumb as well as the strength of the user's hands, simulating dexterity impairment such as arthritis.

Other tools, for example the Web Disability Simulator (2019), lets the user gain an insight into obstacles that emerge for users with disabilities. The user can choose which kind of disability/impairment they want to experience such as dyslexia, motor impairment, concentration dif-

ficulties, tunnel vision and different kinds of colour impairments. This add-on lets the user place a simulation on their browser to perceive how a website can be experienced with different types of disabilities. There is also hardware that makes it easier for players with disabilities to play games, such as controllers. One example is the Xbox Adaptive Controller (2018) which allows the player to customize their own controller in a way that works for them. This controller lets the player themselves choose the interface for each button. For players who are quadriplegics a controller such as the Quadstick (2014) can be used. By using sip and puff sensors, as well as a lip position sensor, the controller lets the player control the game using their mouth instead of their limbs.

Tools/ Hardware	Auditory Disabilities	Visual Disabilities	Motor Disabilities	Cognitive Disabilities
Cambridge Simulation Glasses		X		
Cambridge Simulation Gloves			X	
Web disability Simulator		X	X	X
Xbox Adaptive Controller			X	
Quadstick			X	

Table 1: A visual representation of what the tools/hardware presented can aid with.

When it comes to tools such as simulation tools, one should have in mind that the experience the user has using the tool may not fully encompass the real experience for a person having the disability. The simulation is just that, a simulation. These tools may give the user an insight of the struggles or issues that a person from the simulated group may experience, but not a full picture of how it is to live with the simulated impairment. VanPuymbrouck et al (2017) presents a critical analysis of disability simulation. One point they bring up is the inconsistent effectiveness of the method, that the use of disability simulation can evoke sympathy instead of empathy. As simulation tools can be a way for an able-bodied person to gain insight in how it is to have a disability,

they can also give the user a false sense of insight (VanPuymbrouck et al, 2017). As such, usage of simulation tools should be done with the knowledge that the simulation tool can help the developer gain an insight, but not fully let the developer experience how it is to live with the simulated disability.

4.2 Techniques and software

There are also techniques and implementation that can be implemented into the game to make it more accessible to the players.

For players with cognitive disabilities, allowing players to start the game without navigating through multiple levels of menus may be a solution, as these can feel confusing and exhausting for the player (Ellis, et al, 2021). One way to make a game more accessible to players with cognitive disabilities is to let the player decide the pace of aspects such as dialogues, having the rest of the game pause while the user is in a dialogue and then letting the player progress the dialogue at their own pace. This will let a player who takes a long time to read get a better grasp of the information that is presented (Ellis, et al, 2021, Craven, et al, 2018, GDC, 2015). Another way to aid a player with a cognitive disability proceed in the game is to let the player have an easy access to hints or instructions to what the current objective is or which actions that a player can take (Ellis, et al, 2021, Craven, et al, 2018, Garber, 2013). This could be shown either on the HUD/UI of the game, the pause screen, on the players command or triggered by the player spending a long time in the game without making any progress toward the current objective (Ellis, et al, 2021, Craven, et al, 2018).

For players with motor disabilities, allowing the players to re-map their button-configurations may allow them to play the game easier (Ellis, et al, 2021, Craven, et al, 2018m GDC, 2015). By letting the players configurate the sensitivity settings on the controller helps to reduce the players muscle fatigue and wrist tension, as well as reducing the impact of simulation sickness (Ellis, et al, 2021, Craven, et al, 2018, Garber, 2013). For players who have motor disabilities and cannot use the standard controller, supporting multiple types of input devices lets the player use their own controller or a specialised controller to play the game (Garber, 2013, Ellis et al, 2021).

For players with sensory disabilities, having subtitles or closed captions for all important spoken lines and audio helps players with auditory disabilities to keep up with the narrative and the things that are happening in the game. On the other hand, having a spoken dialogue or monologue that presents important information in the game will aid players with vision impairment to follow the narrative and be aware of what currently is happening in the game (Ellis, et al, 2021, Craven et al, 2018, Garber, 2013, GDC, 2015). For players with low vision, having non-visual cues, such as unique sounds so that the player can distinguish between them, this would help players to know and expect certain events, such as an enemy coming closer or a collectible being near (Ellis, et al, 2021, Craven, et al, 2018). Another way to help players with vision impairment would be to have a high contrast between the UI and the background. Being able to have the option to let the player themselves adjust the contrast in the game would let players with poor vision heighten the contrast to easier see what's interactable and what is the background. It would also let players with eyestrain issues lower the contrast to play easier (Ellis, et al, 2021, Craven, et al, 2018, Garber, 2013). For players with hearing impairment, one way to make a game more accessible is to provide visual cues for an event happening, instead of just audio cues, such as an enemy approaching or a siren blare to indicate something happening (Ellis, et al, 2021, Craven, et al, 2018).

The solutions here are only a few examples of what can be done to make games more accessible from the software perspective.

4.3 Games made to be accessible

Some games are made with accessibility in mind from the beginning. This means games that from the conceptual stage have accessibility as an important aspect.

An example for this is the game *Marvinter* (2017), that is made to be accessible for players with visual impairments and players with hearing-impairments, as well as players without disabilities. This game is a point-and-click adventure type of game, played on a smartphone or a tablet. The way they designed this game was to have all information available both in sound and in graphics. While playing, the interactable objects was highlighted with a particle effect, letting players who use

the graphics to play easier find them, while at the same time they also had a unique sound effect that let players who relied on sound find them (Brusk & Engström, 2021). In order to achieve this the developers had continuous playtesting with their focus groups, which consisted of eight children with hearing impairments (ages 12-14) and fifteen children with visual impairments (ages 7-16). This gave them valuable insight into how their interaction model could be improved, especially for the players with hearing impairment, one of the ways was to ensure that all the information that was given to the player via sound also had a graphical counterpart (Brusk & Engström, 2021).

Another game that focuses on being accessible to players with visual impairment is *A Blind Legend* (2015), a game that exclusively uses sound as a means for the player to navigate in the game. The game is played on a smartphone or a tablet. The game has no graphics, instead the player moves around in a 3D-soundscape by sliding their finger on the screen. The game uses binaural sound to let the player (with headphones) hear where the sound is coming from. The development of this game was done with the help of a crowdfunding campaign that generated a community of people, companies, and associations. This in turn enabled the developers to playtest with players who are visually impaired and people from associations for people with visual impairments throughout the development process, which gave them input on how to further improve the game (A Blind Legend/DOWiNO, 2015).

Deafverse (2019), is a web-based, choose-your-own-adventure style game designed specifically for deaf players, focusing on deaf teenagers. The game is ASL (American Sign Language) accessible, and lets the player, in first-person experience situations where they get different options of what to do in the situation, such as if they should help a friend immediately or wait until later. The story and options in the game is conveyed to the player through ASL text, and visuals. Deafverse was developed with the experience of deaf creators, as well as resources from the National Deaf Center on Postsecondary Outcomes (NDC) (National Deaf Center, 2021).

4.4 Games that have the option

There are already games on the market that have the option to be more accessible. Games such as *Hue* (2016) and *Two Dots* (2014) that uses colour as a part of the gameplay. *Hue* (2016) relies on the player to change the colour of the background to traverse the levels, and Two Dots (2014) gameplay is to connect two or more dots of the same colour. Both of these games allow the player to add symbols to the games, so that colour-blind players can play the games without losing a grasp of the gameplay. Games such as *The London Heist* (2016), *Everybody's Gone To The Rapture* (2016) and *Legend of Grimrock* (2012) are just a few examples of games that support more than one kind of input device which gives the player options for playing the game. A player that may have trouble playing with one kind of device such as keyboard/mouse, can play the game using a controller. Other games, such as *Assassin's Creed Syndicate* (2015) and *Skyrim* (2011), has reminders of the game's current objective which helps players who have memory issues or a hard time processing information.

There are many games that are made with the intent to entertain and still offers the option to make aspects of the game accessible. The games presented in the previous paragraph are by far not the only games that have options to make the games more accessible. Many indie and Triple A games has options that enable more players to access and play them. As seen in both this and earlier headings (4.2) to make a game accessible, there is at times not much that needs to be implemented in a game to make it accessible to more players. The aim does not need to be a fully accessible game for exactly every player that might come across it, but by having options such as allowing the player to re-read conversations in game, or having all important dialogues subtitled or the support to use different input devices all enable more players to play the games in different ways.

4.5 Critical Disability Studies

A thing to take into mind when working with disability and marginalised communities is to challenge normativity in oneself. Fine (2019) presents five moorings for researching disabilities. Firstly, to contest normalcy, binaries, and stratification. What this means is to question how one has

been taught to see the world, who gets to decide where lines between binaries are drawn, or which lines are to be drawn. The second being to theorize and organize through intersectionality, to study ableism and its consequences as well as how to resist it through an intersectional framework. The third being the inclusion of disabled people in projects that focus on their experiences and expertise. This is rooted in the principle: *No research on us, without us*, meaning that the researchers should do their research with disabled people instead of on disabled people. The fourth mooring is that the performances of the lives and solidarities of disabled people should be curated at the membrane of art and social science. Meaning that consideration should be put into how the research should be portrayed in performance, folk art and/or music so that critical discussion about ableism can be taken into popular discourse and out of hidden away spaces. The final mooring, the fifth one, how design should be for transformation and not just inclusion, accommodation, or integration. Meaning that the designer needs to focus on the experiences and lives of people with disabilities and use that as the start for the design so that they can take on explicit and implicit ableism (Fine, 2019).

When games and players who have disabilities are brought up in discussion there seems to be with the angle of using games as a tool to help disabled players educationally or therapeutically, rather than being a tool for entertainment. In these cases, the disabled players become framed as treatment-receiving objects and the games tend to be framed depending on their capabilities to alleviate the troubles that are linked to the players disabilities (Wästerfors & Hansson, 2017). The focus on this angle results in that the experience of the players, where they play games for entertainment, challenge, socialisation, or relaxation may be ignored (Ellis & Kao, 2019).

In a systematic literature review, Sousa (2020) presents an insight in how the academic world views players with intellectual disabilities. This review further exemplifies the view of players with disabilities that Wästerfors & Hansson (2017) presented. In the article, Sousa mentions that players with disabilities are in research approached in a way that focuses on the idea of games needing to be an educational or therapeutic tool for them, rather than a cultural expression that is accessible to them. This is something that shows the need for merging the

fields of critical disability studies and game studies (Sousa, 2020).

5. Discussion

As shown in the previous headings there are different ways of making a game more accessible, either through the hardware, the software or through both. Creating a game can be done with the intent of being accessible from the beginning or to have options for the players who need it.

Some solutions may make the game more accessible to more players than the intended group. For example, subtitles, which are known to aid deaf players could also help players who are autistic, have sensory disorders, language processing disorders, or other cognitive disorders (Thompson, C., 2019). By adding subtitles, the developer may have made their game much more accessible than they initially thought. Other example of this is to have important objects stand out from the rest of the background or an in-game GPS that helps players to navigate the levels. These are functions that help both players with visual impairment and players with cognitive disabilities (Voelker, T., 2015). By being creative with how solutions are incorporated in games, accessibility can be incorporated in a way that is natural, rather than being shoehorned in the final stages of development.

In making games more accessible, the players that previously may not have been able to play can reach into the gaming community. As stated previously, gaming can be a way for players with disabilities to join in on a community and to connect to other people. By connecting to others and escaping the isolation that many housebound people with disabilities face, their quality of life may heighten considerably.

On the topic of a fully, 100% accessible game, Cherry Thompson brings out that from a designer point of view, they do not think that a 100% accessible game would be possible. That all games need to have a barrier of some kind to make them into games (Thompson, C., 2020). Aiming to make a game accessible for exactly every player can be likened to aiming to make a game that exactly every player think is fun to play. There will always be someone who has a different opinion

and will not find the game entertaining. However, this would not stop a developer from making a game that most players find fun, in the same way, the developer can aim to make their game accessible to as many players as possible.

Something to take from this chapter is to start somewhere, it does not have to be perfect, small steps are okay to begin with. Have the thought of accessibility and accessible games in mind while making games. Listen to the community and look up information. There are many sources online that both educate and can help you get in touch with people with disabilities.

5.1 Hidden biases

In one of their talks about accessibility in games, Cherry Thompson brings up the topic about bias and the need for rethinking about what bias that a developer can have about accessibility. They continue this with; "the user is not broken of flawed, our design just isn't successful" (Thompson, C., 2019). Instead of assuming reasons why the player can't/won't play with the intended design, turn it around to re-evaluate why the design is not accessible to the player. By realizing, evaluating, challenging, and correcting biases in the development team, they can more forward to create better and more accessible games. This thinking ties into aspects of critical disability studies, where the process of challenging one's normativity is a part of working with marginalized groups and to focus on the experiences of the people with disabilities (Fine, 2019).

5.2 An ideal aim

An ideal aim to make accessible games would be to include the group that the game should be accessible to from the early planning stages of the development process, to have them as a part of the development team. An example for this is the game Deafverse (2019), where a large part of the developers themselves are deaf, and thus have first-hand experience on different aspects that would make the game more accessible to just deaf players. However, many developers are non-disabled. For this situation taking in consultants and reaching out to the community would be more appropriate as they then can get

information on both issues and solutions from players who experience them first-hand. This is something that needs to be done early in the development process and integrated in the development, and not as an afterthought.

5.3 What is good enough?

As much as anything is better than nothing, there should still be a reasonable level that developers should adhere to when developing a game to be able to call it accessible. For example, using a simulation tool for a few hours may give the developer using it an insight, but the developer should not just rely on their own experience with the tool, as the experience they have had may not align to the experience of the simulated group. In the same sense, a developer asking maybe a friend with disability for help could be a beginning but should be followed up by talking to more people from the community. As much as that one friend probably gives a portrayal of their experience, one person's experience cannot represent a whole group. Therefore, having contact with more than one person from the community should be put as standard practice when developing a game to be more accessible. In the end, who gets to say if a game is accessible or not? There is not a step-by-step guide in how to make a game accessible. As I see it there are two ways to look at it. Firstly, the developers should from the development phase of the game have contact with the community and taken their input and feedback through means such as counselling and playtesting (something to note here is to be respectful while approaching the community, as they are not just an extern resource). The second option is to approach organizations like AbleGamers with your game and having people from the community playtesting the game. Both of these ways do end in having the people who are in the marginalized community give feedback and having the final say in whether or not the game is accessible.

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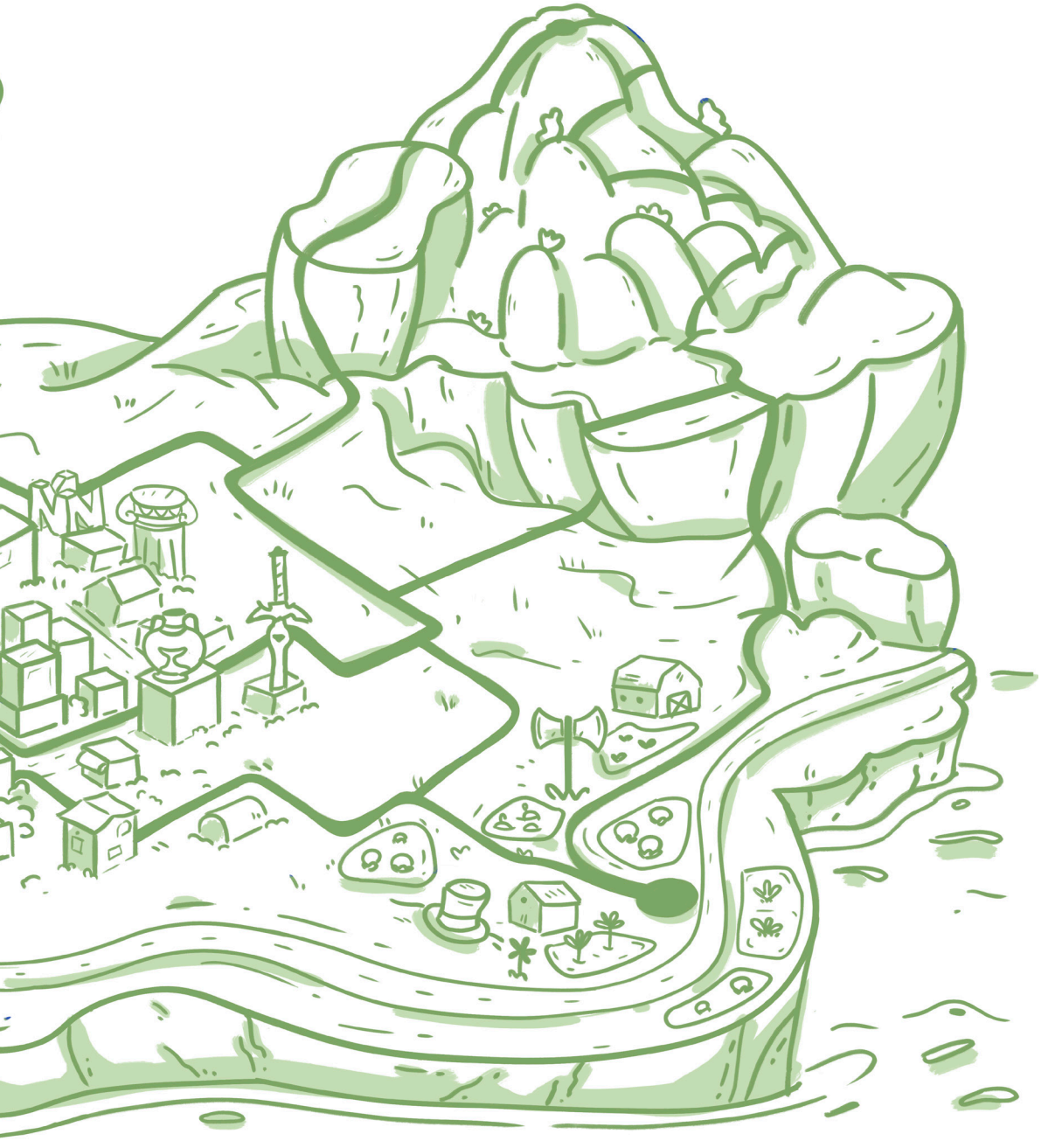
GUX IN CULTURAL ENTANGLEMENT



Chapter 9

Outcomes of a Non-Diverse Game Industry

Ülkü Kutluhan Bayrak

Abstract

Misrepresentation is a crucial problem of the gaming industry and happens in many different forms. While this mistake affects the employees of a minority group in the industry, it also negatively shapes the players' perspective towards the minority groups. This paper goes through such problems and suggests a way to overcome this problem, hiring diverse talent.

Keywords: diversity, representation, workplace, inclusion, game, etc....

1. Introduction

In this chapter, the various effects of non-diversity and its outcome misrepresentation have been discussed. As the game industry progresses, it maintains being a non-diverse community, and recently, it has been receiving backlashes because of this problem. The discussion starts by presenting misrepresentation examples from various games and later on addresses the harmful effects of misrepresentation. Misrepresentation is a severe issue that can elicit racial biases. Next, the lack of diversity in the industry is examined. Industry's non-diverse structure and misrepresentation are interconnected, and diversity can play an essential role in addressing the issue of misrepresentation. To further dive into the mentioned problems, interviews with two prominent fig-

ures in the game industry are conducted, Souvik Mukherjee, a game scholar, and Rami Ismail, a game developer, speaker, and consultant. Industry's standard practices that try to fill the void of non-diverse working spaces are not diminishing the misrepresentations, furthermore, the harmful effects that come along with it are discussed in this chapter. Currently, the game industry is using consultancy as a band-aid to cover its wounds. However, neither the consultancy alone nor the way consultancy is approached in the industry are reliable enough to solve misrepresentation issues in games. The games that are exemplified over the course of this chapter are indicative of this notion. Construction of "other" is highlighted as another reason for misrepresentation and non-functional diversity, or in other words, tokenism, has laid stress on as an inefficient practice. Mukherjee and Ismail have discussed their own experiences and opinions on these subjects. Finally, this chapter proposes solutions to the problems occurring in the game industry based on what is uncovered.

2. Problem

2.1 Game Content

One of the most noticeable harmful effects is misrepresenting a specific culture in games. In this paper, misrepresentation also includes lack of representation and stereotyping as those also contribute to misrepresentation. The reason why a non-diverse workplace can not represent other cultures or ethnicities is that "the Western view of the East is greatly influenced by the stereotypical negative images that Hollywood films consistently present" (Arti, 2007, as cited in Qutub, 2013).

The idea of a homogenous Middle East is present in most games set in the Middle East. This is a by-product of stereotypes of Middle Easterns shown in the media. Because of this, there is a general tendency to think all Middle Easterns are identical. In reality, the Middle East is diverse in terms of ethnicity, culture, religion. In Battlefield 3(2011), the level "Fear No Evil" is set in Iran, where only 2% of the population speaks Arabic, yet there are Arabic writings on the shops instead of Persian, which is the official language of Iran. (Ibaid, 2019). Similarly, Muslim depiction in games suffers from the same problem. There is

a visible homogenous Muslim idea in games. In Call of Duty: Modern Warfare 2(2009), levels from Pakistan and Afghanistan have Arabic boards or Arabic speakers with Saudi Dialect in the game (Ibaid, 2019; Ashcraft, 2013). To give a more relatable example, Deleon(2009) states, "How dumb would it look to be playing a game set in Paris with all the street signs in Dutch or Swedish?". These examples indicate that there were no representatives from that respective country involved in the game's production. These issues are easy to identify in the eyes of players that know Urdu, Pashto, or Persian. Despite these obvious mistakes in the eyes of many, the aforementioned games all have passed production and published all around the world.

Regardless of the visuals, the content of the game is also an issue. Misrepresentations are prominent in the games set in the Middle East. Saeed(2017, as cited in Nurullah, 2010), when talking about misrepresentations, states it can "be linked to the development of 'racism,' namely Islamophobia that has its roots in cultural representations of the 'other'.". In a research, Saleem(2018) investigated whether Saeed's statement done for the media also applies to a game context. The effects of using negative stereotypes in other forms of media were known, but it was not investigated in a game context. The results indicate that "negative video game stereotypes are associated with negative implicit attitudes"(Saleeem, 2018). Furthermore, another research explored cultivating the effect of stereotypes in video games. Cultivating effects were investigated for other forms of media, and one of the results states that participants believe what they see on television even though they are aware it is mostly stereotypes (Melhem & Punyanunt-Carter, 2019). The research for cultivating effects on games indicates that video games are predictive of a higher frequency of play is linked to less favorable beliefs about Blacks on White video game players (BEHM-MORAWITZ & TA, 2014). This outcome shows that it is crucial not to misrepresent a group of people. The common idea surrounding the game community argues games are not real or "alternative universes"(Hoffman, 2014). Still, research clearly suggests there are real-life implications of these fictional worlds, and games should be treated as a medium that influences people.

Another harmful effect is offending people and receiving backlash from communities. When a company does not know the content they

are dealing with, there is always a chance that content is sensitive to a group of people. Games such as Call of Duty: Modern Warfare(Plunkett, 2013), Little Big Planet(Fahey, 2013), Street Fighter V(Frank, 2017), The Legend of Zelda: Ocarina of Time(The Game Theorists, 2014), and Fallout 3(Good, 2013) all had religious elements in them and all faced a considerable backlash forcing the companies to recall the game, remove content or not getting released in a country. These events indicate that the companies do not do enough research, and these companies do not know the content they are creating their game with. Three of the games mentioned above had the same issue where there were Islamic chants and Qur'an references in their level. This is a prime example of how the industry does not learn from its mistakes and continues making them.

2.2 Industry diversity

According to the data gathered from the International Game Developers Association(IGDA) in 2019, %83 of the industry says diversity in the workplace is very or somewhat important, which is a record in the Development Satisfaction Survey(DSS). Interestingly, the majority of the participants thought the industry is more diverse than before. Even though the game industry feels more diverse than ever, there is apparent underemployment of non-European/non-white in the gaming industry. According to date, the industry was 68% European in 2017 and 69% in 2019 (Weststar et al., 2019). IGDA's data is especially valuable considering it includes people from MENA(Middle Easterns and North Africans) as a subcategory of West Asians for ethnicity. This gives us a clear angle to see how underemployed both Africans and West Asians are. With only 2% for both, they are tied for the least employed.

Voice acting does not get much attention in diversity discussion as it is behind the scenes. In recent years, talks about diversity in voice acting became louder and louder in other forms of media. The main controversy surrounding these discussions is whether voice actors and characters should be of the same ethnicity or not. In regards to the discussion, Hank Azaria apologized for voicing Apu from The Simpsons(Groening et al., 1989–2021) and announced he would no longer voice him. Furthermore, Dr. Hibbert is one of the few POC characters in The Simpsons(Groening et al., 1989–2021) and was voiced by a

white person before. The Simpsons announced that Dr. Hibbert's voice actor will be changed to fit the character's race. This is not The Simpsons(Groening et al., 1989–2021) exclusive issue as other shows also followed the series. Jenny Slate, a white actor, voicing Missy from Big Mouth(Goldberg et al., 2017–2021), a black character, apologized for voicing a black character and announced she would no longer voice her.

Regarding diversity in voice acting, the bad track record of lack of diversity is also persistent in the video game industry. It is quite common in the game industry to have a white voice actor acting as a part of any other race, ethnicity, and religion. Back in 2016, Daniels made a list of games that had white actors voicing black characters. "Even though video game casts are more diverse than ever, the talent doesn't often reflect that. Kait Diaz (Gears series), Nadine Ross (Uncharted 4: A Thief's End), Chloe Frazer (Uncharted series), Clementine (Telltale's The Walking Dead), and Maya Brooks (*Mass Effect 3*) are just some women of color in video games who are voiced by white women. Mirage (Apex Legends), Delsin Rowe (inFamous: Second Son), Pagan Min (Far Cry 4), Kai Leng (*Mass Effect 3*), Dudley (Super Street Fighter IV), Balrog (Street Fighter series), Rico Rodriguez (up until Just Cause 4), and Kojo Agu (Halo 3: ODST) are some of the men of color who are voiced by white male voice actors.". This is only the tip of the iceberg and not only a black and white issue. The same things happen to every ethnicity. For example, both Tilkici and Zara from Battlefield 1(2016) do not have their respective ethnicities as voice actors or models. Another example is Sniper Wolf from Metal Gear Solid, who also did not get a voice actor regarding her ethnicity. All of these characters settle with other voice actors trying to make accents.

Voice acting is also suffering from the same problem as game content, a non-diverse workplace. "Let's face it, the majority of people making and writing for games are white, and the voice they have in mind is a stereotypical one that doesn't accurately represent our community," says Elle Osili-Wood in the interview done by Wen(2020). Explaining how supposed to be a representation becomes a misrepresentation. This leads to actors being forced to make "accents" or get told they have a "white voice" (Wen, 2020). This is a prime example of how the industry looks for stereotypical voices rather than genuine or voices

that are a part of the represented community. The industry does not want the voice of an "X-ethnicity-", however, wants an "X-ethnicity" voice. Because of this stereotyping, another issue arises. Wen(2020) argues some voice actors have received feedback during their audition for sounding "too black" when they applied for a role where the character is non-specified. On the other hand, they also received feedback as "not black enough" when auditioned for a black role. "Black voice actors and voice actors of color aren't always given the opportunity to play characters who look like them, let alone play characters who don't" argues Flores(2020). Giving us the grand scheme of voice acting, people of color can not even get the jobs that are supposed to represent themselves. It is also important to highlight that this chapter does not argue that a character should be only voiced by their own respective ethnicity, such as Arabs should only voice Arabs and Turks should only voice Turks, etc. "It is not a problem for people of different to voice other cultures, that's part of acting, but what is a problem is when you have characters with different backgrounds, with a different religion, with different skin color and you have no idea what that experience is like, it kinda plays off as a stereotype," says Jayden Libran in the interview done by Chalk (2020) and highlights an important deciding factor, experience. It is also essential to consider the actors' experiences and how these experiences match with the characters. What should not be forgotten is that the character is there to tell their story and as Abubakar Salim says, "There is a beauty in the storytelling if it is being told by someone who is as close to the themes being presented." (Wen, 2020).

3 Interviews

In the previous section, examples indicate that neither someone from where the game set was present in the company nor a consultant was hired. Although some of these games had consultants, they could not prevent these issues from arising. To further dive into this, two of the prominent figures in their fields have been reached out for this paper. Souvik Mukherjee, a game scholar, and Rami Ismail, a game developer, speaker, and consultant. These personal interviews have been carried out online one-on-one to discuss the industry's current state regarding the misrepresentation in games, the usage of consultancy, and diversity.

3.1 Interview with Rami Ismail - Consultancy as Bandaid

According to Ismail, “more and more companies are getting consultancy for their games,” however, the way industry approaches consultancy is not proper. The first problem arises from the start of the project. When companies plan on making a game outside of knowledge, “consultants never involve from the start.” Ismail states. “When companies mess up, they react, “We are going to talk about Muslims, and we have no Muslims in the building,” and then they start searching for a consultant, but they already have so much work done,” Ismail says. The power of consultants is also an issue. Ismail states that “The power of a consultant is minimal and a very controlled one to fit the narrative.” and continues to talk about the decision-making power of consultants: “I pointed out certain things in multiple projects I disagree with, but they continue going through with it. “How to minimize the harm caused by this decision?” they ask.” This example indicates a consultant is used not for the wrongs but to minimize the harm caused by the mistakes. As mentioned earlier, the unification problem is prevalent; the industry’s sense of a unified Muslim, unified Middle Eastern or Arab idea is visible as Ismail says he was asked about Muslims in West Africa and Arabs from Arabian Peninsula even though he is known to be from North Africa. Moreover, he gives a great example ”You are European, right? Tell me about France” (R. Ismail, personal communication, February 19, 2021).

Industry’s current way of using consultancy is very inefficient and does not benefit both gamers and companies. The resulting games also suggest this premise. Based on Rami Ismail’s experience and comments, it is visible where the improvements should be made in order to find beneficial consultancy. Consultants should be hired from the culture influenced or game set. Moreover, the consultants should be hired and worked with from the start of the project and should have some kind of influence in design decisions and should be used to eliminate misrepresentations and offensive content rather than minimize the harm caused by them.

3.2 Interview with Souvik Mukherjee - Construction of Other

Mukherjee believes the reason why there are many misrepresentations in games is much deeper than mistakes."The issue is the construction of other. West has a certain way of constructing the East" says Mukherjee(S. Mukherjee, Personal Correspondence, March 3, 2021), indicating problems arise from a place much more general than games. Whether or not this is how the West perceives the East or not, meaning it is unconscious or not, there is a certain way the West is historically constructing the East. Mukherjee(S. Mukherjee, Personal Correspondence, March 3, 2021) gives an example by referencing Edvard Said's book Orientalism and states, "The West constructs orient as something distant, something other, something exotic. It always constructs as the opposite of the West. While this is not only a game-related issue but also prominent on games as well." It can be argued that these constructions can be preventable by a diverse background of developers that are not only from the West, according to Mukherjee(S. Mukherjee, Personal Correspondence, March 3, 2021), the issue is not that easily fixable. "If you look at Assassin's Creed games(2007-2021), Ubisoft writes that "these games were made by people from different fates and cultures. "But nevertheless, they always portray a certain kind of East. Certain kind of religion. There are different kinds of ways to practice Islam. Then how is it not possible to notice these kinds of differences?" So the idea of a diverse workspace might not be the sole preventor of misrepresentations. Mukherjee(S. Mukherjee, Personal Correspondence, March 3, 2021) argues that this is not something you can only leave to the employees to handle. It should be a company mission as well. "But it is not just people of multiple races and cultures being employed in a company that makes the difference. It is I think also up to the higher management, the ethos of the company, the ethics of the company. Because what if nobody cares what you say? Then it is tokenism. You can have a token Turkish person and a token Indian person and a token person from Egypt but then ultimately the game made in a very European perspective." Later he gives an outstanding example that shows that tokenism is not imagined or theorized but rather the reality. "Far Cry 4(2014), which is based in Nepal, is so stereotypical as well, they sent a team of their own, and the only local guy who came with them did not speak the Nepali language. He was

born and brought up in Europe, very strange really." says Mukherjee(S. Mukherjee, Personal Correspondence, March 3, 2021), showing a case of tokenism that indicates the severity of the bad practices that are done in the game industry.

The examples of Assasin's Creed(2007-2021) and Far Cry 4(2014) indicate that only employees alone can not be enough to counter misrepresentation, but it is undoubtedly an important piece. A diverse workforce with agency and power and higher management supporting and respecting them is the key to preventing misrepresentation.

4. Real Solutions/Joint Opinions

The current way of using consultancy in the industry will not solve any issue of misrepresentation or offensive content. Although nothing can completely solve these problems, hiring diverse talent will help diminishing most. With a diverse workplace that has many different cultures, firstly, there will be a lot more cultures that companies can correctly represent with their employees' inputs. Secondly, companies will understand that every culture is different from their stereotypes, knowing this will help tremendously in consultancy work. When companies become aware that the knowledge they have about the other cultures is mostly not true, they will rely more on consultants. The industry will hire consultants more and start working with consultants earlier. Consultants will have more power to influence the game as their input will be more valuable. Unfortunately, this might not be enough as well. it is crucial to indicate something both Souvik Mukherjee and Rami Ismail stated, one person can not represent a whole culture (R. Ismail, Personal Correspondence, February 19, 2021; S. Mukherjee, Personal Correspondence, March 3, 2021). Companies should not think they will achieve a completely accurate representation with only one person. For example, in countries that have multiple ethnicities, although there might be a collective culture, there are also some different cultural practices, approaches, or have different additional cultures. Further on, ethnicity does not mean everybody is identical. People with the same ethnicity can have different religions, different sects of the same religion, or generally different ideas on pretty much anything. When you are a foreigner to the culture, it is very easy to see it as a homogenous crowd, but the more you delve into it, the more you realize it is

the complete opposite. These are important points that the industry should consider upon making a game set in a culture different than their own. In the interview done with Souvik Mukherjee, one of the points that came up is playtesting and researching with people from different cultures and playtesting and researching with as many people as possible. “When these games are researched and playtested they should be researched and playtested by people from different cultures and yes they should be developed by people from different cultures.” says Mukherjee(S. Mukherjee, Personal Correspondence, March 3, 2021) and this might be an excellent way to decrease the representation mistakes and offensive material in games. To sum up, a diverse workplace, a beneficial consultancy, and researching and playtesting with people from the cultures that the game is set in and also from many different cultures are crucial to create a correct representation in games (R. Ismail, Personal Correspondence, February 19, 2021; S. Mukherjee, Personal Correspondence, March 3, 2021)

In terms of Voice Acting, the problems arose from a lack of diversity as well. Because of the lack of diversity in the workplaces that make games, the created characters are consistent with stereotypes. Due to these misrepresented characters, the voice actors, even though having similar experiences with the character, are not hired because they are simply not that stereotypic.

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Chapter 10

Tackling Toxicity in Multiplayer Games: The Game Behavior Change Wheel Approach

Ziwen Michael Song

Abstract

Toxicity has been a prevailing issue in competitive multiplayer games. In this study, we propose the Game Behavior Change Wheel (GBCW), a new approach for tackling toxicity in competitive gaming. A case study was also carried out using the GBCW to design in-game interventions against the flaming behavior in Overwatch. The case study shows that the GBCW can develop a comprehensive view of the toxic behavior in the game and also provides systematic guidance on the intervention design against toxicity.

Keywords: Overwatch, Game Behavior Change Wheel, Behavior Change Wheel, Flaming, Toxic Behavior

Note: The text contains some instances of offensive language due to the research topic

1. Introduction

It has been a long day at work. But now you are back at your cozy apartment. To blow off some steam, you boot up *Overwatch*, settle on the supportive character Mercy and be ready to be the unsung healing hero. The fierce competition is pushing your limits. Daring in every direction, you are trying to cover all your teammates. Sadly, the damage

character Kenji on your team got fragged. Right after the mishap, a chat message pops up on your screen: "Mercy, you f**** noob". The dopamine level in your brain takes a nosedive and the next thing you know, anger, shock, and sadness are overtaking you. The initial hope to release that pent-up energy from work is nowhere to be found for the rest of the night.

The demoralizing incident above happens day-to-day in many competitive multiplayer games. In a study investigating cyberbullying, another kind of toxic behavior in online games, 62.12% of the 1,033 participants stated that cyberbullying happens often or all the time in online gaming environments (Fryling et al., 2015). Even more disturbing are the negative impacts on players from these toxic encounters: both the bullies and victims reported a decrease in social interactions and self-esteem while aggressiveness, stress, anxiety, anger, and depression all saw an increase (Fryling et al., 2015). What's worse, the players are not the only victim in this situation: the director of *Overwatch*, Jeff Kaplan, said toxic behavior has also negatively impacted developers and slowed *Overwatch* development in 2017 (Hood, 2017).

Multiple research has been conducted on various aspects of toxic behaviors in online games, including prevalence and negative impacts (Fryling, 2018; Fryling et al., 2015; McInroy et al., 2017), the potential causes of toxic behaviors (Cotler et al., 2017) as well as the characteristics of these behaviors (Kwak et al., 2015). However, there is only limited research on how to design toxic behavior interventions, most of which also with a narrow focus on keyword filtering via machine learning (Märtens et al., 2015; Murnion et al., 2018), addressing the toxicity only with restrictive measures instead of holistically.

This study proposed the Game Behavior Change Wheel (GBCW), a systematic framework guiding the design process of behavior change interventions against toxic behaviors in online games. A case study on *Overwatch* was also conducted to demonstrate the process of applying the GBCW, with several tentative intervention designs against flaming in *Overwatch* suggested at the end of the process. Despite having only *Overwatch* as the study object, applying the GBCW is independent of the characteristics of a specific multiplayer game and thus can be easily transferred to other games as well.

2. Background: toxic behavior and the Behavior Change Wheel

Toxic behavior is an umbrella term that accounts for a variety of negative behaviors, such as flaming, cyberbullying, griefing, and cheating. In online competitive games, toxic behavior has been a pervasive issue and the current countermeasures in games in general approach the issue from only punitive and restrictive angles (Adinolf et al., 2018). The efficacy of the measures is also doubtful as players do not perceive measures such as reporting systems to be effective (Türkay et al., 2020).

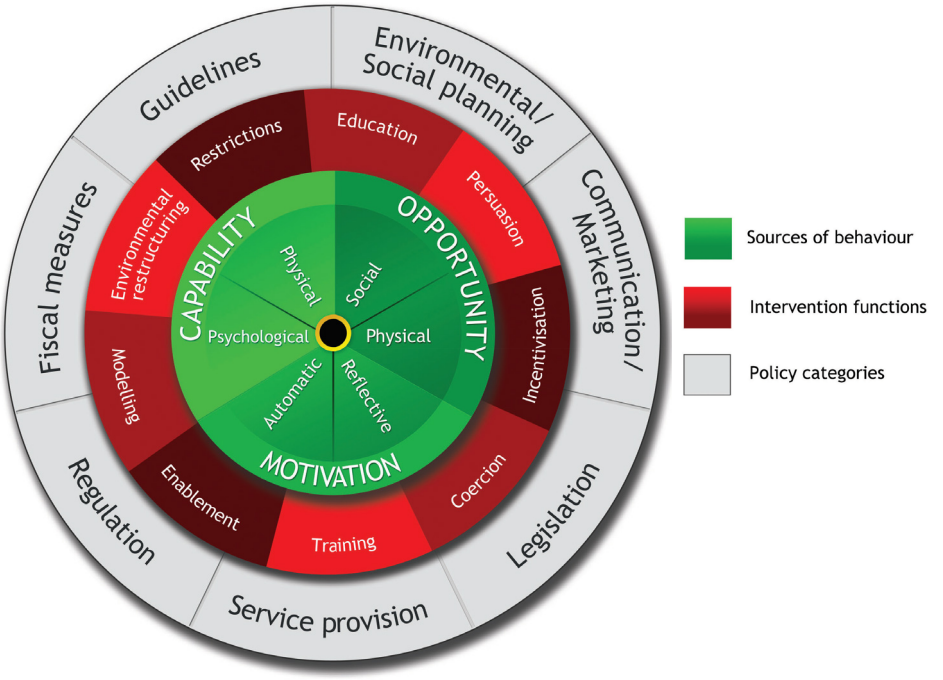


Figure 2.1. Behavior Change Wheel (Michie et al., 2011, p. 18). The permission to use the graph is granted by Professor Susan Michie.

In the field of behavioral intervention research, multiple frameworks have been proposed to design behavior interventions to promote healthy behaviors against common health issues such as smoking and obesity (Michie et al., 2011). The Behavior Change Wheel (BCW) (see Fig. 2.1), proposed by Michie et al., is one framework that synthesizes other 19 existing behavior change frameworks identified from a systematic literature review (Michie et al., 2011). According to their review

(Michie et al., 2011), most intervention designs follow the "ISLAGIATT" principle (It stands for "It Seemed Like A Good Idea At The Time"), which anchors a large part of the design process solely on the non-evidence-based judgment from intervention designers. Consequently, they often do not produce effective results for the lack of an understanding of the nature of the target behavior.

The BCW tries to ground the intervention design on evidence by incorporating into the design process the COM-B model, a model analyzing why a specific behavior happens. Despite focusing on real-world issues, the COM-B model is largely independent of the context where a behavior happens, which provides a foundation to adapt the BCW to tackle toxic behavior in the virtual game world.

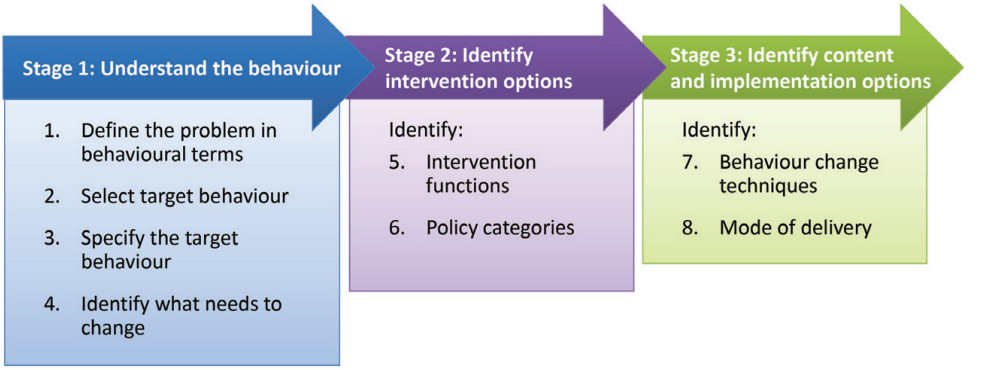


Figure 2.2. Behavior Change intervention design process (Michie et al., 2011, p. 25). The permission to use the graph is granted by Professor Susan Michie.

To better adapt the BCW to solve toxicity in games it is important to have a general idea of the process of the BCW. The general workflow of intervention design with the BCW involves three stages (Michie et al., 2011) (see Fig. 2.2): stage 1 centers on analyzing the nature of the behavior (see Fig. 2.3), concluding in step 4 with an evaluation of the target behavior with the COM-B model. This corresponds to the inner green circle in the BCW, a model of behavior that marks Capability, Opportunity, and Motivation as three minimum components necessary to initiate a specific behavior. Each of the components can be further divided into more specific components as shown in Fig. 2.3.

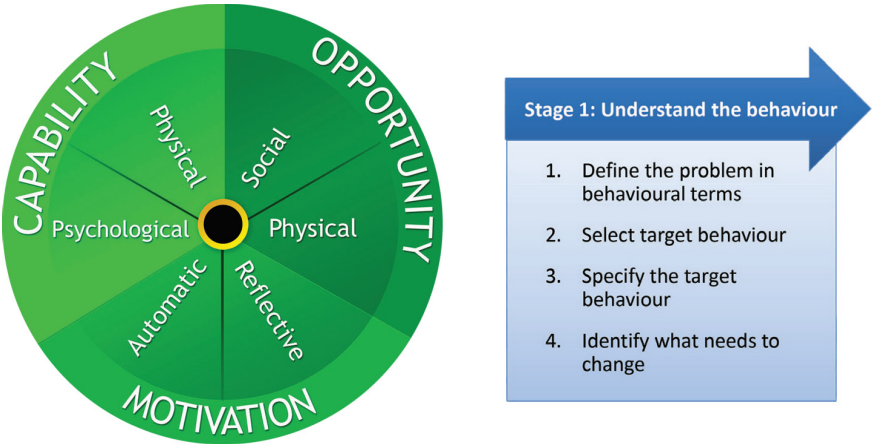


Figure 2.3. The COM-B model and stage one.

Stage 2 identifies intervention functions and policy categories (see Fig. 2.4). Step 5 specifically investigates and compiles a list of intervention functions, chosen from the red middle layer of the BCW, that are capable of influencing the target COM-B components identified from Step 4. The red layer consists of nine intervention functions capable of influencing the components in the COM-B model. Step 6 specifies the real-world policies that can support the delivery of the intervention functions from Step 5. These real-world policies are chosen from the outer layer of the BCW, which consists of seven categories of policies able to support the implementation of the intervention functions.

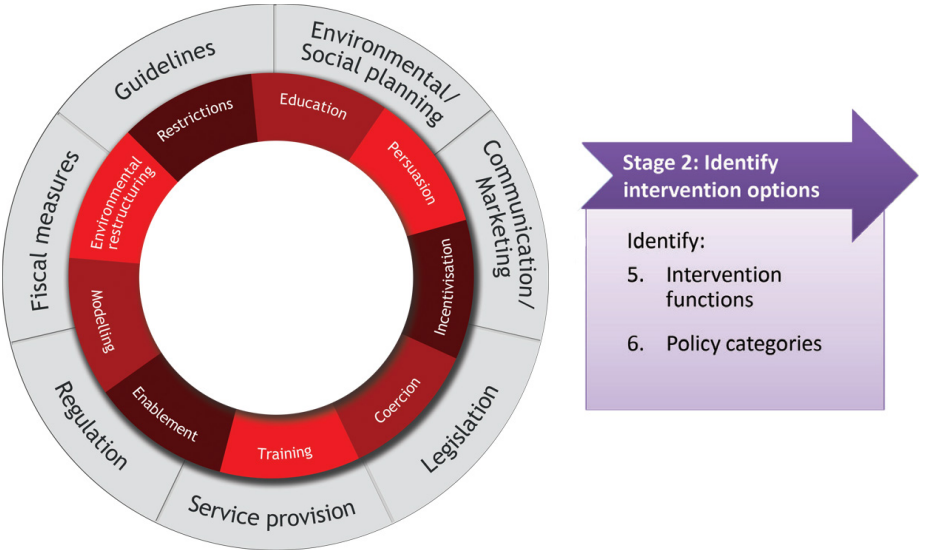


Figure 2.4. The intervention functions, policy categories, and stage two.

Stage 3 focuses on specific Behavior Change Techniques (BCT) of instantiating certain intervention functions and the mode of delivering them (see Fig. 2.5). For example, giving feedback on behavior or providing information about social and environmental consequences are two BCTs to materialize the education intervention function. These two techniques can then be delivered to the target audience in different modes such as in a face-to-face support session or via distance media like the Internet or TV.

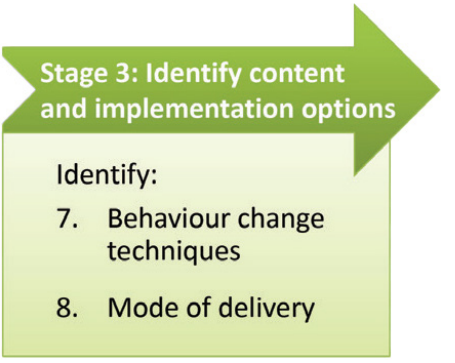


Figure 2.5. Stage three.

3. The Game Behavior Change Wheel

This study proposes the Game Behavior Change Wheel (GBCW) (see Fig. 3.1), a modified version of BCW aimed at designing interventions targeting the virtual game world. Several changes to the general intervention design process have been introduced to better suit in-game behaviors.

The GBCW brings in a few changes: the physical capability subcomponent of Capability in the center wheel is removed because initiating skillful behaviors in the virtual world is mainly a mental effort that requires acquaintance with the game mechanics more than with the body movement. The physical opportunity is also replaced by mechanics opportunity to reflect the opportunities presented in the virtual world that is bound by the game mechanics. The enablement intervention function is removed because it refers to "Increasing means/reducing barriers to increase capability (beyond education and training) or opportunity (beyond environmental restructuring)" (Michie et al., 2014, p. 112) such as "surgery to reduce obesity" or "prostheses to

promote physical activity" (Michie et al., 2014, p. 112), which only targets at the real world. The outermost layer now represents the two ways that in-game interventions can be directed: systemic and agential. This taxonomy comes from *Characteristics of Games* (Elias et al., 2012) where "a characteristic is *systemic* if it depends mainly on the game as a system (e.g., on the rules) and *agential* if it depends primarily on the player base" (p. 8). When designing interventions, designers should think about whether focusing on modifying the rules system or giving more attention to the player base. The two-way arrows between the intervention functions and in-game intervention designs emphasize the back-and-forth workflow between them.

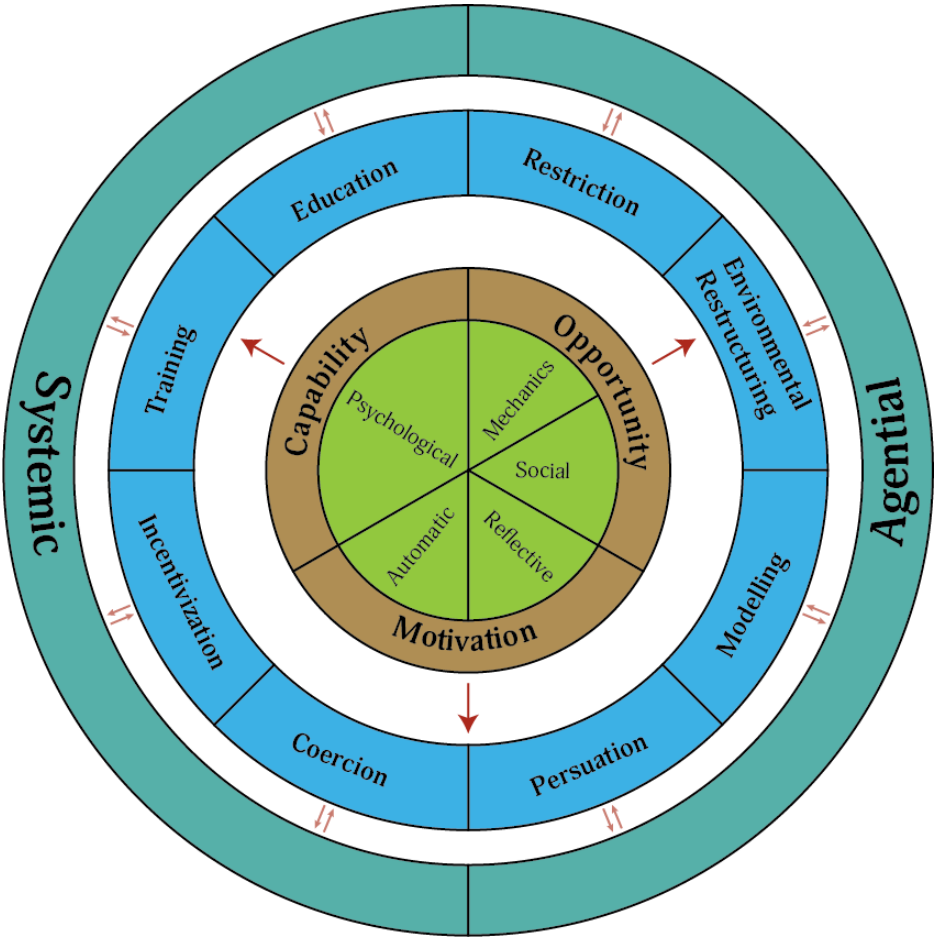


Figure 3.1. Game Behavior Change Wheel.

In the new intervention design process (see Fig. 3.2), Step 6, Step 7, and Step 8 from stages 2 and 3 of the original workflow are disregarded because they represent policies, behavior change techniques, and modes of delivery that are tailor-made for real-world scenarios thus unfruitful for the game context. An example of the intervention for the game world would be that in *League of Legends* there is a text hint showing up on the pre-game loading screen reminding players that harassing their teammates will significantly impair their performance. In the game world, no fundamental physical limits exist on what policies, techniques, and modes of deliveries are possible since they are only bound by computer algorithms. These interventions can enjoy much more design freedom than their real-world counterparts. As a result, stages 2 and 3 are streamlined as "Identify intervention functions" and "Design in-game implementations." But that is not to say that there is no limit when designing these interventions. Games, as a cultural phenomenon, not only are embedded in a specific real-world cultural environment but also have often developed their unique in-game culture. These cultural limits can not be overlooked when designing in-game interventions.

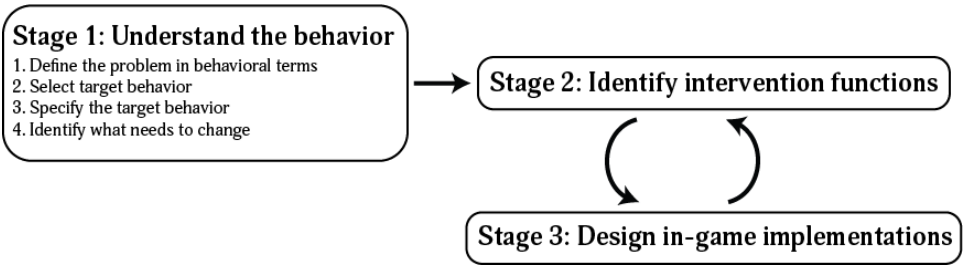


Figure 3.2. Game Behavior Change intervention design process.

The circular interactions between stage 2 and stage 3 correspond to the two-way arrows in the GBCW. After identifying the intervention functions capable of influencing the target components from the COM-B model, designers are encouraged to go to stage 3 to design preliminary in-game implementations delivering the functions and then evaluating the implementations based on the "AAN" criteria(Affordability, Acceptability, Negative Impact). The AAN criteria cater to the need of game development, which evaluates the cost, the acceptance in the player community, and the potential negative effects of the intervention design. If the evaluation suggests that the implementation is unfavorable, designers could either come up with new implementa-

tions delivering the same intervention functions or try out other identified intervention functions and design implementations for them.

4. Understanding flaming in Overwatch

To further demonstrate the power of the GBCW approach, we conducted a case study on *Overwatch*, a team-based competitive online multiplayer game developed by Blizzard Entertainment, to design in-game behavior interventions against toxic flaming behavior in the game. Flaming is a common form of toxicity in game communities, referring to behavior intended to insult other players, frequently accompanied by profanity (Lapolla, 2020). It often involves a player verbally abusing victims for their "poor" performance or "mistakes" (Lapolla, 2020). In the case of *Overwatch*, an example would be the tank player being verbally assaulted with offensive words such as "retard" or "noob" for not blocking damage for teammates.

A questionnaire survey was conducted for step 4 to collect information and thoughts about the flaming in *Overwatch* from the Overwatch community. The questionnaire design is based on the COM-B Self-Evaluation Questionnaire in *The behavior change wheel: a guide to designing interventions* (Michie et al., 2014).

There are several limitations to the case study, however: steps 2 and 3 of stage 1 were skipped because of the initial lack of a detailed understanding of the process. The interaction between stage 2 and stage 3 went linearly rather than circularly because the case study was conducted without the input of the development team on evaluating the preliminary in-game implementations.

4.1 Defining flaming in Overwatch in behavioral terms

In step 1, we define the flaming problem in behavioral terms, breaking it down to what the behavior is, where it occurs and who is involved in performing the behavior. The results are shown in Table 4.1. As to the "where does the behavior occur" section, this study made no distinction between the "Quick Play" mode and the "Competitive Mode", the two most popular modes in *Overwatch*.

What behaviour?	**Flaming Behavior in Overwatch**
Where does the behavior occur?	**Quick Play Mode and Competitive Play Mode**
Who is involved in performing the behavior?	**Overwatch Players**

Table 4.1. Flaming behavior defined in behavioral terms (modified from the table in The behavior change wheel: a guide to designing interventions (Michie et al., 2014, p. 34)).

4.2 Analyzing flaming in Overwatch: the survey and the COM-B model

Step 4 examines the target behavior with the COM-B model using the quantitative and qualitative data from the questionnaire survey. The questionnaire was posted on the r/Overwatch subreddit and the official *Overwatch* discord for r/Overwatch with questions regarding capabilities, opportunities, and motivations of flaming in *Overwatch*. It also has a final open-ended question collecting qualitative data on the general thoughts about flaming in *Overwatch*. A total of 229 responses were collected from both communities, 205 from r/Overwatch and 24 from the discord server. The questionnaire made use of several questions (See Appendix A) to exclude low-quality responses such as from those who either have not experienced flaming in *Overwatch* at all or even may not have played *Overwatch* before. 221 responses were counted after the exclusion. 63 effective qualitative answers were collected from 221 responses. The questionnaire also provides questions to investigate what needs to change to reduce flaming in *Overwatch* from both perpetrators' and victims' points of view. 64 of 221 respondents have experienced flaming in *Overwatch* as perpetrators while 189 of 221 have been victims. The respondent can choose multiple answers when asked about their position in the past flaming experience, thus the number can add up to more than 221.

4.2.1 Two themes from qualitative data: Why Flaming and Solutions

The coding process starts with looking at the 63 answers to the open-ended question (See Appendix A) in the questionnaire collected from 221 responses and identifying theme-carrying segments. Two high-level themes came out of this process: "WhyFlaming" and "Solutions". Each segment carrying the high-level themes was then investigated further and multiple low-level themes were identified such as "Team-dependent Game Design" or "Merit System", shown as the smallest buttons in Figure 4.1 and Figure 4.2. After identifying all the low-level themes, we categorized all of them into two mid-level themes: "Systemic" and "Agential", based on their inclination towards either the game rules system or the player base. The coding process was then completed with two hierarchies of themes as shown in Figure 4.1 and Figure 4.2.

In the "Why Flaming" theme (see Fig. 4.1), the majority express that the flaming issue comes from the player base, especially coming from the perpetrator blaming the teammates for their performance when the team is losing. As one respondent puts it:

> ""Flaming also often seems to happen when the team is doing poorly overall, and someone wants to be able to pass it off onto the actions of a single player, rather take responsibility for how their own play might be negatively affecting team performance. Overwatch players like toseem to think that poor team performance has a single identifiable source, when usually it is more of an aggregation of little things that multiple people do".

Negative mental status/attitude is also strongly reflected in the data: many respondents suggest that lots of players are either already having a bad mood when getting into the game or getting stressed out by a losing streak, which makes them easy to go off on other players.

In the systemic category of the "Why Flaming" theme, team-dependent game design is considered by many to be the root of flaming. Overwatch, with its asymmetric character design, relies heavily on the team effort that as one respondent says "It would take a core redesign

of the game to focus more on the single-player agency to truly fix this issue." Many also feel that the flamers do not get punished or punished enough as the "Ineffective Punishment System" is the second major theme. The merit system design, especially the medal system in the game is also believed to lead to many flaming. The medal system (see Fig. 4.3) in Overwatch is a way of showing a player's performance in-game by giving gold, silver, or bronze medals to a player according to their performance. The medals are the perceived performance of a player in a team and could breed flaming for that when a player is given gold they would be put onto the high ground of merit, making them feel more justified to blame other teammates for the poor team performance.

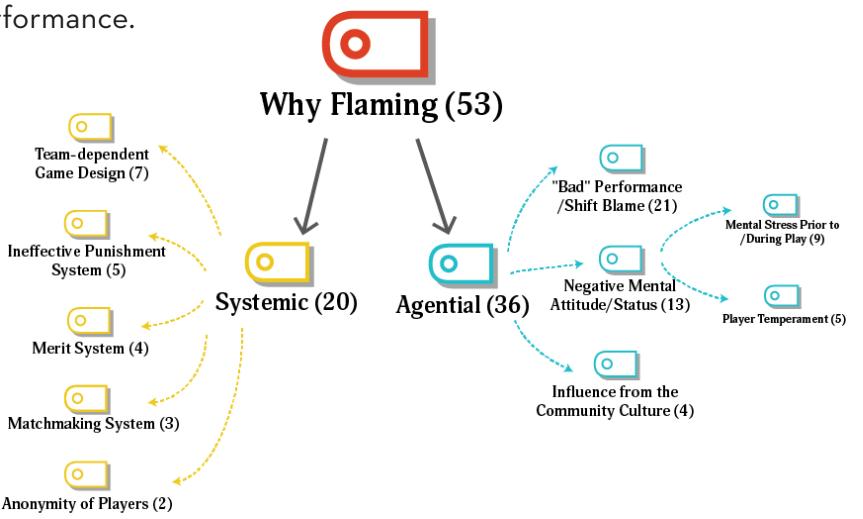


Figure 4.1. "Why Flaming" theme. The number shows the number of segments coded. A segment can have multiple codes thus the numbers may not add up.

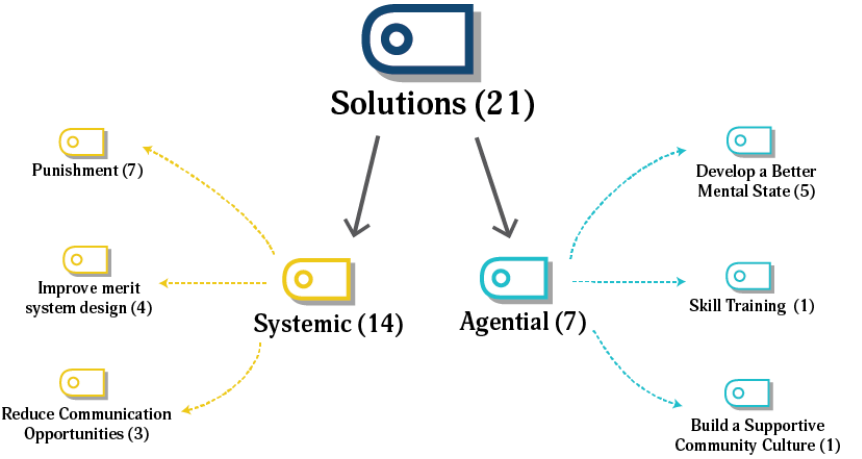


Figure 4.2. "How to solve flaming" theme. The number shows the number of segments coded. A segment can have multiple codes thus the numbers may not add up.

The suggested solutions (see Fig. 4.2) from the respondents centers on changing the rules system, specifically more harsh punishment to flaming. Others also suggest improving the merit system in various ways. This study, however, mainly takes insights from the feedback on why flaming happens instead of how to solve it as the solution are arrived at through the proposed GBCW and the intervention design process.

Figure 4.3. Medal system in Overwatch.

4.2.2 Quantitative data: Capabilities, Opportunities, and Motivations

The quantitative data shows the community's opinions on the capabilities, opportunities, and motivations for reducing/preventing flaming behavior. Regarding the capabilities, the perpetrator reports more interest in "have more mental strength" as well as "have more mental stamina", with 47 of 64 in the first and 43 of 64 in the second (See Fig. 4.4). The victims seem to favor "overcome mental obstacles" over "have more mental stamina" but the difference is minor and may come from the options provided not distinctive enough from each other"'. (See Fig. 4.4). In hindsight, the wording "have more mental strength", "have more mental stamina", and "overcome mental obstacles" did not provide enough nuances to be easily separated. The result thus should be interpreted as the respondents' inclination towards the examples provided in the options. The dominant pattern "Have more mental strength (develop stronger resilience against the urge to flame)" matches the sentiment from the qualitative data that the stressed-out mental status coming from factors such as "losing streaks" or just "having a bad day" could push people over the edge and flame others.

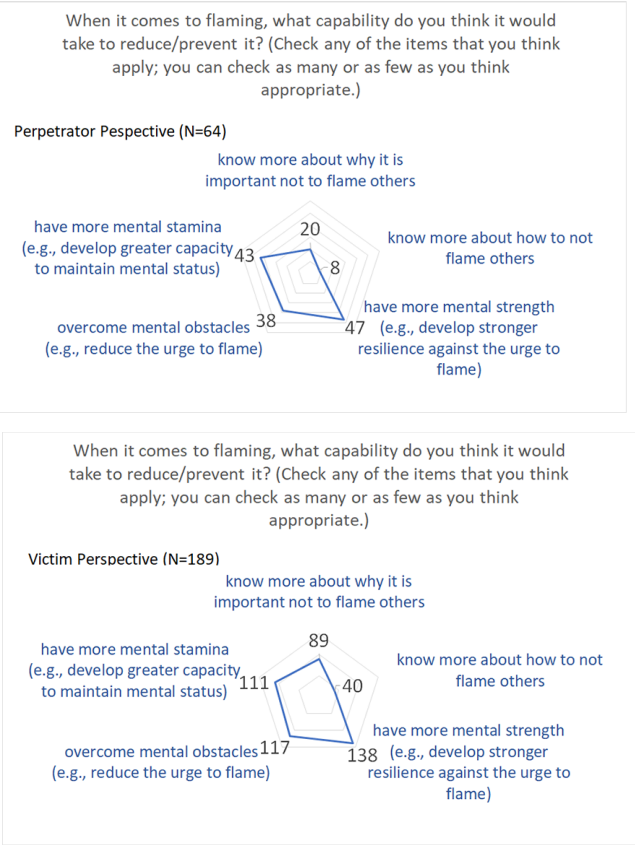


Figure 4.4. Capabilities from both perspectives.

As to the opportunities, a dominant trend shows up on both sides: "have more support from other players not to flame others" gains much more votes than any other options regardless of the perspectives (See Fig. 4.5). The qualitative data shows only limited insight with one segment describing that "Foster a culture of standing up for others, rather than a culture of dependence on an authority, i believe this is a primary driver for our weakness". However, it is still a revealing insight in that the more spontaneous solution of "have fewer in-game communication channels to flame others", which also shows up several times in the qualitative data, gets the least support from the qualitative data whereas "have more support from other players not to flame others", only mentioned once in the qualitative data, wins overwhelming support from the respondents. It shows the potential of the GBCW to explore buried insights that are harder to access via traditional methods such as the open-ended qualitative method.

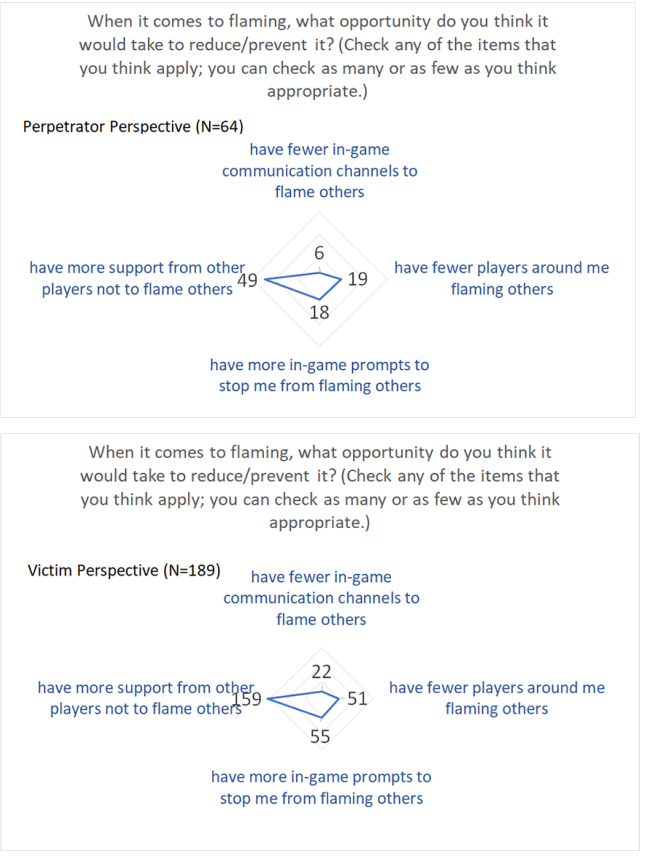
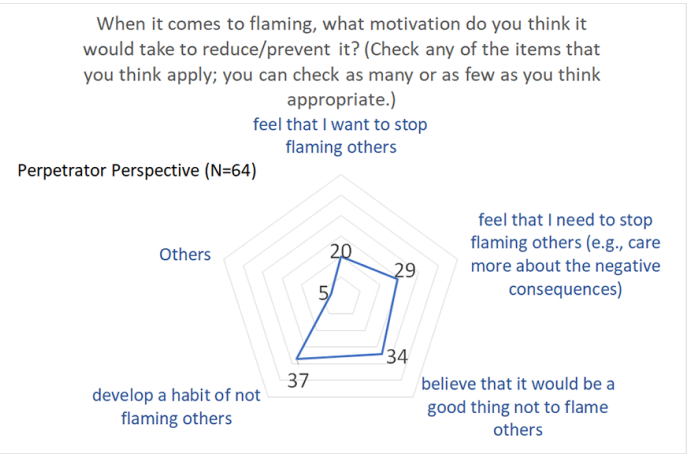


Figure 4.5. Opportunities from both perspectives.

When it comes to motivations, a difference between the two perspectives surfaces: the perpetrators gave the most votes to "develop a habit of not flaming others" (See Fig. 4.6) whereas the victim perspective suggests that the perpetrators need to realize that it is good not to flame others(See Fig. 4.6). The "'Bad' performance/Shift Blame" subtheme from the qualitative data also shows a contrast: the respondents who self-reported to have been the perpetrator tend to justify the flaming behavior as them simply pointing out their teammates' mistakes, which is exemplified by these answers: "In my experience I have only gotten flamed/seen others get flamed when they're playing poorly or do something stupid in game." or "When i flame people its because they refuse to fix their playong after the whole match of telling them how to win and they keep feeding." The victims share the exact opposite view, feeling that the flaming is completely unjustified and is just used to shift blame to others instead of reflecting your own fault. As several respon-

dents said, “part of the reason people flame each other, usually when on the losing side, is due to the ‘it’s my team’s fault’.” or “the average player who flames often see poor performance solely as the fault of others, and can’t acknowledge that it may be due to their actions, nor forgive their teammates their own mistakes.” Drawing insights from the qualitative data, an explanation for the preference difference in the quantitative data could be that despite being aware of their habitual flaming behavior, the perpetrators deep down inside believe that their flaming is valid, which may also explain why it has developed into habitual behavior in the first place. On the other hand, the victims hope that the perpetrator can be more self-reflective of their own mistakes instead of inflicting unwarranted flames on others.



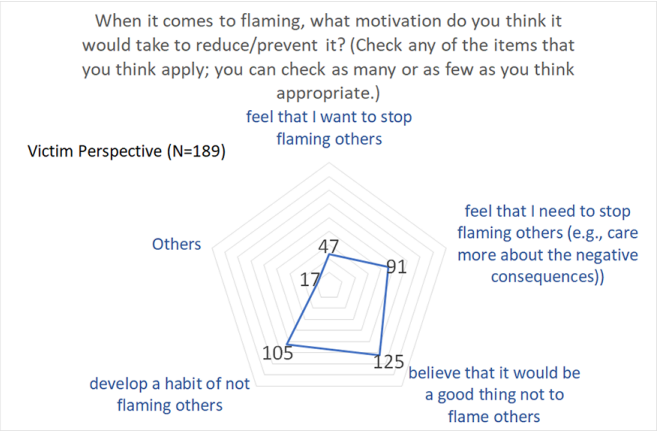


Figure 4.6. Motivations from both perspectives.

Putting together the analysis of all three components, we have a list of the components that need to change to reduce and prevent the flaming behavior in Overwatch (See Table 4.2). "Have more mental strength" is picked for the psychological capability because it is the primary opinion for both the victims and the perpetrators. The different views from both sides on the motivations will also be addressed. Having identified the components to change, we are going to the next phase of picking out the intervention functions targeting these components and designing implementations to fulfill the intervention functions.

Task: Use the COM-B model to identify what needs to change in order to reduce flaming behavior in Overwatch	
COM-B Components	**What needs to change**
Psychological capability	Have more mental strength
Social opportunity	Have more support from other players not to flame others
Automatic motivation	Develop a habit of not flaming others
Reflective motivation	Believe it would be a good thing not to flame others
Behavioral diagnosis of the relevant COM-B components:	Psychological capability, social opportunity, automatic motivation and relfective motivation need to change in order to reduce flaming

Table 4.2. Identified COM-B components need to change (modified from the table in The behaviour change wheel: a guide to designing interventions (Michie et al., 2014, p. 74)).

5. Designing behavior interventions against flaming in Overwatch

From stage 1, we have identified that psychological capability, social opportunity, automatic motivation as well as reflective motivation need to

be addressed for the change. It is impractical to directly address the players' lack of mental strength through in-game measures, however. Therefore, we address the problem by re-constructing the mechanics opportunity to channel and contain players' negative emotions. 5.1 serves as the reference for which intervention functions can influence which COM-B components.

COM-B Components	Intervention Functions							
	Education	Training	Incentivisation	Coercvion	Persuasion	Restriction	Environmental restructring	Modelling
Psychological capability	■	■						
Mechanics opportunity						■	■	■
Social opportunity						■	■	■
Automatic motivation		■	■	■	■		■	■
Reflective motivation	■		■	■	■			

Table 5.1. Links between COM-B and intervention functions (modified from the matrix in The behaviour change wheel: a guide to designing interventions (Michie et al., 2011, p. 116)).

5.1 "Bad Day" mode

To tackle the problem of lacking mental strength, this study proposes a "Bad Day" mode that uses environmental restructuring to alter the mechanics opportunities of the potential perpetrators. Many have reported in the qualitative data that a losing streak or just having a bad day could easily set off the player. However, it is undesirable and intrusive to conduct a psychological evaluation on the players before they start a game. Thus, a "Bad Day" mode could defuse the mental tension that when a player is on a losing streak of two or three matches, the system would suggest to the player whether they want to try some other modes that are more fun and exciting. The new mode could be one with a much less competitive player pool that prefers relaxing fun or a free-for-all mode where no team effort is required. However, no hint of any information that the new mode is less competitive or

requires less skill should be suggested; otherwise, it could easily come across as being judgmental on the player's skill, only aggravating the situation. Preferably, there should be some in-game incentives such as cosmetic unlockables to attract the player to other modes.

5.2 A new quick chat wheel

For designing in-game implementations capable of increasing the social opportunity of community support, we propose a new quick chat wheel that reconstructs the common quick messages in the game. The quick chat wheel in Overwatch gathers the most common messages players use such as "THANKS" and "HELLO" with the most frequently used ones such as "ACKNOWLEDGE" and "NEED HEALING/BUFF" having dedicated shortcuts. Being the central hub for the quick conversations between players, it is an ideal place to put in some new message into the common parlance. Thus the new quick chat wheel would include a message such as "Flaming ain't helping!" to encourage the community to step in when flaming is happening. To further lower the barrier for providing support, the message could have a dedicated keyboard shortcut. The players also need to be informed of the new chat wheel design by system message or other ways of in-game public announcement.

Figure 5.1. Quick Chat Wheel in Overwatch.

5.3 New merit system

Addressing the automatic motivation of developing a habit of not flaming others would benefit from digging deep into the possible root of the habitual flaming, which can be traced back to the belief of the perpetrator that the flaming, despite inappropriate, is nevertheless justified. The justification usually comes from the merit system in the game, i.e., if I am performing "better" than you in the game, I am in a position to judge you. The medal system (see Fig. 5.2) is one such system in the game that judges each player's merit by giving them different medals, which is seen by several respondents as the root of flaming. To address this, a new merit system (see Fig. 5.2) is designed to avoid competition and judgments between players. Rather than pitting players against each other for the medals, the new merit system compares the player's performance with the average performance of themselves on the same map with the same character. Because of the asymmetric character design of Overwatch, it also only shows the performance numbers that are relevant and meaningful to the character the player is playing, further removing the possibility of comparison stats while highlighting important information at the same time. Not only does it remove the comparison of merit among players, stripping away the justification upon which the habitual flaming is built, but the player is still able to keep track of their performance and have a sense of growth.

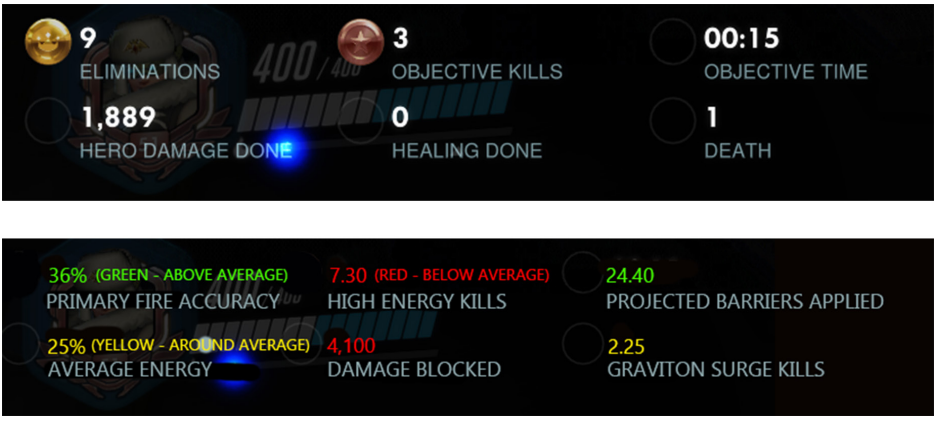


Figure 5.2. The existing medal system in the game (Above).
The new merit system in the game (Below).

5.4 Educational clips on the waiting screen

To have players be more aware of the fact that flaming others is not a good thing, the study uses an educational method to address reflective motivation. In Overwatch, there is a short time window before each match starts when the system is busy matchmaking in the background and nothing meaningful to the players happens. The current solution from the developers to address this downtime is to give the players the option to try other "light" game modes or practice in the firing range (see Fig. 5.3). However, this downtime is also a great chance for priming players not to flame for the upcoming match. A short clip of fewer than 30 seconds could be played explaining the negative emotional impacts of flaming on other players and also how unconstructive at all their flaming-in-disguise opinions are, another shared sentiment from the qualitative data.

Figure 5.3. The waiting screen before the match starts.

5.5 The AAN evaluation

The interaction between picking out intervention functions and designing implementations should ideally be conducted in a back-and-forth manner with the input from the development team on the AAN evaluation. Lacking the developers' judgment, however, the interaction was instead carried out linearly with the evaluation from the author listed in Table 5.2. The affordability is further split into the cost from the design team, the programming team, and the art team. The majority

of the implementations are agential by reforming or restructuring the player base, which usually causes much fewer negative effects. The new merits system, on the other hand, could be more likely to cause systemic and unpredictable effects in the game as it fundamentally transforms the scoring system.

AAN Criteria	Intervention Designs			
	"Bad Day" Mode	New Quick Chat Wheel	New Merit System	Educational Clips on the Wating Screen
Affordability	Design: medium Programming: heavy Art: light	Design: light Programming: light Art: light	Design: heavy Programming: heavy Art: medium	Deisgn: medium Programming: light Art: heavy
Acceptability	The delivery of the "Bad Day" mode needs extra care to not come off as judgemental for wide acceptance	The new anti-flaming message in the chat wheel is delivered passively. Thus a wide acceptance is expected	A merit system of only comparing with personal performance would expect resistance from a competiteveplayer base	The information is delivered actively during the waiting time. A wide acceptance is expected
Negative Impacts	Depending on the exisiting scale of the player pool, directing players into the new mode might split up the player pool, causing longer waiting time on common modes	Possbile spamming of the new message	A possible huge debate on the new merit system in the community would happen. Could be damaging to the game if not handled with care	Depending on the clip time and the waiting time, the priority has to be decided which may either reduce the effectiveness of the clip or increase the waiting time

Table 5.2. AAN Criteria evaluation.

6. Discussion

The case study on Overwatch demonstrated the guiding power of the Game Behavior Change Wheel throughout the entire intervention design process: from the COM- B model framing the nuances of the target behavior all the way to the intervention functions pointing out the direction of implementation designs. Consequently, the resulting implementations are not only much more diversified than the common existing anti-toxicity measures but are grounded in the evidence provided by the survey, reflecting and addressing the sentiment from the community. There are nevertheless several drawbacks to the case study on Overwatch, from which future applications of the GBCW could take heed. With toxicity occurring in a larger cultural context, tackling toxicity in games has more to explore than having a powerful intervention design framework.

6.1 The case study limitations

The neglected step 2 of select target behavior should be carried out with the stakeholders such as players from the community brought into the discussion. The selection should ideally end with a list of behaviors that are relevant to flaming, organized in a system of behaviors as in Figure 6.1.

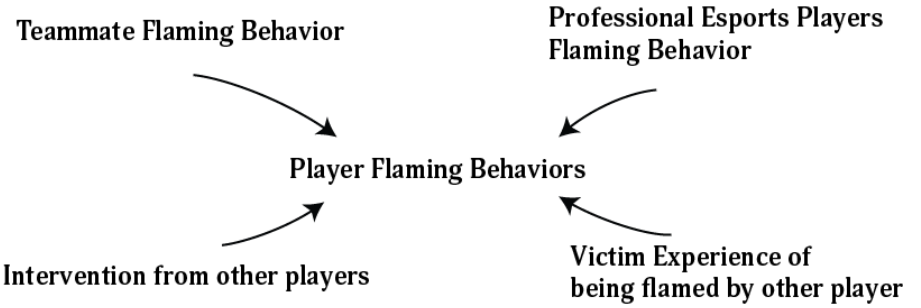


Figure 6.1. Flaming relevant behaviors in a system.

The behaviors in the system could all influence the flaming behavior and thus should go through an evaluation process to determine which single or which set of behaviors should be targeted. A set of helpful criteria proposed by Michie et al. (2014, p. 41-24) is examining "the likely impact if the behavior were to changed", "how easy it is likely to be to change the behavior", "the centrality of the behavior in the system of behaviors", "ease of measurement."

Step 3 of specifying the target behavior should also dig down at least to which game mode the flaming behavior is happening and whether it is in the same team or between opposing teams. This study sees the quick play mode and the competitive play mode as a whole, which are bound to be different for their different intensity of competitiveness. The flaming happening in the same team could also have a different reason and frequency than flaming between two opposing teams.

Lastly, some questions in the survey do not have distinct enough answer choices. An open-ended question following each close-ended question could also bring insights into the answers with the downside of bringing down the response rate by too many open-ended questions.

6.2 Toxicity, meritocracy, and the Game Behavior Change Wheel

As Paul (2018) argues in *The Toxic Meritocracy of Video Games Why Gaming Culture Is the Worst*, modern multiplayer games are deeply entrenched in meritocratic designs. Players' merit is constantly being judged by their scores, ranks, and medals. One of the major pitfalls of meritocracy, as Paul (2018) argues, is that it makes the people higher on the hierarchy grow insensitive to the structural inequality which sends them higher in the first place. They tend to believe that they earned all the rewards by their own merit and thus deserve everything they have. The sense of deserving also entails the sense of not deserving, giving people higher on the social ladder justification to judge people who are not performing well according to the established merit standard since it must be because they are not working hard enough that they end up lower. Taking place in this larger cultural context, the game community also inherited the issue as it is manifested in the case of *Overwatch* where the medal merit system is perceived to foster the judgemental flaming behavior. It then follows that to address the toxicity in games the game designers need to dial down the extent of meritocratic norms in games. Sadly, with the mass population indoctrinated by the idea of meritocracy, there is no sign that the profit-driven big names in the industry would push a new agenda at the risk of losing the massive player community. The Game Behavior Change Wheel certainly is not the silver bullet, but considering the complexity of tackling toxicity and how scarce efforts are being put into addressing the root cause, it could be one of the best tools currently available to fight toxicity.

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Chapter 11

A Taxonomy of Queer Game Design Experiences in MMO Games

Sandra Alexandersson

Abstract

Many studies have been conducted on the experience of play in MMO games to determine what makes them attractive to players. To deepen this understanding and to suggest a potential longitudinal study, literature has been reviewed to determine key factors of what makes MMOs attractive to queer players. Social play, character creation, gameplay, jobs/classes, tasks, gestures, queer representation and the possibilities of queer play as well aesthetic appearance was revealed to be important for queer players. These key factors were then applied to *Final Fantasy* XIV to determine if it differs from or adheres to the standard of MMO design.

Keywords: LGBTQ, queer communities, Final Fantasy XIV, MMO, online communities

1. Introduction

That games have the power to connect people isn't a mystery. Enjoying games, be it from the seat of an arena, on your kitchen table or in your gaming chair, allows individuals to reach out to others. Massively Multiplayer Online games are no different, and might even be unique in the communities they form. Here players engage in various amounts of gameplay, which can be categorized under achievement play, social

play and immersive play (Yee, 2006a). It is no wonder that this diverse environment attracts a large number of players. Yet, what draws queer players to establish communities in MMOs, with a play environment known for its heteronormative design and sometimes homophobic communities?

Through an extensive literature review, the play and connection happening through the MMO genre will be explored and a taxonomy of queer player experiences in MMOs will be developed. MMO games seem to open up a potential of queer play through its use of avatars, classes that allow subversion of norms regarding gender, gestures that opens up the potential of queering the game world alongside other players, which has been made possible through the extensive potential of social play. It is also theorized that the design of the game world when it comes to color and environment might entice queer players to more likely enjoy their experience there.

The developed taxonomy, based on these findings, will then be applied to *Final Fantasy XIV* (2013). *Final Fantasy XIV* experiences high activity to this day, and is known for its friendly community it is therefore potentially useful in providing a perspective on queer communities through a future longitudinal study in an attempt to further the understanding of queer play in seemingly heteronormative spaces.

2. Background

An extensive background will be presented here, exploring the various concepts that have given rise to the popularity of queer communities in MMOs, in an attempt to discern what draws these players to the genre. A lot of existing research is focused on *World of Warcraft (WoW)* (2004), and an attempt will be made to update the existing literature based on these studies by applying it to a more recent MMO game. The information derived from the background will then be used to develop a novel taxonomy, which is applied to *Final Fantasy XIV,* in an attempt to analyze the game and its community to determine if it has transcended the limitations of its predecessors and whether it would be appropriate to conduct a more extensive study amongst its player base.

2.1 What are MMOs?

MMOs, or MMORPGs, are highly social games primarily designed for computer play, prompting players to interact with other players to perform tasks in the fictional game world, opening up the possibility of various kinds of role-play (Martončik and Lokša, 2016; Sihvonen and Stenros, 2018). Shao-Kang Lo, Chih Chien Wang and Wenchang Fang define online games as an information technology application in which the player can anonymously create virtual communities and assume any role they desire. These games are further characterized by media richness, real time interaction and a lack of boundaries where players experience multimedia presentations with other players (2005). The number of players on these platforms have risen, making MMORPGs one of the most popular forms of gaming in which hundreds of thousands interact socially in the game world (MacCallum-Stewart, 2008; Ducheneaut and Moore; 2004). Games like *World of Warcraft, Final Fantasy XIV, Black Desert Online* (2015), T*he Elder Scrolls Online* (2014), *RuneScape* (2001), *Guild Wars 2* (2012) and *Star Wars: The Old Republic* (2011) currently amass more than 10 million players each. MMORPGs allow the players to explore many modes of play, like interacting in a guild, playing with strangers, facing off against enemies, joining teams or interacting with message boards, making friends, or conducting transactions, meaning the gameplay experience is highly social (Taylor, 2003; Lo et al, 2005).

MMOs can be compared to more traditional table-top or live-action role-playing games and multi-user domains, which are seen as the textual predecessors of the digital MMORPG and are more closely related to the genre than stand-alone games and games tied to a local network (Yee, 2006b). This connection to earlier RPG games can be seen in Michael Hitchens and Anders Drachen's paper regarding RPG games. They describe how role-playing games give the players access to a large section of a game world that gives the players extensive choice on how to explore said space, giving them the ability to choose their own path through the game while following a strong narrative (2008).

This can be regarded to be the play experience of discovering the vast MMO world, traveling, visiting locations and making choices on how to conduct your gameplay. For a game to be an RPG, according to Hitchens and Drachen, six criteria need to be met: 1) there needs to be a

game world, 2) there needs to be participants in that world, 3) characters, 4) interactivity, 5) narrative and 6) a game master (2008). Hitchens and Drachen note that digital games blur or even remove the barrier between player and game master, proving that digital games do not conform to the full criteria of role-playing games, but that the digital games tend to offer a range of other possibilities like combat, dialogue and object interaction (Hitchens and Drachen, 2008). However, since software is less flexible than paper and pencil, digital games are more restrictive in terms of how to present characters and events (Hitchens and Drachen, 2008).

Role-playing games primarily focus on the idea that the participating players engage in the world and create imaginary events in a fictional universe through the use of anthropomorphic characters (Sihvonen and Stenros, 2018). These characters can be seen as a key tool in how the players interact with the world and how they experience themselves within the digital game sphere.

2.2 Avatars

The characters are integral to RPG games, especially the player character, since it is through this avatar the players mainly interact with the game world, as this is the aspect of the game they have the most control over (Sihvonen and Stenros, 2018; Hitchens and Drachen, 2008). These characters can be the core of gameplay for some players, as is the case in tabletop RPG tradition, while others merely use their character as a tool through its mechanical and functional attributes and abilities (Sihvonen and Stenros, 2018; Williams, 2011). Avatars are the central tool through which players immerse themselves in the game world and construct themselves in a virtual space; a link between player identity, social life and the magic circle of the game (Taylor, 2003; Pulos, 2013). The appearance of one's character, its clothes, physique, hair, face and gestures has been proven to be as important as the virtual world in allowing players to perceive themselves through their characters (Bloustien and Wood, 2013).

RPG games, and in turn MMOs, tend to provide players with a range of identities and abilities to be explored through their character (Griffiths, Davies and Chappell, 2004). Already in the avatars creation it can be observed how the construction of sexuality and gender is linked

(Eklund, 2011), making avatars perfect vehicles for players to explore identity, and the design of MMORPGs offer the players some unique opportunities to do this (Taylor, 2003). The power of the avatar comes not only from the construct of role-playing, but also from its role as interface between the player's experience themselves, others, and the world of the game (Taylor, 2003).

A core activity of online gaming is deciding on the player characters appearance, for example through questing with other players and facing off against difficult gameplay events to win desirable gear for one's character, or manipulating a character creation interface (MacCallum-Stewart, 2008). Creating the character is usually done by choosing between prefixed attributes, usually aligned with heteronormative gender values, which renders the characters clothes an important feature in how the players present themselves in the game (Sihvonen and Stenros, 2018). It is clear that the avatar and its appearance can help players explore identity and even become a therapeutic experience for minority groups, something which has been explored in previous research (Morgan et al, 2020; Griffiths, Arcelus and Bouman, 2019).

Nic Crowe and Mike Watts describe the avatar as an integrated link with the player in which the interface between material and virtual concerns can be explored (2012). The players connection with their character is however not only developed through appearance and gear, but also in how the character acts. A character can protect someone or stand up against abuse, prompting players to be both proud of and concerned over their character (Pulos, 2013). The avatar can be seen as a tool to explore identity, fight against abuse and as something the players can care about. Through its many uses, avatars are crucial for the virtual experience of young people (Crowe and Watts, 2012) and can become a persona with an inner life for the player (Sihvonen and Stenros, 2018).

2.3 Escapism and Identity in MMOs

Virtual games may grant players the opportunity to express themselves and explore identities which they might not explore in other contexts, due to their gender, sexuality, appearance or age (Cole and Griffiths; 2007). Games can act as a tool for young people to feel represented in an idealized way by being granted the ability to make those choices

for themselves (Crowe and Watts, 2012). MMOs can become a testing ground for trying on new roles and identities and also give players a space to work through personal issues (Pulos, 2013).

Games can be used as a space where a player can explore taboo behavior, allowing them to be terribly violent or behave badly, or by refusing to adhere to the existing gender norms and instead try on different gender identities, like playing a character of another gender (Humphreys and de Zwarts, 2012). Through the game, a player is allowed to embody alternative beings (MacCallum-Stewart, 2008). Since the MMO form is characterized by anonymity, the potential cost of trying on different roles and exploring non-normative identities is a lot lower than in other contexts (Williams, 2011).

Individuals from marginalized groups might seek out games as relatively safe spaces, either to explore their identities or find a place where they might be themselves without facing rejection in other contexts (Williams, 2011; Cole and Griffiths, 2007). Since MMOs offer a large variety of game styles, ranging from demanding raids, acquiring desirable gear, participating in crafting jobs, gathering materials and designing homes, it is clear it can attract many players. Through various play styles, MMOs can become a space to experience self-expression where players can explore both themselves and relationships in a new world (Krotoski, 2004). The game can become a space for identity performance through corresponding play (Taylor, 2003), in which role-play can be used to express suppressed identities rather than creating new ones (Williams, 2011).

2.4 Social Interactivity in MMOs

MMORPGs are focused on creating social interaction between the players, sometimes with an intensity that promotes the idea that a large portion of the players' social life should occur within the chosen game world (Sihvonen and Stenros, 2018). This experience of social play creates a complex virtual environment where players can interact with others on a daily basis and move conversations beyond the game and start talking about personal issues, making participation in the game go beyond just gaming (Pulos, 2013; Yee,2006b). Players get the ability to create personas and communicate with others, something similar that

can be observed in other online social sites, since online games have incorporated most characteristics of Internet communication (Pulos, 2013; Lo et al, 2005). Due to these features being present in online games, they have a high chance to attract individuals who use the Internet for social interactions (Lo, Wang and Fang, 2005).

The MMORPG becomes a social space where players might log in to participate in socializing as much as they play the game itself (Humphreys and de Swarts, 2012). Role-playing in the game world can become a therapeutic activity removed from the player's daily life (Williams, 2011). Forming strong emotional ties, ranging from friendship to romance, with other players is common, as is community building (Cole and Griffiths, 2007; Krotoski, 2004; Martončik and Lokša; 2016; Pulos, 2013; Yee, 2006b; Williams, Ducheneaut, Xiong, 2006). When it comes to these relationships, they are likely similar to relationships in other contexts, since players find friends and groups in a similar way in the virtual sphere (Ducheneaut and Moore, 2004). Players also use MMOs to maintain relationships with friends from other contexts (Williams et al, 2006; Griffiths, Davies and Chappell, 2004).

Notably, MMOs and online communities in general, have been proven to be safe spaces for people suffering from loneliness and social anxiety (Martončik and Lokša, 2016; Morahan-Martin and Schumacher, 2003; Leuing, 2011). Individuals suffering from a high level of social anxiety transfer their social interactions to the virtual world where they can form strong friendships that can carry over to in-person contexts. This is also applicable for lonely people, who unable to find a satisfying communities in person, might instead turn to the virtual world of the MMO and find a community there (Martončik and Lokša, 2016). Players might seek out these online games in search of a community that they feel might be missing in their lives (Williams et al, 2006). Morahan-Martin and Schumacher theorize that the lack of face-to-face communication might be positive for individuals suffering from social anxiety, since it can encourage pro-social behavior due to their self-consciousness decreasing (2003).

The same can be theorized for lonely people, since communicating online allows them to control the social situations by remaining anonymous, lurking or not being forced to have a physical presence (Mora-

han-Martin and Schumacher, 2003). The space also allows them to try out new identities, which might ease their loneliness by living in a fluid virtual world that can enhance experiences they can't experience in the real world (Leuing, 2011). Leuing concludes that the experimentation with online identity in this way is a key contributor to why some individuals prefer online social interaction, which indicates that individuals who have fun with this fluid experience of identity tend to prefer the online social world overall (2011).

However, this online environment might not be all positive, but rather provide only temporary relief. Lo et al. note that while online games give a brief sense of satisfaction, they can also create a situation in which the user relies too heavily on online social relationships and ends up letting go of in-person friendships, in turn increasing their social anxiety and making these individuals turn even more to the online world (2005). Other researchers mention the danger of MMO players developing addiction, something Cole and Griffiths bring up as well (Lo, et. Al. 2005; Cole and Griffiths, 2007).

One way MMO players connect with one another is through the ability to create guilds in the game, communities that bring players together. This gives players a chance to form friendships and find a safe space for social interaction.

Guilds are central to how social bonds and communities can be formed in MMO games. Guilds are social organizations that allow players to stay in touch and interact as a group, in which members can help each other progress through the game and function as a social community which can broaden the play experience (Pulos, 2013). Guilds can also function to create individual factions and teams based on shared beliefs and preferences, becoming something of a virtual organization in which players can join each other through a common cause (Lo, Wang and Fang, 2005).

It is clear that the social interactivity in MMO games engages players in various ways. Players get the ability to create personas, engage in social communities, build friendships and enter a context in which they can help and be helped by other players. People suffering from loneliness or anxiety might find the social communities in MMOs comforting and MMOs can also be used to maintain friendships made in other

contexts. The ability to connect with others can be seen as a core mechanic that makes players engage with MMO games for a long period of time, and the people encountered in MMO games can help create a safe space for players.

2.5 Queer Communities in MMOs

Through virtual worlds, marginalized and oppressed groups can find a safe place to conduct social movements where LGBTQ players stand up for their rights through activism. Through these safe spaces in virtual worlds, oppressed people can find a place to develop coping skills and explore their identity (McKenna and Chugtai, 2020). Pulos states: "Many LGBTQ players are attracted to MMO games because they offer a place to socialize, to form new networks and experiences, and to enact nonheteronormative roles (2013, p. 81)." This is comparable to the trend in which marginalized groups seek out virtual communities online to find people that struggle with the same concerns as themselves. In a virtual group, in which a person can find the security of anonymity and have their identity hidden from face-to-face interaction, they can more safely admit to their marginalized identity. Through an Internet group a stigmatized individual might find others with the same stigmatized identity sharing posts or experiences that might resonate with their own life, which can strengthen their own identity and belief in themselves (McKenna and Bargh, 1998).

Guilds in MMOs can mimic these social virtual spheres. A famous legal case regarding an LGBTQ guild arose in 2006, when LGBTQ activist Sara Andrews attempted to create an LGBTQ-friendly guild in *WoW*, which she advertised through the in-game chat, which was common at the time (Pulos 2013; Humphreys and de Zwarts, 2012; McKenna and Chugtai, 2020). The case gathered traction due to the fact that Blizzard, the developer of the game, did not allow the creation of the LGBTQ guild, because they saw it as a form of discrimination since it could incite harassment towards guild members and therefore breached the game's terms of service (McKenna and Chugtai, 2020; Pulos, 2013; Humphreys and de Zwarts, 2012). Eventually, Blizzard apologized and reversed their decision regarding the guild (Humphreys and de Zwarts, 2012). Since then, LGBTQ-friendly guilds have blossomed in the virtual worlds of MMO games. Members of LGBTQ guilds have expressed that the primary motivation for engaging in these communities is that

they create a sense of belonging despite of the larger heteronormative environment in the game world (McKenna and Chugtai, 2020). It is therefore no surprise that LGBTQ guilds garner a lot of members and have risen to prominence.

One such notable guild is, once again, located in *WoW*. Named LGBT, it started from humble beginnings to eventually become one of the largest guilds in the game, with the goal to provide safe harbor, friendship and fun social experiences for their members (McKenna and Chugtai, 2020). They hold regular events inside the game, like pride parades, dance parties and guild photographs, and in 2012 fifteen thousand characters were part of the guild (McKenna and Chugtai, 2020). Through these events, players of opposing in-game factions (Horde vs. Alliance) come together and set aside their in-game differences with the common cause to celebrate pride and promote gay rights, and eventually the pride parade garnered so much traction that the server the LGBT guild was hosted on became known as a gay-friendly server (McKenna and Chugtai, 2020). These guilds have managed to provide a safe space for players to interact with other players, where one can find a place in the game and connect with trustworthy individuals (Pulos, 2013). Many members of the LGBT guild come from rural areas and are unable to celebrate pride and participate in other LGBT-friendly events in their physical location, making the pride events held in *WoW* the only ones they can attend, while others hail from countries or states where homosexuality is criminalized (McKenna and Chugtai, 2020). This can be seen as a critical example of how marginalized and oppressed communities find ways to resist existing power structures (McKenna and Chugtai, 2020).

Online communities can support LGBT individuals in their understanding of their own identities, where they can voice their feelings online before taking the step into the offline world. This is particularly common for younger members of the LGBTQ community (Baams, Jonas, Utz, Bos and van der Vuurst, 2011). It is clear that for the LGBTQ community, interplay between the virtual world and the physical world exists (McKenna and Chugtai, 2020). This is important, since it can inform researchers on how to understand marginalized groups as they voice their concerns through contemporary digital worlds and technologies (McKenna and Chugtai, 2020).

2.6 Homophobia in MMOs

As positive as the LGBT guild has become for its members, the inclusion of more openly LGBT players in MMOs hasn't always been met with praise and positive attitudes. When the server that hosted the LGBT guild in *WoW* started becoming known as a gay-friendly server, other players created characters on the server specifically to grief, harass and bully these LGBT members through spamming the chat channels to the point where LGBT had to move its invite channel to a personal website (McKenna and Chugtai, 2020). *WoW* suffers from a constant use of degrading language in the general chats in the game, where players spout homophobic remarks like "fags suck" or "die homo die," which is then spread through chat lines (Pulos, 2013). Just as homophobic language is common, so too is sexualized language, with degrading language commonly perpetuated by male players (Nardi, 2010). If displeased with another player, they would be called degrading words like fag, faggot and homo, as well as gay, which is liberally used in communication between players (Nardi, 2010). While racial slurs appear more rarely, they are also widely reported, while homophobic language is mostly ignored. Through this lack of moderation and care, the chat constantly updated with demeaning remarks towards LGBTQ minorities (Nardi, 2010). While virtual worlds can provide safety for marginalized groups, these worlds are also gendered political and social environments that can be used for oppression (McKenna and Chugtai, 2020). Digital identity is not a liberated space, but rather a space that incorporates and mirrors the ideals and norms of the material world (Crowe and Watts, 2012).

The resistance to LGBT gamers in *WoW* did not only take place in the game, but on its forums as well, which can be easily accessed by all players (Pulos, 2013). A thread was opened in 2009, as an open forum to discuss people's issues with LGBTQ *WoW* players, as well as a space for LGBTQ players to share their negative experiences (Pulos, 2013). It was eventually locked, but garnered a lot of responses before closing. Several messages claimed that sexuality did not belong in *WoW* and that player sexuality has nothing to do with playing the game, and several posters expressed that they did not want issues, like LGBTQ rights, brought up in the community. Degrading language was also encouraged as a part of gameplay. LGBTQ players and guilds were ac-

cused of inviting harassment: if they would shut up, they wouldn't suffer from abuse (Pulos, 2013). Pulos states that these remarks illustrate players' inability to recognize the oppression of the LGBTQ community, and demonstrate these players assuming an ideological authority over marginalized players, as well as indicating their perception that LGBTQ individuals need to play by set hegemonic rules (2013). LGBTQ friendly guilds were ridiculed as a place to have hardcore gay cybersex instead of clearing desirable game challenges (Pulos, 2013).

Similar forum discussions, also exploding in 2009, could be observed on forums dedicated to the Bioware game *Star Wars: The Old Republic* (SW:TOR). On these forums, similarly, discussion arose as to whether sexual politics should be discussed in a game, after it was brought to players' attention that Bioware had censored LGBTQ words like "gay" and "lesbian" in the message boards (Condis, 2014). While the support of this censorship tended to be framed as a desire to avoid having political and ideological conflict infiltrate the game space, it instead revealed the desire to maintain the heterocentric power structure of the game: if Bioware starts catering to these queer players they would do a disservice to their "real" fans, because real fans would never disturb the game with these concerns (Condis, 2014). Arguments were made that Bioware should uphold the barrier between the real world and the game world, since the game should merely be focused on play and was used as a way to shield players from real world issues (Condis, 2014). Through gaming, a heteronormative utopia could be reached. The virtual world could be shielded from real world corruption and become an apolitical space freed from real world constraints, and any queerness added to the game would be a rude subversion of this utopic, "normative" paradise (Condis, 2014).

While homophobic sentiments where common, queer players raised their voices as well. *WoW* was described as a community in which people could support one another instead of spouting degrading language, and since other players seemed to believe that sexuality, if queer, should not be part of *WoW*, several queer players expressed the need for LGBT guilds (Pulos, 2013). Queer players expressed the need for a supportive space when suffering from abuse and homophobia, making individuals feel isolated and lonely, and that the only way to fight intolerance is to be proud and claim space. Several users shared personal

stories about having friends that lost their lives due to intolerance, and fought back against the implications that minority identities are abnormal (Pulos, 2013). Queer players disagreed with Bioware's decision to censor words, calling out the irony of creating a game where one can develop their own identity and then thinking terms like "gay" and "lesbian" shouldn't exist in that world (Condis, 2014). Condis concludes that these "real gamers" scold women, queer people, racial minorities and disabled individuals for wanting to ruin the game by calling attention to themselves, which goes against the desire of the straight, white, able-bodied male gamer that should be the desired target group of the designers (2014). With that, the cry for an apolitical game space instead has huge political consequences within the community (Condis, 2014). The need for no politics in games is in fact inherently political, since to achieve this desire, all undesired voices would need to be silenced through design interventions and censorship implemented by game developers and players alike.

2.7 Heteronormative Design and Queer Play

Since *WoW* operates within the fantasy genre, it has the potential to subvert heteronormativity and avoid all associations with gender and sexuality to allow for queer play, but instead heteronormative and homophobic viewpoints of gender and sexuality exist in the game space (Pulos, 2013). It can be compared to the compulsory heterosexuality of *Mass Effect*, which Megans Blythe Adams remarks can only be avoided by not playing at all, although the heteronormativity can be resisted during gameplay (2015). This heterosexual matrix establishes the accepted norms in the game and in the player base, which limits how players can enact sexual expressions. While the game forces limits and restraints on its players through its lack of neutral spaces, freedom still exists. Since the potential of non-normative performances are controlled by norms outside the game world and deliberate design choices, the game can be opened up for queer play by subverting these norms (Eklund, 2011).

Queer play operates on the margins of intended play. Salter, Blodgett and Sullivan call it transgressive play, where the players shape their own experiences and challenge heteronormative narratives by how they operate in the game world (Salter, Blodgett and Sullivan, 2018).

Jenny Sundén makes a passionate call for queer play, where she recalls that even thought *WoW* operates within a heteronormative frame, she managed to queer gameplay by bonding with her playmate, and as the characters traveled together the game turned into something more than it was supposed to be (Sundén, 2015). Queer play happens when queer emotions and expressions, for example through bonding with playmates or using gestures to imply romance, queers the game into something the designers did not intend.

While the game space might discipline and coerce players into normative roles through the introduction of gameplay, there are ways to resist these established structures (Pulos, 2013), as noted by Salter, Blodgett and Sullivan (2018) and Sundén (2015). Pulos note that if digital environments like *WoW* can be taken seriously in regards to their queer potential, then digital games can be recognized as a space to foster commitment to equality and antisuffering, which can then be transferred out of the digital space (2013). MMO's power can be realized in their ability for LGBTQ communities to confront and disrupt structural powers that oppress them, rather than being a meeting place for hostile viewpoints (Pulos, 2013). Sihvonen and Stenros note that while numerous games might not welcome or display queer expressions, one can observe player cultures and find cracks in the surface of these games too (2018).

Many games might not openly support queer themes and when included they might provoke extreme reactions, but that doesn't exclude the potential for queer play. Instead, queerness refuses to be silenced and censored, surfacing to clash with both the product and service of games (Sihvonen and Stenros, 2018). LGBTQ characters might not exist in *WoW*, but players can still create them: male blood elves are often seen as more feminine and coded to be gay, while other players might roleplay that their avatar is a lesbian. Queer mechanics are not needed for players to create queer play (Sihvonen and Stenros, 2018).

For example, the queer readings of male blood elves in *WoW* can be viewed through the lens of encoding and decoding, developed by Stuart Hall. Hall explains that symbolic messages can be meaningfully de-coded and then take different forms through the neutralization of set meanings. Through this neutralization, new meanings can take form

and a transformative process can take place and repressed, 'disguised' forms of culture can appear. Through that process a much wider range of visual signifiers can be discerned (Hall, 1973). In the context of *WoW*, the male blood elves' symbolic meaning and the message they send out can be perceived differently by members of the LGBTQ community in order to subvert common readings of a message. In this regard, players might also enforce codes onto avatars and enable queer play.

One participant in Eklund's study decided to design her female avatar based on what appearance she would be drawn to in a lesbian partner (2011). Queer play might put a player in control of an avatar of a different gender, which was observed to be more common amongst homosexual players, while role-play was observed to be more common in marginalized groups with a higher level of psychosocial and health related problems (Sihvonen and Stenros, 2018; Eklund, 2011; Williams, 2011) All of these queer play potentials are possible in the space of MMO games. Sihvonen and Stenros mention that queer play can also be found in gameplay though things like items that reassign gender, through seduction mechanics, through adopting visual and behavioral cues that other queer players might recognize (2018). An avatar's clothes can be used as a signal to invite queer play experiences with other players through careful curation, and in the play between player and avatar queer situations might arise (Sihvonen and Stenros, 2018; Eklund, 2011). In the absence of designed queer play, queer players engage in transgression against the norm and establish queer communities, friendships and characters in an otherwise heteronormative environment. Even if the digital game environment becomes hostile, queer play can be moved to other sites and create more safe spaces for queer players, like websites or forums (Sihvonen and Stenros, 2018; McKenna and Chugtai, 2020; Pulos, 2013; Condis, 2014).

2.8 Appealing Game Design for Minorities

WoW has proven to be unusually popular amongst women, with 20% of players identifying female, according to Nardi (2010). She continues to theorize about what it is about *WoW*, the largest MMO to date, that attracts women in such numbers, which will be presented here due to the potential that the same attributes that attract women to MMOs might be applicable to LGBTQ minorities as well. *WoW* is attractive to

women players, despite its prevalence of offensive language and "boys' tree house" dynamic, as Nardi calls it (2010).

Nardi describes that one thing that struck her when playing *WoW* was the appearance of "[...] beautiful meadows colored emerald green and a particularly striking purple-violet," her favorite colors that made her feel as if they game was designed for her – she was home (2010, pp. 167). With the disclaimer that men might also like these colors, she describes them as feminine, in that they appear on female clothing and jewelry and rarely seem to be present in the world of men, and that the inclusion of these colors in the game made *WoW* seem nuanced and somewhat divergent from expressing stereotypical masculinist sensibilities (Nardi, 2010). Walking in the world of *WoW*, you can find yourself gazing upon beautiful night skies, see designers implement soft shapes and curves, walk into a snug inn or shop or walk in nature to the sound of running water and croaking frogs, all while colored in appealing, tertiary colors (Nardi, 2010).

Domesticity is common in *WoW*: you can have a home in the capital cities, acquire cute pets in the shape of baby elephants or piglets that Nardi describes as unthinkable in masculinist game design, and the game space is not riddled with terror and violence, which many women dislike (2010, pp. 167-168). Instead, you can take up a craft more focused on collecting materials, brewing potions, cooking, making bandages, fishing or farming; activities which characters of both genders engage in. Instead of being gendered activities associated with certain roles in other contexts, you could find players all over the world cooking or baking cakes with their masculine characters while female characters mine ore or smelt metal (Nardi, 2010, pp. 170-171). In *WoW*, these gender roles seemed to melt away as a diverse range of characters engaged in activities together, moving back and forth across gender boundaries in the virtual game space (Nardi, 2010, pp. 171). She describes that while male characters could pick flowers and create jewelry, female players had the power to be tough and engage in killing and "pwning." This ability to move across gender boundaries enables the ability to perform transgressive play, since the logic of the game encourages these activities to enhance performance (Nardi, 2010, pp. 173). Regardless if you play a female or male character each inherit the same power and game activities as gender-neutral performance activ-

ities focused on improvement (Nardi, 2010). With its seasonal events, with feminine graphics including wreaths, candles and flower garlands, *WoW* removed itself artistically from the masculinist design of moving across a concrete space. Through its domestic design, the ability to flirt in a safe place, raids and gender-neutral activities, *WoW* seems to have realized a space that combines both male and female elements into a game design that attracts women more than most games (Nardi, 2010).

Cole and Griffiths also found that *WoW* was significantly popular amongst women, and they attribute women's attraction to MMORPGs to the tendency for women to enjoy social communities that encourage playing as a team, as well as the ability to try on identities in a safe space and the visual appearance of the game (2007). Krotoski also mentions social play as attractive to women, as well as bringing up the inclusion of narrative plots with more depth as yet another popular feature for female players. Women like to play games that let them learn about themselves, create immersion in atmospheric environments, provide rich characters that allow the player to identify with them, and feature flexibility and personal empowerment (2004). Taylor brings up that games give women experiences they can't access in other contexts; like the ability to traverse a landscape in safety. Women may travel with the knowledge that they are under no further threat than male players from the monsters inhabiting the world, granting women a gender-neutral space to experience both threat and safety (2003).

This analysis can be pulled in direct parallel to the way LGBTQ players might use MMO spaces to move about in a world with their real identity without risking bodily harm. Taylor notes that if game designers can rise to the challenge regarding a more complicated understanding and rendering of gender, immersive and evocative game environments might be able to draw in truly diverse audiences (2003). Eklund has a similar sentiment, noting that while *WoW* isn't a free space it shows queer potential, and that disruptions to the heterosexual matrix that might happen in the game can make use of characteristics that would not be possible in the real world without social repercussions (2011).

The quality of the social environment should be seen as an important asset when designing online games, since it seems to significantly enhance their potential success (Ducheneaut and Moore, 2004). Social

interactivity, through guilds and participation in the game, seems to be a large contributing factor in both LGBTQ minorities and women's immersion in the MMO game world (McKenna and Chugtai, 2020; Pulos, 2013; Humphreys and de Zwart, 2012; Williams, 2011; Nardi, 2010; Yee, 2006b; Cole and Griffiths, 2007; Krotoski, 2004; Taylor, 2003; Eklund, 2011).

Other notes that have appeared in research regarding minorities' wishes for game design is a desire for more diverse cast of romances between NPC characters, since the storyline of the games perpetuate heteronormative ideals. Game designers should also be mindful when conducting technical changes to the game, since minorities was shown to react more negatively to change. McKenna and Chugtai state:

> Our study has some practical implications as well. We found that members of an oppressed group (in our case, the LGBT population) are particularly sensitive to a change in power relation. Often what is dismissed as a technical change can be harmful to the oppressed. When a virtual place was destroyed by a software upgrade, it was not just a new version of the existing software, it was a new version of reality. Therefore, the managers and policymakers are advised to pay attention to the diversity in work and social environments and ensure that a technical change is aligned with the everyday social reality of the people (McKenna and Chugtai, 2020, p. 8).

The avatar, as mentioned previously, has been proven to have potential for a positive effect on minorities, since it may allow them to experiment with identities which are contested in other contexts. Morgan et al. suggested a few key points when developing avatar creators for non-binary and trans players, which included the ability to have different pronouns, designing the avatar creator to not only adhere to binary gender choices but to encompass non-binary bodies and allow players to mix and match customization options at will with no locks based on gender (2020).

Through color and environments, character classes that transcend gender norms, avatar design, gestures and social communities, we can

discern traits that might attract both women and queer players. More detailed definitions of these theorized components can be found in table 1.

Elements for Queer Game Design	Definitions
Social Play	The game should allow social play where players can interact through, ex: gameplay, guilds or roleplay
Character Creation	Character design and in-game customization should allow subversion of gender norms/roles. Ex: clothes not changing design based on avatar gender, hairstyles and makeup not being genderlocked, inclusive body sliders
Classes and Tasks	Character classes/gameplay tasks should allow players to subvert and transcend existing gender norms/roles. Ex: male avatars sewing and female avatars smithing
Gestures	Gestures that allow for queer play/queer readings (especially in response to poor queer representation) should be included in the game. Ex: letting players marry each other with same-sex characters or include romantic gestures or gestures that allow subversion of gender norms/roles
Color and Environments	The game should include colorful, nature-themed environments

Table 1. Taxonomy and definitions of theorized components of appeal- ing game design elements for queer players

Queer representation was excluded from the taxonomy, due to the fact that queer representation doesn't seem to be a factor that has drawn players to these games (due to the lack of it).

3. Method

Continuing forward, the idea is to apply the discerned traits presented in the Queer Game Design Taxonomy to the game *Final Fantasy* XIV. While parts of the created taxonomy has been derived from research focused on female players and their affinity to be drawn to MMOs, there seems to be an interesting correlation in the fact that MMOs have attracted both female players and queer players. A lot of research that has been conducted on MMO games has been undertaken in the 2000's, with a specific focus on *WoW* (or its predecessors.) Therefore, it has been deemed interesting to instead apply the presented ideas on *Final Fantasy XIV,* which arrived on the market years after the wildly popular *WoW*.

Final Fantasy XIV, from now on referred to as *FFXIV*, will be evaluated based on the criteria of social play, character creation, gameplay jobs/classes and tasks, gestures and aesthetic appearance, to determine if this creates potential for queer play. As previously mentioned, queer representation was excluded from the taxonomy due to the lack of queer representation in MMOs, but it will be evaluated in *FFXIV* to see if the game has improved queer representation in comparison to previous titles.

Has the game progressed further than older MMO games when it comes to these game design ideals, or has the genre remained more static? The purpose of the study is to conduct an evaluation of the desired criteria to determine if the game would be appropriate for a more longitudinal study of its queer community.

4. Final Fantasy XIV

FFXIV was first launched in 2010 to widespread criticism. Fearing the game would tarnish the reputation of both its developer, Square Enix, and the acclaimed *Final Fantasy* franchise, which had previously launched critically acclaimed titles like *Final Fantasy* VII and *Final Fantasy* X, the game was remade (Lin, 2015; MMO Populations, 2021). The current version of the game, titled *Final Fantasy XIV: A Realm Reborn*, was instead launched in 2013, and has spurned several expansions, with the next one arriving in Fall 2021. According to MMO Populations, the

game currently has approximately 24 million accounts and 2.2 million daily players and an activity rating of 10/10. In comparison, *WoW* has 113 million accounts and 3.2 million daily players, with an activity rating of 3/10 (2021).

Following the launch in 2013 that remade the game to its core with a new story, code and engine, the game takes place in the fictional world of Eorzea, five years after the dragon god Bahamut destroyed most of the world (MMO Populations, 2021). To enter the game world, the player first needs to create a character and choose a 'job', more commonly referred to as a 'class' in other games.

4.1 Avatars in Final Fantasy XIV

Figure 1. The avatar creation screen that meets the player when they first start the game and are prompted to pick a race (screenshot by author).

As shown in Figure 1, once the player starts the game, they are prompted to make a character. The game starts on the male Hyur (human) avatar, and all but two races are available as both male and female. The player has the option to choose between a diverse range of races: the human Hyur, elven Elezen, tiny Lalafell, the feline Miqo'te, mighty Roegadyn, draconic Au Ra, the tiger-like Hrotghar (male only) and bunny-like Viera (female only).

The races follow the ideal of being anthropomorphic avatars mentioned by Sihvonen and Stenros (2018). Some races, like the Au Ra, present large differences between its males and females, while others, like the Lalafell, have male and female characters that are nearly identical. The range of bodies is quite diverse, although the characters adhere to the ideal that all avatars present athletic bodies and the player cannot change their weight. The player has the ability to adjust the character's height based on a slider that can be adjusted within the frame of the accepted height range of each race. The player can adjust the size of a female character's breasts, but even at the highest setting some races sport next to no breasts while the others remain in a natural range of appearance. Most characters are also conventionally attractive with smaller noses, larger eyes and soft skin, and it is difficult to make a character unattractive or more "normal," given the homogenizing aesthetic of the game.

Once a race and gender is chosen, the player gets the ability to edit their character based on preset values. No sliders are present, but rather the player gets to select between a range of facial features and a vast amount of hair and color options. Hairstyles change depending on the race picked and are partially dependent on the gender picked, but all sport hair that can be seen as traditionally masculine or feminine, which was something that players requested in Morgan et al's. study (2020). A hairstyle that allows the character to sport two buns and a hairstyle that gives the character a thick fringe and long hair, commonly called a hime haircut that is worn most commonly by women in Japan, is available for male characters regardless of race. Female characters in return have several options to sport short styles also available for the male characters.

Once the character is complete the player gets to pick a job, which will determine what gear they acquire in the start of the game and what kind of weapon and role they have: the primary roles to choose from are Tank, Healer or DPS (split in close combat or ranged attacks), in which certain jobs apply. No jobs are gender or race locked: the miniscule Lalafell might pick up a shield and a battle axe and protect their team as a tank, while the large, male-only Hrothgar might heal and tend to the wounds of other players.

While the game adheres to the same heteronormative gender binary like its predecessors, it plays more fluidly with gender in how some races, like the Lalafell, present no clear gender identity, and the character creator has hairstyles and makeup available to all characters regardless of gender. With options like these available, it makes it easier to create a more non-binary character, although the options are still somewhat limited and the body types can't be mixed and matched as the player chooses, as was requested in Morgan et al.'s study (2020). Pronouns also cannot be chosen in the game. Still, the character creator presents a less rigid reading of gender in some instances, allowing players to experiment more openly with their identities through their characters.

4.2 Gameplay and Aesthetics

Figure 2. A character and their pet in one of the starting areas of the game, overlooking the beautiful natural vista (screenshot by author).

FFXIV lets the player start in one of three starting cities, depending on the job the player picked in the avatar creator. The player might start in the city of Ul'Dah, labeled the 'jewel of the desert' in the game, a large city made of stone situated in an environment filled with sand and rocks, with some instances of trees and running water. Limsa Lominsa allows the player to start in a winding, white city located right next to the sea, with large bodies of water and white shores, or the

player might find themselves in the forest city of Gridania, surrounded by trees and flowers, as seen in Figure 2. It draws the mind to the experience Nardi described, where the world in *WoW* felt designed for her since it had bright, feminine colors and natural themes as opposed to the harsh concrete of more masculine games (2010).

The world of Eorzea is diverse, with environments changing from overflowing natural landscapes to the steely, sci-fi inspired design of the enemy of the game, the Garlemald Empire. The story taking the players through these locations is vast and well-written, another game element that was found to be popular amongst female players, and perhaps in extension, queer players. According to the website How Long to Beat, each expansion has an average of 121 hours of story, with the leisure playstyles crossing 200 hours of gameplay for the main narrative in each expansion (2021). A lot of the gameplay is spent doing quests for other characters, traversing the world as the player character realizes their role as the Warrior of Light, but once the main narrative is completed a lot of players spend times raiding or playing through dungeons with other players.

The game has similar gameplay to other MMOs, with players enjoying content together through high-end battles against difficult bosses or dungeons. But just as with other MMOs, players aren't forced to go through raids and dungeons, unless they are connected to the main story. While a player must play through some of this content to progress in the game, some players pick up a craft instead, making food, creating armor or accessories or making furniture for houses. These players then purchase materials from gatherers on the market board, players that traverse the game world to mine, harvest and fish for resources. Through these resources the crafters can then, for example, cook high-end meals, which they sell to the raiders in need of buffs to gain an edge in the difficult battles that lie ahead of them.
These jobs are available to all players and all genders, just like the experience Nardi (2010) described in her book, where male characters and female characters alike transgress normative gender roles through gameplay. The world becomes more open and gender-neutral in instances of shared play, and a crafter or gatherer, shying away from combat, is just as important for the game world as the raiders.

Just as in other MMOs, players spend a lot of time gathering gear to be able to customize their characters. *FFXIV* is no different, with the exception that clothes are more diverse and not as structured across the gender binary as in earlier games. In *FFXIV* it is possible to play as a male character and purchase a bridesmaids dress on the market and wear it with no alterations to its design, just as a female character might sport a best man's suit. This opens up a lot of potential for players to experiment with their identities and engage in queer play by subverting gender norms within the game world.

One thing that *FFXIV* hasn't readily improved compared to earlier titles is the inclusion of queer characters within the narrative. There is one instance where the player might encounter a character that seems to subvert gender norms, in that he is presented as almost comically flamboyant in a way reminiscent of the stereotype of a gay man, a vision that is strengthened by the fact that he is a hairdresser, as seen in Figure 3.

Figure 3. The hairdresser in the game which seems to be coded as a stereotyped flamboyant gay man (Screenshot by author).

However, this representation can be regarded as offensive rather than comical, depending on a player's standpoint. The game severely lacks in its inclusion of non-normative genders and sexualities, yet allows the player to subvert norms by allowing them to wear clothing traditionally applied to a certain gender role.

The game also allows players to marry other players through their avatars in a marriage ceremony that mimics a wedding, and avatars of the same-sex may marry each other without any hindrance from the game. Just as in previous titles in the same genre players are afforded a vast amount of emotes and gestures to communicate with other plays, and these might be used to indulge in flirting with other players, potentially inserting queer play even though queer characters are missing from the overarching design of the game.

4.3 Queer Communities in Final Fantasy XIV

The queer community seems to thrive in *FFXIV*. Through a simple google search of '*FFXIV* lgbtq free company' (free company is the equivalent of a guild in *FFXIV*) you are immediately directed to a website called "Gayorzea" (Gayorzea, 2021), which greets its visitor with the information that it was created in 2016 and has 26 affiliated LGBTQ friendly guilds spread across servers as well as a discord with thousands of members. They state:

> Sadly even today, all around the world & especially online, members of the LGBTQ community face hate and aggression. Gayorzea is a pocket of calm & friendship away from that and is widely recognized for it's (sic) pleasant atmosphere.
>
> Gayorzea, 2021

They continue to say that not only do they house LGBTQ friendly free companies, they also work to create a cross-world linkshell and attempt to create fellowship and friendship across all servers in the game world, as well as helping out LGBTQ creators and streamers reach a wider audience. They also arrange a yearly pride month in the game that takes place in June, which they call the largest gathering of LGBTQ players in *FFXIV*. They note, however, that the event is not political and merely used to meet new people, make new friends and have fun.

Evidently, the queer community seems to be thriving. *FFXIV* is also known for its friendly atmosphere, far from the toxic abuse often found in other games (Sturak, 2020). While this cannot be studied during this article, due to the extensive time it would take, as a player of the game with 250+ hours logged in, I can share anecdotally that in my

experience *FFXIV* sports a friendly community, where players often help each other rather than sending abuse. I have never observed homophobic language in the general chat, although this might be because players communicate in more private channels. This needs to be studied more extensively by conducting interviews with long-time players of the game that identify as queer.

5. Conclusion

Research undertaken over the years seems to prove over and over again that MMO games attract queer communities and queer players to a large extent. It can be theorized that this comes down to a taxonomy of queer design elements: social play, character creation, classes and tasks, gestures and color and environments. *FFXIV*, while now a decade old, is a newer MMO that seems to both follow the traditional design of an MMO game while also allowing players to traverse gender and sexuality with further ease than previous titles. It seems to harbor a strong queer community partaking in and arranging events and, notably, seems to be known for its friendly environment.

Each of the gameplay elements from the taxonomy are present in *FFXIV*, with some improvements to character design compared to previous popular titles.

Therefore, it can be concluded that it would be of great interest to conduct a more longitudinal study of *FFXIV* with members of these LGBTQ free companies, or queer players enjoying the game solo, who might share their experiences and discuss what elements of game design they find the most appealing, which could benefit the development process and design of future games for a community using MMOs as a place to belong and find voices that can echo their own as they explore their true identities.

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Chapter 12

Death of the Gamer: Grief and Memorialization in Digital Culture and Video Games

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Abstract

This chapter aims to present, discuss, and analyze the potential role of digital games within practices of memory, bereavement, and inheritance. The chapter examines how users inhabit game environments, how their in-game memories and identities extend into the real world, and what kind of digital legacy players may be leaving behind. A three-part study based on theoretical frameworks relating to memorialization and grief processing is conducted to look at how games can become part of mourning and memorialization practices.

Keywords: games, memorialization, bereavement, death, digital legacy, digital culture

1. Introduction

In a short webcomic titled *digital ghosts*, the author, SAM, relates an incident following the death of a friend. Accompanied by illustrations of a Wii console and various *Just Dance 4* (Ubisoft, 2012) poses, the webcomic is a brief reflection on the connection between modern technology, mortality, and memory. It was shared by the author on two non-grief specific sites, namely Twitter and Tumblr and, in a year after its posting, it garnered over 60.000 likes and 600 replies and quote

tweets from other Twitter users who shared similar stories. The webcomic reads as follows:

> after 7 years, i took out my wii and opened up just dance.
>
> my favorite song was oh no! by marina and the diamonds. i never dared to touch it, though. my best friend's high score was on it. she died seven years ago.
>
> beating it, erasing it- it felt like a sin. like i was purposefully telling her that she wasnt important anymore.
>
> isnt that strange? wonderful? my family could tell me stories of when my grandfather was still alive, passed down through generations and muddled by memory until they are no more. but now, memories of the deceased can exist in another, more permanent medium. at the very least, permanent by choice. they feel like glimpses of the past, a collision between times. like looking at the negative space where you feel a ghost should be.
>
> i pressed play. i got a high score. i guess this is an acceptance, of sorts. im sorry. you always made a mark much larger than that on a screen. [sic]
>
> (@notedchampagne, 2020)

Just Dance 4 (Ubisoft, 2012) is a popular multiplayer rhythm game that includes a collection of classic and modern songs and dance choreographies. It is widely regarded as a fun party game, often played between friends and family. However, in SAM's case, the game acts as more than just an object of entertainment; it acts as a repository where the memory of a loved one can be stored and revisited even after their passing. In the social context of death, the game attains a new meaning: it becomes an heirloom where high scores are akin to stories that evoke remembrance. The act of erasing these high scores constitutes a loss and inflicts grief upon the bereaved. Yet, revisiting the memories stored inside the game also leads to closure and acceptance, enabling the bereaved to mourn and come to terms with their loss. The game becomes a site where the bereaved can undergo a grieving process.

This chapter aims to further explore the relationship between digital games, death, and memory. It presents, discusses, and analyzes the

potential role of digital games within practices of memory, bereavement, and inheritance. The chapter examines how users inhabit game environments, how their in-game memories and identities extend into the real world, and what kind of digital legacy players may be leaving behind. Moreover, theoretical frameworks relating to memorialization and grief processing are used in a three-part study to look at how games can become a part of mourning and memorialization practices.

2. Death in the Digital Age

Early attempts to establish dedicated spaces for online remembrance and mourning practices can be traced to the emergence of the first official memorial websites in the mid-1990s. Currently, however, there are numerous ways and places to mourn online. Digital obituaries and virtual candle websites, for example, represent contemporary online mourning practices that occur within the socio-cultural context of bereavement and make grief visible in virtual spaces.

Grief occurs when a person is confronted with the loss of someone they cared about. It brings both psychological and social changes as the bereaved have to deal with complex emotions. Mourning is a response to grief that allows the bereaved to make their loss known to others and turn death into something visible. It is manifested through a diverse range of practices such as the creation and curation of objects like mourning jewelry, photo albums, and journal collections.

Within Thanatology – the study of death and dying – various theoretical frameworks reflect the way people respond to death and process their grief. Among the first ones to emerge, the paradigm of 'letting go' implies that grief is a process that happens in stages and that there is a period of time during which grief is resolved. Stemming from Freudian psychoanalytic theory, the 'letting go' approach to loss proposes that grief frees the bereaved from their attachment to the deceased through confronting the memories and emotions connected to the person they lost. The paradigm led to the creation of a number of stage theories and models meant to measure the progression of grief and its eventual resolution. The most well-known is Elizabeth Kübler-Ross's (1969) five stage model which claims that those experiencing grief go through a series of five emotions: denial, anger, bargaining, depression,

and acceptance. Here, acceptance is the final stage where grief is resolved.

However, this framework has been challenged and it has received criticism for being prescriptive and constrictive, as many people experiencing grief have found themselves unable to move on and let go (Gray and Coulton, 2013, p. 36). Instead, in recent years, the field of Thanatology has experienced a paradigm shift where new discussions about maintaining relationships, cherishing vivid memories, and recognizing the social presence of the dead even after bodily demise have come to the fore. Klass et al. (1996) propose the 'continuing bonds' model in which grief is not perceived in stages but instead it is seen as a renegotiation of the relationship the bereaved has to the deceased. This theory becomes relevant in the digital age due to an increase in digital death practices that facilitate remembrance and allow the bereaved to maintain their connection with the deceased and grieve through increasingly diverse processes. This chapter will examine practices relating to virtual memorialization, memory, digital legacy, and heirlooms.

2.1 Virtual Memorialization

Memorialization facilitates mourning and provides an opportunity for the bereaved to express their grief. According to Rumbold et al., memorialization supports people searching for meaning following loss, offering individuals an opportunity "to form their own distinct responses and reimagine their lives without the deceased, while also integrating their memory. Through memorialization, the past, present and future can merge to form a new understanding of an ongoing relationship with the deceased" (2020, p. 7). Therefore, memorials serve as objects or spaces of remembrance and negotiation of loss, which provide comfort and familiarity to the bereaved.

Memorialization takes various forms. Perhaps the most widespread practice is through physical memorials, for example graves and crypts, which are important for locating the deceased, reuniting them with family, and honoring their wishes (Rumbold et al., 2020, p. 6). Objects that belonged to the deceased as well as funerary portraiture and writing can also be used in memorialization. However, some people are increasingly moving towards the merging of physical and digital mourn-

ing spaces. Physical memorials are sometimes supplemented by digital ones since funeral service providers now offer service packages that include, for example, digital condolence books or online obituaries.

Common online memorials consist of web pages created by the bereaved to commemorate the life of the deceased and capture their achievements. These sites are frequently designed to mimic traditional spaces for loss – such as shrines, cemeteries, and gardens of remembrance – where the bereaved can gather to share eulogies, light candles or leave flowers. There are many ways in which online memorials resemble physical ones, as both contain information about the person who has died and both allow visitors to strengthen their bond to the deceased and connect with other people who are grieving. Subsequently, they can be considered grief-specific online spaces.

However, not all online memorials are created in grief-specific spaces. Memorialization also happens in less bounded spaces for grief, in which the bereaved have appropriated and displaced available online platforms and services to make their loss visible. Gray and Coulton argue that non-grief specific sites can "fall outside of the dominant filter of memorialisation, in ways that reflect a broader and richer history of technologies being assimilated to store, record, retrieve and, importantly, make visible experiences of loss, memories of death and the spectral presence of the dead" (2013, p. 32). Most often, social networking sites like Facebook, YouTube, Flickr, and Twitter are used by the bereaved to either construct profiles for the deceased or to memorialize existing ones.

Facebook is frequently used to create online tribute pages for those who have passed and to connect with communities who may offer support to the bereaved. The Facebook account of a person who died can also be memorialized through a request to Facebook. When a profile becomes officially memorialized, it can no longer be accessed or maintained by a user, but the content previously shared on it remains visible (depending on privacy settings) and other users in the Friends list can share memories on the timeline. Hence, the account serves as a space where the bereaved can express both common and individual loss and create eulogies for the deceased.

2.2 Memory, Digital Legacy, and Heirlooms

Data left behind by the dead can play an important part in the grieving process and in the construction of personal memory. Gray and Coulton note about these pieces of information that "like traditional material practices, they may help the bereaved to re-make lives, re-craft identities and re-draft personal histories after loss" (2013, p. 38). Both personal and collective memory rely on records of the past and on technologies and practices of remembering. I use the term 'personal memory' to refer to autobiographical memory that involves the recollection of specific events from one's life. I use 'collective memory' to refer to memories shared by several individuals such as a family or a group of friends, but the term can also be viewed on a larger scale, for instance to reference national or public memory.

The digital information left behind by a person after their death constitutes their digital legacy. This can be formed by information found on objects like personal computers, phones, and data storage devices, but it can also include a person's digital footprint. The sites and services people access as well as their communications, content, and contributions on the Internet represent their digital footprint, or their unique set of traceable digital activities.

In bereavement studies, it is often underlined that the bereaved take on the role of custodians as they take responsibility over a plethora of things *l*eft behind by the deceased (Banks et al., 2012; Rumbold et al., 2020). Specifically, Briggs and Thomas mention the psychological burden accompanying the inheritance of digital devices like phones and laptops (2014, p. 129). The data on these devices is frequently inaccessible, for instance due to password protection or because the information is scattered across multiple platforms. Nevertheless, this data holds material of strong emotional significance for the bereaved or the promise of uncovering new information, causing unnecessary frustration or hurt when they cannot be accessed.

For this reason, there exists a need for designing hardware and software that account for a user's death and enable the passing on of digital legacy. Massimi and Charise introduce the concept of thanatosensitivity to describe HCI research and design that actively considers

and integrates mortality, dying, and death into research and practice (2009, p. 2460). The authors argue that, as devices become more personal and individualized, they also become more difficult for others to decipher or employ in the event of death. Consequently, the concept of thanatosensitivity is a novel approach to HCI that recognizes and engages with death in the creation of interactive systems by facilitating and enabling remembrance, digital inheritance, and curation.

Thanatosensitive design is closely related to practices of memorialization and digital legacy. Facebook's legacy contact can be considered a thanatosensitive feature. A legacy contact is a person delegated by the user to look after their account if it becomes memorialized. The legacy contact is able to request the removal of the account, update the profile and cover photo, or pin a post, for example to share a final message from the deceased or provide information about a funeral service.

Similarly, Banks et al. (2012) propose the design of Technology Heirlooms. A Technology Heirloom is "a technological/digital artifact that is designed with the intent that it might outlive its owner and come to be passed on, and that in some way either materially or conceptually it might carry with it an imprint or impression of the previous owner" (Banks et al., 2012, p. 69). The authors relate that heirlooms are artifacts, passed down through generations, which provide a shared sense of history, heritage, and values. They also play an important role as triggers for personal memory. Thus, a Technology Heirloom is designed to preserve the memory of the deceased and also to facilitate remembrance and mourning for the bereaved.

3. Examining Games as Thanatological Platforms

The digital age has deeply impacted the social and cultural construction of death and the spaces in which grieving is talked about and observed. More and more studies have begun to discuss various connections between technology and user death as digital devices, online networks, and virtual worlds are now a part of digital death practices. However, few academic studies turn their attention towards digital games. Nevertheless, I propose that due to their novelty, variety, and the unique interactive nature of the medium, digital games hold the potential to expand current understanding of commemoration and

grieving in online spaces.

The qualitative research design of the study presented in this chapter consists of three phases. Firstly, I conducted an integrative literature review to synthesize and review representative literature on the topic of games, grief, and memorialization. Secondly, I employed an ethnographic methodology to observe virtual memorials, digital funerals, and other types of online mourning and commemoration practices in action. Thirdly, I conducted field research by organizing an in-depth interview with a player who used video games in their grieving process after the loss of a friend.

The purpose of the literature review is to determine if a topic is researchable, to report the results of closely related studies, and to establish the importance of the current study in relationship to previous ones. The review consists of academic literature, industry reports, online media, and other types of material gathered from a variety on intersectional fields such as HCI, game studies, Thanatology, sociology, anthropology, psychology, and ethnography. The inclusion criteria consisted of publications in English that were published after the year 2006, thus providing relevant information from the past fifteen years. Multiple searches were conducted and the publications were thematically analyzed based on their relevance to the topic of memorialization, bereavement, and digital legacy.

After establishing the theoretical foundation of my study by gathering knowledge and findings from the literature review, I proceeded to familiarize myself with the theorized concepts by conducting field research. I visited online memorials sites such as *healgrief.org* and *forevermissed.com* which allow users to visit and create memorial pages, light virtual candles, and share condolences and mementos. Likewise, I looked at my own past interaction with several Facebook posts from three acquaintances who have shared messages about a loss in their family. I also watched videos from online funerals in massively multiplayer online role-playing games (MMORPGs) like *World of Warcraft* (Blizzard Entertainment, 2004) and *Final Fantasy XIV* (Square Enix, 2013). This online ethnography allowed me to directly observe and, at times, participate in the mourning and remembrance practices that people create and engage with in different online environments. It

gave me the opportunity to understand why and how people create online memorials and what kind of meaning, rituals, and sentiments are being shared by the bereaved to the public.

In addition, I conducted an interview with SAM, whose work I have come across while conducting field research on digital legacy. The interview was an in-depth semi-structured qualitative interview conducted in April 2021 via instant messaging. It comprised of six open-ended questions relating to topics of death, memory, and grief. Informed consent was used to tackle the ethical considerations that may arise during such a discussion.

The reviews, investigations, and interpretations of my research will be related in the following sections of this chapter. I will begin by analyzing how games can be employed in grief processing and how players appropriate game affordances and include them in memorialization and mourning practices. I will then examine the relation between games and the creation of memory. Lastly, I will discuss whether or not games can become heirlooms and enable the passing on of digital legacy.

4. In-game Mourning

Game memorials share commonalities with other forms of virtual memorialization, and they can be similarly classified into grief-specific and non-grief specific spaces. Much like memorial websites, grief-specific games tend to be biographical, emotional, and developed with the purpose of memorialization. For instance, in *That Dragon, Cancer* (Numinous Games, 2016), two of the developers, Amy and Ryan Green, reflect on their experience raising their son, Joel, who was diagnosed with terminal cancer soon after his birth. Amy Green relates in an interview about her son that "in a lot of ways his life will only matter if we make it matter" (Tanz, 2016). The game is meant to be meaningful and impact people, making the players understand the life and struggles of the child and his family. Therefore, the game serves as a tool of remembrance and legacy.

The player takes on the role of the parents and can interact with the child and other characters. The game is built around certain moments in the family's life, showcasing fragmented memories, photos, voice re-

cordings, and crucial events. These same elements commonly appear in online memorials where the bereaved include stories and information about the life and achievements of the deceased. Including these thanatosensitive elements into the design of the game allows players to repeatedly contribute to the process of memorialization through their play and facilitates the construction of a digital legacy.

Ryan and Amy Green state that working on the game was an important outlet to explore their grief and to keep the memory of their son alive (Tanz, 2016). Although the child and his parents are represented in an abstract way as faceless characters, the game memorializes his life and the bond he had with his family. The game is essential in the parents' grief processing which adheres to the 'continuing bonds' model, wherein the social presence of the deceased is maintained even after death. Thus, the game allows the parents to mourn both inside and outside of the game world.

However, grief-specific games are uncommon and are not the only spaces where in-game mourning can occur. In my interview with SAM, the artist also expressed that playing *Just Dance 4* (Ubisoft, 2012) contributed to their mourning and grieving process. Albeit the game is far removed from death and is intended as a party game, SAM states that "it was there the entire time i was mourning and trying to heal" (SAM, 2021). SAM recounts their grieving process, relating that "there was an actual progression of me avoiding playing the song [*Oh No!* by Marina and the Diamonds], to playing it and putting the remote down so i couldnt get a score, to playing it a bit and putting the remote down, etc etc" [sic] (SAM, 2021). After the loss of their best friend, the game provided a space where SAM could revisit their friend's memory, which was marked by the high score on Marina and the Diamonds' song. This reflects that games have the capacity of serving as tools of remembrance regardless of their relatedness to topics of death. In this case, a rhythm game acts as a memorial that provides comfort to the bereaved and helps them confront their loss.

Yet, memorials reflect not only individual but also collective loss. Grief is frequently expressed in games that have a large following or tight-knit communities. *World of Warcraft* (Blizzard Entertainment, 2004) is an MMORPG with large communities that often organize commemora-

tions for deceased players. Haverinen (2014a) notes that memorialization activities in WoW began very quickly after the launch of the game, and she discusses the case of an in-game virtual funeral hosted by WoW players in 2006. A more recent event happened in 2020, when a remarkable number of WoW players from across multiple servers gathered inside an in-game landmark called the Cathedral of Light to pay their respects to Byron Bernstein, also known as Reckful, a popular Twitch streamer and professional esports player.

Online gaming environments are deeply social worlds inside which players create their own digital cultures. Players spend many hours together, have joint interests, and may choose to include or share details about their personal lives. Losing a member from this type of community creates a similar sense of loss and bereavement as losing any other relationship (Lagerkvist, 2013). In-game virtual funerals are a way of memorializing this loss. They share many similarities with traditional funeral practices while also incorporating aspects of the game story and culture. Generally, players gather in spaces that are seen as meaningful in the world of the game, as in the case of the Cathedral of Light which resembles a real-life church. They may choose to dress in a certain way, perform a certain action like kneeling, or leave tributes that are deemed symbolic or valuable.

In-game memorials are also often the only way the community can give tribute and remember a deceased player. They allow members of the community to come together despite geographical or social location and share their loss with others in a familiar surrounding. In April 2020, during the COVID-19 quarantine, *Final Fantasy XIV* (Square Enix, 2013) players organized a virtual funeral for a fellow gamer who succumbed to the virus. Unable to travel and meet each other, a group of online friends decided instead to meet on one of the game's servers. To their surprise, they were joined by hundreds of other players who, as seen in Figure 1, logged on at the same time, equipped their digital avatars with black clothing and umbrellas, then marched in a funeral procession through the online fantasy world. While not all players personally knew the deceased, the death was perceived as a loss to the community (Elliott, 2020). The procession lasted for approximately an hour and ended near a large tree where players shared their final goodbyes.

Figure 1. Players participating in a funeral procession in Final Fantasy XIV (image credit: Elliott, 2020)

Therefore, in non-grief specific game spaces, players appropriate existing game affordances and confer them a new meaning that accommodates their need to express grief. They adopt ritualistic procedures that mimic established death practices and address loss both emotionally and socially. In the absence of a physical body to be mourned, virtual funerals and in-game memorials act as rituals that honor the deceased and symbolize lost relationships. Like other digital or physical memorials, in-game memorials bring comfort and closure and create a space where the bereaved can gather and strengthen their bonds with not only one another, but also with the deceased.

5. The Role of Avatars

It is important to note that in-game mourning extends to both the player and their character or avatar. The avatar is seen as an extension of the player. In the game world, the avatar represents the player's progress which reflects their skill, the time they invested playing, their preferred aesthetic, and so on (Mazzeo and Schall, 2014, p. 197). In MMOs, it also represents a certain role within the world of the game and it enables the player to establish a reputation and connection to others. Consequently, the death of a game user inevitably brings about the metaphorical death of their character and is perceived accordingly as

a loss both within the realm of the game and in real life.

Players tend to identify with the character or avatar they control in a game. Klimmt et al. describe identification as a temporary association between a player's self-concept and concepts that describe the character (2009, p. 357). They argue that identification is important for game enjoyment and immersion. Sibilla and Mancini (2018) also highlight that identification is increased when players are given the ability to customize their avatars.

Sibilla and Mancini (2018) list two types of user-avatar identification: actualization and idealization. Through idealization, players associate with character attributes that they would like to have rather than with those they already possess. However, some players prefer to create actualized avatars which correlate with their own appearance, personality, and other attributes.

Whether realistic or idealized, the avatar is an extension of the identity and personality of the player. It reflects various facets of the individual behind the screen. Consequently, avatars are commonly used in processes of virtual memorialization. In WoW, the non-playable character (NPC) Caylee Dak memorializes a user named Dak Krause who died of leukemia in August, 2007. Albeit an idealized character, the NPC is an exact replica of the avatar once used by Krause, bearing the same gear as well as the same pet, Dusky, who was also added as an NPC. Fittingly, the character serves as a quest ender to a mission that features a poem about the transcendence of death.

Following his passing in July, 2020, Twitch streamer Byron "Reckful" Bernstein was similarly memorialized through the addition of an NPC based on his character. A Rogue Trainer named Reckful (Figure 2) can now be found in the Cathedral of Light, the place where players gathered to mourn Bernstein after receiving news of his suicide. The NPC has a line of dialogue that alludes to Bernstein's achievements in WoW, and players can respond to it by saying "it was good seeing you again." Additionally, users can perform certain actions such as hugging or waving to which the NPC responds. All of these features commemorate Bernstein and allow other gamers to pay their respects, share their grief, celebrate his accomplishments, and keep his memory alive.

Figure 2. World of Warcraft NPC commemorating Reckful
(image credit: author screenshot)

The abovementioned characters were both introduced in WoW by the developers at Blizzard Entertainment, yet most often it is the players themselves who employ avatars in memorialization processes. Bainbridge discusses the creation of Ancestor Veneration Avatars, or characters created in memory of someone – such as a relative – who passed away (2014, p. 218). He exemplifies one of the characters he created in WoW, a priest named Maxrohn, which was modelled after his deceased uncle, Max Rohn, who had been an Episcopal priest. In this case, the character serves as an emulation and can be viewed to some extent as an actualized avatar because it is meant to represent a part of a real person's identity.

Bainbridge also talks about "Bridgebain," another avatar he created in memory of his late grandfather (2014, p. 215). The name he chose for the character is based on his grandfather's telegraph cable address which to him symbolized his grandfather's passion for science and technology. He recounts that his grandfather's adventurous and innovative spirit fit well into the world of *Tabula Rasa*, the MMORPG in which he created the avatar. Bainbride states that "in Bridgebain and through him, I could reexperience my grandfather in adult terms, although I was only seven years old when I said goodbye to him as he lay on his deathbed" (2014, p. 217). By embedding his grandfather's characteristics into the avatar, the author was able to reconnect with his deceased relative and negotiate his loss through a reconstruction of his memory that conferred him a new understanding of the person

his grandfather used to be.

Therefore, the avatar gains a new meaning and function both inside and outside the world of the game. Avatars can be used to preserve the connection players have to a person they lost. Actualized avatars can be compared to funerary portraiture, showcasing a visual representation of the person who passed away. Idealized avatars are more abstract but they still reflect facets of a player that are representative and identifiable. I would even argue that, similar to the way memorialized accounts on social networking sites are used to build a more elaborate picture of the deceased, avatars can be used for the same purpose. In online memorialization practices, the biography of an individual can be constructed through the combination of narrative bits that are available on a social networking sites, for example photographs and status updates. While less informative, a player's avatar still contains elements that can be used in the crafting or recrafting of an individual's identity, as they can embody certain traits, professions, or emulate physical characteristics that are representative of the deceased.

6. Games and Memory

Because players interact with each other mainly via their characters, avatars also serve as a tool in the construction of memory. Users immersed in mediated narratives are likely to develop a strong sense of connection or familiarity with characters encountered repeatedly or continuously over time (Klimmt et al., 2009, p. 353). In RPGs, in particular, the avatar has a significant social role. As Haverinen explains, RPGs transform an avatar into a character which represents "both the story of the role-play and the personal interests of the player" (2014a, p. 157). She also states that "the communal spirit is usually strong among players who have played together for hundreds of hours and often even years. They have shared their personal lives with each other, and have 'lived' together in the story they have created for the game" (Haverinen, 2014a, p. 157). Thus, as an extension of the player, the avatar is tied to certain memories that players develop together in the game and it can become important in practices of memorialization and remembrance. Likewise, other elements of the game or even the game itself can contribute to memory-making. Of particular interest in this case are

personal and collective memories. In my interview with SAM, the artist recounts: "there was a period in time where we had a week-long sleepover shortly after our birthdays (we have the same one) and for a good chunk of that time we would play just dance. i still have the wii and cd actually" [sic] (SAM, 2021). In this case, *Just Dance 4* (Ubisoft, 2012) is part of a collective memory shared by SAM and their best friend. It acts as a reminder of an event that was significant in their friendship.

SAM's mention of the game CD and Wii prompted me to ask a series of follow-up questions, which led to the following exchange:

> ME: Is there any reason why you still keep the Wii/CD?
>
> SAM: my little sister occassionally plays on it, so there hasnt been a need to sell it yet! if we were to though i think i would take a few moments to just come to terms with it
>
> SAM: i have a small wallet with objects of memories of her, and the cd holds a similar sentiment
>
> SAM: the idea of parting with it comes a lot easier than it would have, say, 7 years ago, but i still like it as a memento you know? like a small reminder to not forget her entirely
>
> ME: Yea, I definitely understand. [...] As far as I gather, you avoided playing the game after your friend passed away? Can you tell me a bit about that?
>
> SAM: i still played the wii, just not that one song in particular! its been a long time ago so im not sure of my reasoning, but to past me i was fine playing other wii games and songs as long as they werent oh no!.
>
> SAM: i do remember her being happy with the high score, so when i would see the song and her name on the menu i would be reminded of her victory in that way
>
> (SAM, 2021)

After their friend's passing, the game gained a new meaning in SAM's personal memory, becoming a symbol of the connection they had to their friend. This new meaning extends to both physical and digital elements related to the game.

Along with other objects, the CD acts as a memento, an artifact that

holds sentimental value and evokes memories. The creation and curation of materials that embody an association with the deceased is often part of the grieving process, since artifacts play a major role in the construction of memory and they also facilitate mourning. Artefacts are defined by their materiality and, in that sense, they are similar to heirlooms and physical memorials which allow the bereaved to locate the deceased and confront their loss through their own spatial proximity to the memorial (Arntfield, 2014; Rumbold et al., 2020). The CD provides a physical connection to the memory of a person who passed away and its potential removal from SAM's proximity is perceived as a loss.

Similarly, the high score on Marina and the Diamonds' song has a particularly strong link to the memory of SAM's friend, evoking an event that marked her success in the game. *Just Dance 4* (Ubisoft, 2012) can be viewed as a scoring game in which the main goal is to achieve the most valuable score within the parameters of the game world in a single iteration of gameplay. This score is a representation of the player's progress in the game. In scoring games, progress and enjoyment are directly connected, as players typically aim to achieve a personal best, the best score on a given machine or the best score amongst a group of peers (Mazzeo and Schall, 2014, p. 199). The achievement of this goal leads to enjoyment and the player emerges from the gaming experience with a greater sense of fulfilment. Therefore, the high score memorializes the progress and success of SAM's friend in the game world, which in turn affected her experience in the real world, leading to the creation of a personal memory surrounding her victory and the enjoyment she felt.

7. Games as Heirlooms

Objects hold meaning and memories attached to them, becoming imbued with the histories of their owners as they change hands. After experiencing a loss, it is common for the bereaved to take on the role of custodians, taking responsibility over the things left behind by those who have died. These things do not have to be solely physical objects, but can also be digital, for example in the case of someone's digital legacy. A person's digital legacy contains information about them and reflects many different facets of a person. Subsequently, it may constitute something of value for those close to them.

Because of the connection between game elements and personal memory, the erasure of the high score is equated to the erasure of the deceased's social presence. SAM explains:

> SAM: i think beating that high score seemed rude? i remember my parents holding a party and the other kids avoiding playing that song after seeing her name on it as well, but i remember their reasoning being "shes dead and its rude"
>
> SAM: which is what it was to kids on a surface level i think, but at the same time i associated beating her score with *not caring* about the memory we had at that time
>
> SAM: kind of like taking a photo of a deceased family member off the wall. its rude, but you keep it up there because they still have a place [sic]
>
> (SAM, 2021)

While less detailed than a family photograph or a social media account, a game element such as a high score can still show a person's skill, progress, and success. A high score is an indexical trace of the player and a testament to their prior presence. It memorializes the player and offers a connection to the past. In that sense, the game element acts as an heirloom because it extends beyond the life of the player and sustains the social relationship between the deceased and the bereaved. Banks et al. state that many sentimental items are kept so as to protect them, since the bereaved are often compelled by a sense of obligation or the desire to honor the deceased and their wishes (2012, p. 75). Therefore, removing elements that evoke their memory can be seen as disrespectful or inappropriate. On the other hand, keeping those objects plays a major role in grief processes where the bereaved wish to continue their bonds with the deceased and maintain their social presence.

In addition, Rumbold et al. also mention that the sharing, storing, and dispensing of objects that have belonged to the deceased mirrors an inner renegotiation of relationship with that person (2020, p. 6). SAM and those close to them have kept the game for seven years after their friend's death but, ultimately, SAM beat the high score as part of an ongoing grief process. Nonetheless, *Just Dance 4* (Ubisoft, 2012) still

acts as an heirloom: it is something that SAM shared with their friend in the past, something that still has meaning in SAM's personal memory, and something that SAM currently shares with their younger sibling and other people.

Heirlooms and other artefacts of sentimental value are generally preserved for three primary beneficiaries: the owner themselves, a known other for whom items are kept to bolster a sense of shared connection, and an "unknown" other for whom items are preserved as a form of legacy (Banks et al., 2012, p. 69). The previously discussed case of *That Dragon, Cancer* (Numinous Games, 2016) is a good example of this. The game was created by the developers to memorialize their lost son, as Amy Green explains: "we'd love for it to impact people and for it to be commercially successful. But there's a piece of me that says, maybe it's just for us" (Tanz, 2016). The Green family are the known others for whom the game acts as a connection to Joel and his memory, while the players are the unknown audience to whom the game reflects Joel's legacy. Similarly, SAM also preserves the game for themselves and for known others such as their other friends and relatives.

Briggs and Thomas identify three main activities connected to the preparation of a digital legacy (2014, p. 130):

> (i) curation, the active process of taking personal records and annotating them so that someone else can make sense of them;
>
> (ii) creation of mementos by collating those curated materials in order to produce an artifact such as a scrapbook;
>
> (iii) active reminiscence where people tell stories about the past based on their own memories.

As shown throughout this chapter, digital games can be used in all of these three activities. Games like *That Dragon, Cancer* (Numinous Games, 2016) are constructed from biographical material such as personal memory and family records. These materials are curated to accommodate both the bereaved and the deceased. The game allows the Green family to grieve and reminisce while it also memorializes their lost son and makes sense of these personal materials in order to tell his story to a wider audience.

Game elements can also be used as mementos. Bainbridge (2014) used game avatars to collate characteristics of his deceased relatives and create a virtual representation of them in the form of Ancestor Veneration Avatars. In this case, the avatars act as a scrapbook where the author collects aspects of the deceased that he deems representative or memorable. Similarly, SAM also uses elements like game CDs and high scores as mementos. These elements attain new meanings as they become connected to someone's memory and allow the bereaved to reminisce about the deceased and renegotiate their relationship with them.

Games can sustain social relationships and bolster ideas of shared memories, history, and values. Therefore, they can be used in memorialization and mourning practices. This also indicates that they may accommodate thanatosensitive design, which would account for a user's inevitable demise by considering and integrating aspects relating to death and bereavement. Consequently, games have the potential to be part of someone's digital legacy and become Technology Heirlooms.

8. Closing Statement

Massimi and Charise affirm that "today, we are as likely to inherit a loved one's collection of hard drives, USB keys, SD cards, and email accounts as we are collections of papers, journals, and photographs" (2009, p. 2459). I would argue that, in the near future, video games may be added to this list. As previously discussed, digital games can foster a wide range of mourning and memorialization practices. They can also become artefacts connected to personal and collective memory or be part of someone's digital legacy. Yet, in order for games to become fully fledged Technology Heirlooms, a few issues need to be addressed.

Digital footprints can be used actively by a user to share information about themselves, however, passive information is also stored, often unknowingly to the user. This aspect raises questions about the possibilities of digital legacy. What happens to our data after we die? Who gains access to it? What can be accessed and what remains hidden? This type of data can be exceedingly complex and can raise numerous issues relating to ownership and accessibility, as individuals do not always own the rights to their own data.

Oftentimes, a console, computer or mobile are the only physical manifestation of a game and its data. Yet, as Banks et al. (2012) mention, these manifestations can feel quite conceptual to individuals since people may not always know how to access them. A game's save file, for example, can be hard to trace, especially if it is on someone else's device. A person's game collection can be spread out on multiple platforms like Steam, Origins, Epic Games, and so on, or they may have multiple accounts. Access to this data is tied to passwords, remote hosting or even biometrics, and it may become totally inaccessible in the event of the owner's death. In cases like these, a thanatosensitive feature like a legacy contact could prove useful to ensure that the data can be accessed, managed, and passed down onto others, similar to the way a legacy contact can memorialize a Facebook page.

Another issue stems from the fragmented and dynamic nature of the digital medium. Arntfield comments that the wide accessibility and instantaneity of digital memorials comes at the cost of durability and stability (2014, p. 90). Virtual memorials, including games, are vulnerable to loss of data, deletion, failure of function, file corruption, etc. While physical memorials are traditionally built to endure the test of time, digital memorials are immaterial and often ephemeral. Bainbridge talks about the loss of his avatars – including the one modelled after his grandfather – that ensued after the MMOs *Star Wars Galaxies* and *Tabula Rasa* permanently shut down their servers (2014, p. 216). He highlights the fact that currently there exists no way to revive MMOs and other online virtual worlds once they have been closed down. Perhaps a solution to this may come from game conservation and archiving efforts. Institutions like the UK-based National Videogame Archive aim to preserve games and their history.

However, MMOs in particular represent a challenging case since they depend on not only software, hardware, and network dependencies, but also on complex and variable social interactions which are difficult to formally model. Celia Pearce offers an insight into how MMO communities may be brought back to life. In her book, *Communities of Play* (2009), Pearce researches a group of *Uru: Ages Beyond Myst* players who relocated to other virtual worlds after their game closed down. The players, who were at first ostracized in these new spaces, eventually became community leaders, creating hybrid cultures that

integrated aspects from their former game into the new platforms they migrated to.

Lastly, not all games can or should be seen as potential Technology Heirlooms. Briggs and Thomas discuss the importance of systems that can both forgive and forget, proposing that technologies used to support our digital selves should also support the act of forgetting (2014, p. 129). They also state that there are times when a digital legacy seems inappropriate. Perhaps a game containing highly violent or pornographic content is not something a user would want as part of their digital legacy. For this purpose, self-curation can be a better alternative to memorialization. In other words, the user can be responsible for the curation of their own legacy prior to death. Massimi and Charise add that, once deceased, what defines the user in terms of their interactions with technology slips out of their grasp: they no longer have control over what data relating to them continues to be produced after their death (2009, p. 2464). Therefore, self-curation would provide the users with more control over their legacy and the way they wish to be remembered.

8.1 Future Work

The current research has revealed a wide range of contemporary digital death practices that reflect combinations of old and new practices coexisting and/or overlapping in the virtual environments of digital games. However, the dynamic medium of games has the potential to generate new design ideas and research directions. The inclusion of thanatosensitivity in game design processes may lead to the creation of new systems, technologies, and devices that may allow games to accommodate death in their design, supporting the needs of both the deceased and the bereaved.

Games could become heirlooms and be inherited just as commonly as digital files or photographs. They could be used in grief counselling, funerary services, memorials, etc. This is particularly relevant during times of crisis such as the current COVID-19 pandemic, when death is encountered so ubiquitously. Now, games can provide a much needed tool for remembrance, commemoration, and connection with one another. As shown in the case of the *Final Fantasy XVI* (Square Enix,

2013) funeral procession organized by a community of players, games have already started to be employed for this purpose and further research can uncover new forms of practice and perhaps a wholly new genre of games. During the pandemic, games like *Wash Your Hands* (Dean Moynihan, 2020) and *Wear a Mask* (Nic M, 2020) were created to memorialize all the lives lost to the virus and they may offer insights into what a memorial genre could look like and what such a game could entail.

Digital games have simply not existed for long enough to be fully understood in the context of memory, bereavement, and inheritance. Yet, it is my hope that this paper has opened up a new field of discussion relating to how users experience games and how games can be employed not only during our lifetime but perhaps even after.

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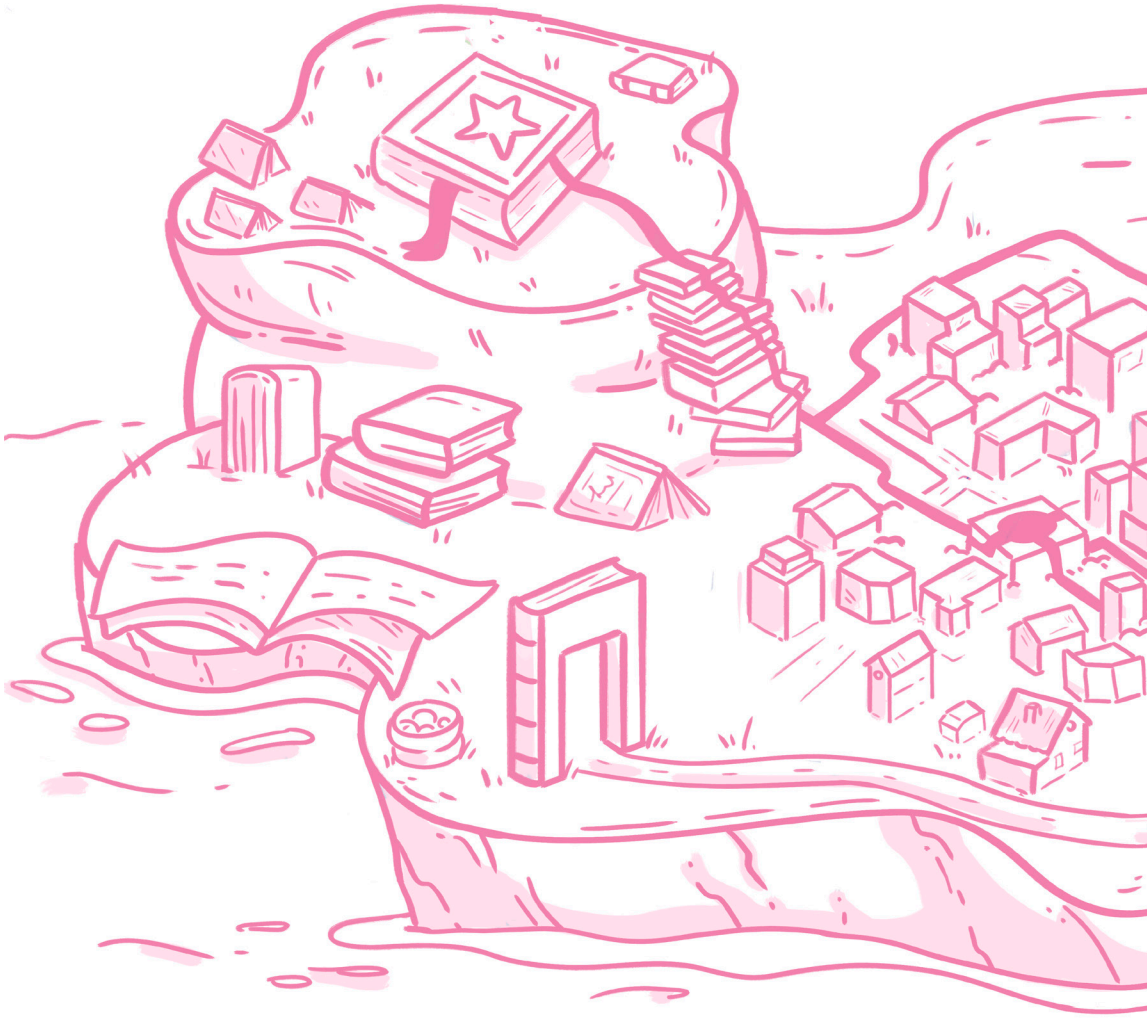

Chapter 13

Retry From Checkpoint: Reflections on Evolving Research

Veronica Johansson

Abstract

Being a junior in any field of research is intimidating, but the truth that is easy to forget is that every experienced researcher started somewhere, at some point, and also makes mistakes. It is easy to look back at your own work and notice things that you could improve, but the understanding of how and why they could be improved can be unclear. When it comes to GRUX in particular, it can sometimes simply come down to the methods that have been used. This chapter explains how two methods, eye-tracking and think-aloud, can be used in an experiment. To do this, the chapter first describes two previous studies conducted for two indie game development studios, where these methods were applied. Finally, the chapter examines a case study of the methods used in my bachelor thesis study, and presents an alternative in which eye-tracking and think-aloud are combined with the previous methods. The aim of the chapter is to introduce junior GRUX researchers to critical thinking in regards to methods used in GRUX studies, and differentiating between method and methodology when planning a GRUX study.

Keywords: Interactable objects, eye-tracking, think-aloud, analysis, GRUX

1. Introduction

Eye-tracking and think-aloud are study methods that may seem intimidating at first glance: what are they used for? What equipment do I need? How do I know if they are viable methods for my study? Asking yourself questions like these before starting a study is great: if you want to design a study with higher validity and reliability, you have to evaluate the methods you are planning to use. GRUX methods should be evaluated for their capability to provide data that is not only accurate, but also immediately actionable for developers, companies etc. It is also important to evaluate if the methods are the easiest way to gather said data. Additionally, there is a difference between method and methodology. Business ethics scholar Lisa Slevitch (2011) explains that when evaluating a *method*, you evaluate a tool or a study structure. *Methodology*, on the other hand, is the justification of using a method based on your pre-established standpoint on the topic (Slevitch, 2011).

I have always been passionate about video-game graphics. During my time as a video game developer, something that has stuck in my mind is the effect that particular visual elements can have on a game's design. In the spring of 2020, before I started my GRUX education, I and two other students at the University of Skövde wrote a bachelor's thesis called *Interactable objects in games* – an attempt to answer the question of "Is saliency or association most important when choosing colors on interactable objects in a game-environment inspired by the fantasy-genre?" Saliency is – in the context of the thesis – the prominence of a certain color, while the associations refer to what people connect to the color (e.g. feelings, objects, memories etc.). To answer the question, the methods used were a *demographic survey,* a *playtesting session* of a prototype game, and a *semi-structured interview*. The purpose of the study was to create guidelines for artists and designers in game development regarding stylistic choices of interactable objects, and to highlight the importance of color choices. The first issue with the study was that it is impossible to determine where the participant looks on the screen with the methods used, which would be solved by using eye-tracking. The methods used, specifically the interview, does not have a high enough validity. There is no proof that what the participant answered in the interview correlates to what they were thinking in the moment. Think-aloud was chosen to solve this issue, since the concept

of think-aloud is to investigate problem-solving and decision-making in the moment of the action.

This chapter gives a short overview of eye-tracking and think-aloud methods in the context of my recent GRUX research and evaluates my bachelor's level study to think about how it could be improved if it was remade today with these methods in mind. Both methods are commonly used among GRUX junior researchers and by game development studios, and learning about them is a good start when entering the GRUX field. The aim of this chapter is to de-mystify eye-tracking and think-aloud as research methods, and the purpose is to give guidance to junior GRUX researchers regarding choosing methods, and to highlight that critically analyzing your own work is crucial to evolve as a GRUX researcher.

2. Eye-tracking

UX – and by extension, GRUX – is a part of the HCI field, where eye-trackers are commonly used to study usability, particularly of screen-based instructions. An eye-tracker is a piece of equipment that records the eye's movements and is used both in qualitative and quantitative studies. Aga Bojko's book *Eye Tracking the User Experience: A Practical Guide to Research* (2013) is a good start for researching eye-tracking – granted that you already have some knowledge of UX testing. The book takes a stand against the "track now, think later" mindset, and encourages researchers to evaluate a method thoroughly before applying it to a study. Bojko explains most of the things that a researcher needs to know about what the tool measures in relation to the eyes: for example, while the eye can cover a certain field, only the center is clear, while the rest of the field of vision is blurry. However, subtle eye movements, called saccades, can allow the eye to focus on several areas, making it appear as though everything in the field of vision is clear (Bojko, 2013, pp.10-12).

Alex Poole and Linden Ball (2006) dive deeper into what eye-trackers measure, and explain that an eye-tracker mainly measures *fixations* and *saccades*. Fixations are moments when the eye focuses on something and takes in information about that thing. Fixation occurs when something catches the attention of the eye, and is often measured by

frequency, how often the attention is caught, and *duration*, for how long the attention is caught. The reason for measuring fixations is to understand more about the processing that is being applied to an object, by revealing how long it takes to process that object. Fixations can also be used to measure interest, but are mostly indicative of uncertainty in recognizing an object (Poole & Ball 2006, pp.5-7).

Bojko highlights that eye-trackers are easy to use as a tool, but identifying what to use it for is more challenging. To evaluate the usability of eye-tracking for a study, there are three types of questions to ask, where two of them are especially interesting for this chapter: will the data gathered have significance for the study, and is it the most efficient method to gather this data? (Bojko, 2013, pp.22-23).

Figure 1. A display frame from Exploring color preference through eye tracking (Lee et al., 2005), showing one type of object in 8 different colors.

An example of a study where eye-tracking is used was made by Lee, Tang and Tsai, called *Exploring color preference through eye tracking* (2005). In their study, the participant was exposed to images of 7 kinds of objects on a screen, which were represented 8 times in 8 different colors (the colors in question were red, green, blue and 5 additional colors). For each display frame, there were 8 images of the same object, each in one of the colors (see Figure 1). The purpose of the study was to analyze the relationship between color preference and eye movements, measured in fixation counts, fixation duration and return of fixation. The data collection method was a combination of eye-tracking, to gather data regarding the eye movements, and letting the participant rank colors according to their preference (Lee et al., 2005). The authors justify the use of eye-tracking by suggesting that the move-

ments of the eye are more objective than survey measurements, which have been used in previous research for investigating color preferences, and that the movements are difficult to falsify. This is a feasible claim, since eye-movements can be conscious and unconscious. As explained by Bojko, eye movements are influenced by two things: *top-down attention* (things you decide to look at, based on experiences, knowledge, preference etc.) and *bottom-up* attention (things that catch your attention) (Bojko, 2013, p.14). Lee et al. take this into account by explaining that there are certain factors that affect attentiveness in a person when viewing colors: conspicuous external stimuli (bottom-up) and the subject's internal processes (top-down). The external stimuli was controlled by randomizing the positions of the colors for every object, and by showing every object set for 5 seconds each (Lee et al., 2005).

Another example of what areas eye-tracking can be used to examine is a study created by games researcher Charlene Jennett et al. (2008), where the basis of their second experiment is the hypothesis that a player will show measurable change in eye movements as they become more immersed. To test this, they conducted an experiment where the participant performed either a non-immersive task or an immersive task coupled with a post-playtest survey to measure how immersed the player felt during the experience. The non-immersive task was a simple digital game where the player clicks on a square that disappears and then reappears in a different location of the screen, while the immersive task had the participant play through the "hazard training course" in *Half-Life* (1998). Jennett et al. measured the immersion of the games through one experiment where they compared the difficulty the participants had when switching between playing one of the digital games and doing an off-screen task. It was also measured through having the participant self-report on their immersion level in the post-survey. The eye-tracking was first used in the second experiment of the study, where the two main hypotheses were that participants who played the immersive game would have a different number of fixations while playing compared to the participants playing the non-immersive game, and that the self-reported immersion levels would correlate to the fixation differences. Both of these hypotheses were supported by the results: the participants who played the non-immersive game had greater variations in fixations over time, while the eye movements of participants who played the immersive game decreased over time. The

eye movement also correlated to the self-reported immersion to some extent. For Jennett et al. the main takeaway from using eye-tracking is that the recorded footage was useful for determining player attitudes: for example, participants who were particularly curious about the game – a conclusion that could be drawn due to the self-reported high immersion level of the participant – looked around more on the screen at the start of the game than those who were not (Jennett et al., 2008). For this experiment, the eye-tracking would have been difficult to draw conclusions from if not for the post-playtest survey. The study used eye-tracking to strengthen the questionnaire method, to be able to relate the qualitative measuring (participants' subjective opinions) to quantitative measuring (fixation data from eye-tracking), to heighten the validity of the method. Going back to Bojko's (2013, pp.22-23) questions about using eye-tracking, there is an evaluation to be made: did the measuring of fixations contribute to their previously gathered data, and to their study overall? The answer is yes: the researchers were exploring different ways to measure immersion in digital games, and specifically mentioned that eye movements provide information about a person's attention and intention, which is highly connected to immersion and interest in a game. Is it the simplest method to gather this data? It depends. To determine the immersion of a game, the questionnaire method would have sufficed. However, to specifically observe and analyze the human gaze, which is something that the authors stated is important in understanding the attentiveness of a player, using eye-tracking is a necessity.

2.1 My experience

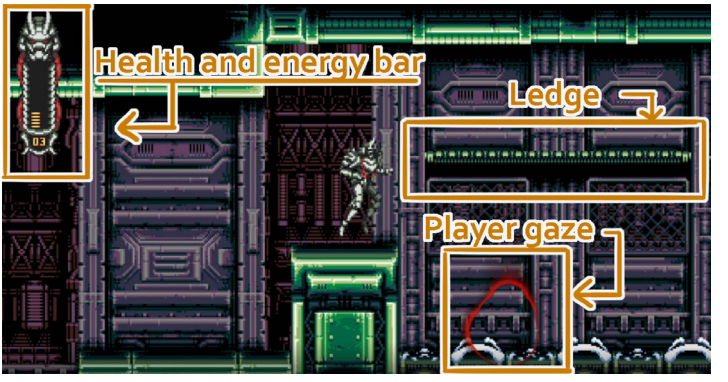

Figure 2. A screenshot from the eye-tracking recording displaying JoyMasher's project. The health and energy UI and the ledge that the player was supposed to grab went unnoticed.

I was first introduced to eye-tracking after starting my GRUX M.Sc. education. In one of the courses, three peers and I were tasked with doing user experience testing for an indie game developer studio called JoyMasher. JoyMasher asked us to conduct testing for a game that is still unreleased at the time this chapter is written. The game was a 2D action platformer in a very early stage of development (see Figure 2), and the studio was interested in knowing as much as possible about how players experienced the game, including difficulty and the effectiveness of the UI. For the testing, we decided to use eye-tracking, think-aloud, interviews and observations as the methods. The reasoning behind using eye-tracking in this case was that a platformer relies on the player knowing where they can jump, what they need to avoid, as well as the player's ability to find obstacles. The studio was also interested in identifying if the UI elements were something that caught the players' attention. With the game being similar to older arcade games in art style and gameplay, the studio also wanted to know how players who do not have experience with older arcade games perceive the game.

The use of eye-tracking for this study was mostly experimental in nature. While we could get a lot of data regarding areas of interest from simply listening to what the player says, we wanted to make sure that there was not a disconnection between what the players remembered seeing versus what they actually saw, and our suggestion to solving this was to use eye-tracking – mostly because we knew beforehand that it was an option we had access to. The cost of an eye-tracker was not an issue in this case, since the university provided a Tobii eye-tracker for the study. The set-up was also very easy to do – the eye-tracker was placed beneath the screen that the participants used to play the game, and the software used to record was OBS, which is free as well.

The process was very simple, quite cheap, and very effective. An obvious issue that was found when analyzing the results was the fact that the players did not notice nor understand the health and energy HUD element until after they had died in the game a few times. This finding was supported through the eye-tracking data – the players did not typically look at the health and energy UI. The eye-tracking data also confirmed that certain ledges that the player could attach to went unnoticed by the player, possibly because the graphics were not visible

enough in comparison to the background (see Figure 1). The eye-tracking data was also used to identify more confusing or difficult areas of the game in general.

Was eye-tracking the right choice for this study? It was a simple method to gather usability data, the equipment could in this case be used for free (even if was not, there are cheap alternatives), and the software created data that was fairly easy and time efficient to analyze due to only having some participants participate in the eye-tracking. In summary, the method is not as difficult to use as one would expect, and the data gathered can be used to support observation and interview results. Once again, we return to Bojko's (2013, pp.22-23) questions: will the data gathered have significance for the study and is it the simplest method to gather this data? In this case, significant data meant data that could be used to strengthen the observations, or find issues that the observations could not. Most of the eye-tracking data was unutilized, but we did manage to strengthen our observation and interview results. Overall, the answer to the first question is probably a no. During the testing, we unofficially used think-aloud as a method by having a limited discussion with the participants while observing them playing the game. The observations became our main source of useful data, so for the second question, the answer is a maybe: it would have been easier to define think-aloud as a method for the study, and base our conclusions on that instead. For this study, we potentially fell for what Pagulayan et al. describe as "the lure of biometrics": biometric data looks important, leading researchers to sometimes skip the evaluation of if the method in question is relevant to their study (Pagulayan et al., 2018, pp.336-344). However, one method does not have to exclude the other: for triangulation purposes, think-aloud combined with eye-tracking worked well. The conclusion from this study in regards to the methods used is that we should have taken a step back to think about and research what kind of data eye-tracking can provide, and how that data would fit in our study, before applying the method. The greatest issue in the planning was understanding how to use the eye-tracking data, rather than why to use eye-tracking: the method worked well, but we did not know how to use the data effectively. The study did however become an introduction to eye-tracking for me, and an incentive to dive deeper into the usefulness of eye-tracking.

3. Think-aloud

A common practice in GRUX and UX research in general is the think-aloud method. Think-aloud is a qualitative method – a method that, according to Slevitch (2011), is based on the standpoint that there is no universal explanation to the phenomena you are looking at, but rather that the understanding of the phenomena is found within different perceptions of people. During interviews, the risk of errors when having the participant recollect previous events is fairly high. As explained by Maarten van Someren et al. (1994), think-aloud can be used to understand the cognitive process of a person who is performing a task rather than having them try to explain it outside of the situation (Van Someren et al., 1994). According to Koro-Ljungberg et al. (2013), think-aloud enables real time data collecting, and mainly has the purpose of adding insights and a different perspective to more traditional, delayed methods for data gathering. The data is also "unfiltered" – participants' are less prone to adjusting their responses when voicing their momentary thoughts. These responses become a mix of experiences, reflections, etc., making them less linear. However, one weakness with think-aloud is that the understanding of the responses can be limited. There can be gaps in, or a complete lack of, justifications and reasoning during think-aloud processes from the participant (Koro-Ljungberg et al., 2013). The point of think-aloud is to observe how a participant interprets information, and can be used both concurrently, by observing a subject, and retrospectively, by video-taping the session and letting the subject comment on the footage, but for this chapter the concurrent version is most relevant.

Lundgrén-Laine and Salanterä (2010) explores the use of think-aloud to analyze decision-making processes in health care. An issue with think-aloud that the authors mention is that professionals typically are not used to voicing their thought processes when working, neither being recorded while doing so (Lundgrén-Laine & Salanterä, 2010, p.569). The same goes for a game setting as well – a player would not typically voice their thought process when interacting with an object in a game, neither would their play-session be recorded, unless the player is in the habit of streaming or the like. Lundgrén-Laine and Salanterä suggest pre-study exercises for vocalizing the thought process, but explain that there are no detailed guidelines for such exercises in previous

literature (Lundgrén-Laine and Salanterä, 2010, p.569).

The reasoning for using think-aloud in GRUX, according to Hong and Liu (2003), is that problem-solving and decision-making are both strongly connected to games, regardless of whether or not the games in question have the specific purpose to develop these skills – but a player does not typically explain what they are doing in a game after they do it. Think-aloud is also typically used for usability testing in the HCI field, and is efficient in regards of the number of participants needed – about five participants are enough to identify most issues in a digital product's design (Nielsen et al., 2002). This number is based on a study by Jakob Nielsen (1994), where the result showed that 77-85% of the usability issues of a particular user interface was found with five test subjects involved (Nielsen, 1994).

3.1 My experience

At the same time that our group of four students conducted testing for JoyMasher, we also conducted testing for another indie game development studio called PocApp. PocApp specializes in mobile games mostly aimed at younger audiences, and our task was to test the tutorial of what was at the time a recently released title, called Dungeon Dogs (2020). To do this, we used think-aloud, observations and interviews. The testing was conducted at two separate locations: one at the University of Skövde, and one at a youth recreational center. At the university the participants consisted of students, and at the youth recreational center, the participants consisted mostly of children around age 12. For the university testing, the setting was in a specifically designed lab, making it a bit difficult to get the participants to think-aloud due to the unnatural setting. However, several participants had previous experience with think-aloud during testing, and we were able to get valuable data from them, in addition to data from the interviews and observations.

During the testing with the children, there were some advantages for a think-aloud method: the location was familiar to the participants, and they were allowed to play the game next to each other. This resulted in some of the participants having an easier time with speaking freely and honestly without being prompted to do so, and we were able to

observe how the game would be experienced in its natural setting.

One of the greatest takeaways from this experience is that the setting of the testing session is important to take into consideration when using think-aloud as a method, but also for games user experience testing in general – is it important that you can observe how players interact with the game in the setting that it was intended for? To test the experience part of GUX (in contrast to usability), the answer is likely yes, it is important.

4. A practical application of the methods

My bachelor's thesis, *Interactable objects in games* (Bergman et.al, 2020) describes a study regarding colors on interactable objects in digital games. The purpose of the study was to answer a question regarding colors in digital games: "Is saliency or association most important when choosing colors on interactable objects in a game-environment inspired by the fantasy-genre?" As previously mentioned, saliency is defined as how well something catches the attention of the eye, and how well it keeps the eye's focus. Regarding associations for colors, Elliot and Maier (2007) explain that all visual stimuli humans experience has some kind of color information, unless there is a visual condition preventing it, and that experiences create associations between colors and for example feelings (Elliot & Maier, 2007). Associations affect the human brain in many ways, actions and behavior included, and can be specific in different contexts, in this case, games. According to the evaluation of Heads-Up Displays's (HUD) for different games by Zammitto (2008), color-coding is often used to signify certain things, like in Half Life 2 (2004) in which decreasing health is signified by red, based on the notion that red means danger in western cultures (Zammitto, 2008). We decided to specify the game genre to fantasy, rather than just digital games in general, to be able to separate real life color associations and the color associations of the digital world. Fantasy games typically have certain elements connected to different colors, like blue with mana or magic and green with either poison or healing.

To summarize, the study consisted of three parts – a survey, a game prototype (see Figure 3-4) and a semi-structured interview. The survey was demographic, asking the participant about age, gender and gam-

ing habits. The reasoning behind using a demographic survey was to look for correlations between demographic information and interview/observation data. The interview was used to gather data about associations, and was to some extent modified by the events of the play session, and contained questions such as:

- "What color did you choose in Room 1 and why?" (see Figure 4)
- "What do you associate the color red to?"
- "What do you associate the color red to in a fantasy setting?"

In general, it was a simple study to conduct, with the survey being created in Google Forms and the play session and interview being held mostly online – with the prototype excluded, the study was efficient both from an economic and time management perspective.

Figure 3. A screenshot from the written instructions of the prototype fantasy game. The image features the player character and the secondary protagonist.

Figure 4. A screenshot from the first decision-making area of the prototype fantasy game. The image features the player character in front of three crystals colored blue, red and green respectively.

To be able to gather data related to the fantasy game setting in question, a prototype game was created to simulate a "real" fantasy game experience. The game starts with a 2D cutscene that explains the narrative, and then written instructions explaining the reasoning for picking up items and the rules of the game: the player can only pick one item for every area (see Figure 3). The game continues by putting the player in a 3D starting area, where they proceed to move to the first decision-making area (see Figure 4). There are five decision-making areas in total, with different object sets for every room. The player chooses the color by walking up to the object and pressing "E" to interact. We decided to make the prototype have high fidelity to be able to examine how players make decisions in a natural gaming setting – which made us include start and ending cutscenes to give the player a sense of fulfillment and motivation to perform the tasks, and graphics in a cartoony art style to further separate the digital world from the real world.

The problem is, however, that the data was neither particularly reliable nor valid. It was impossible to determine if a participant's eyes had been drawn to a certain color, which means that it was also impossible to determine the effect of saliency on a participant's decisions. The only way of measuring saliency was determining if a participant's answer indicated the phenomena. There was also no proof suggesting that associations had the most influence in the choice, since the interview specifically asked for associations, which could have caused the participant to name a reasoning for picking a color regardless of if that was truly what they were thinking at the moment. The question at hand is how to construct a study that solves this issue, and how to avoid these issues in the first place.

4.1 Method and methodology

Interactable objects in games (Bergman et al., 2020) aimed to analyze how saliency and associations affect what choices the player makes. The approach that colors do affect choices is based on previous theories about color associations, for example that red in many cultures signifies danger. In *The Color Revolution* (2012), Regina Lee Blaszczyk discusses how suddenly, during the early 20th century, the functionality of colors became an important topic in product design: in the military, colors were used to hide soldiers and weapons; in the office,

colors were used to create an environment more befitting for efficiency. If colors have particular functionality for different areas, it begs the question: for interactable objects in video-games, what are we really looking for? The color that catches attention, the preferred color of the target audience, or something else?

Methodologically, the study did not hypothesize that either saliency or associations would be more or less effective for capturing the attention of the participant, making the study to a great extent qualitative in nature. It did, however, establish that attention was a key factor for decision-making in regards to graphical elements in a game, and aimed to find a more general answer to the question, making the study overall both qualitative and quantitative.

4.1.1 Eye-tracker

For *Interactable objects in games* (Bergman et al., 2020), the focus was attention, and the study compared saliency versus associations, yet the validity of the data gathered regarding saliency is questionable. The basis for measuring if the choice was affected by saliency was simply relying on if the participant failed to mention a particular association, if their answer indicated the effect of saliency, and the time spent when making the choice. Saliency is defined as the prominence of something, how well it captures the attention of the eye and how long it can keep the attention. This definition is directly connected to how eye movement is typically measured, as explained by Lee et al.: by fixation counts, fixation duration and return of fixation (Lee et al., 2005).

To actually gather relevant data when measuring saliency, using eye-tracking is a necessity. Referencing the questions that Bojko (2013) suggested, the data would be significant to the study due to the fact that eye-tracking measures fixations of the eye, related to saliency, and given the accessibility of the tool, it would be the simplest method to gather the data, but most of all, it is a method that brings validity to this type of study. However, the use of eye-tracking would have changed the nature of the study severely. An eye-tracker must be provided by the researchers, requiring the experiment to be conducted either in a lab setting or in the participant's home. The study as it is was conduct-

ed mostly online, which bars the possibility of using physical tools. To use a physical eye-tracking tool, the study would have needed to be conducted face-to-face instead.

An issue when prompting a participant to answer why they made a certain decision is that the question itself can affect the answer. The participant can unconsciously construct a seemingly more logical reasoning regardless of what their reasoning was at the moment simply because they are asked. Hence, the use of eye-tracker is once again justified: if a clear fixation can be identified, it can be used to oppose or strengthen the reasoning. However, it cannot be used to prove whether the reasoning came later or not, but it can give some clarity to the mindset the participant had at the moment of the decision.

4.1.2 Think-aloud

To identify what the participant's thought process looked like at the time of the decision-making, think-aloud is a possible method. As previously explained by van Someren et al. (1994), think-aloud is used to document thoughts that are relevant to the moment of an action. If a think-aloud method had been used in *Interactable objects in games* (2020), the data collected could have been used as a comparison to the delayed explanations that the interview provides, and determine the reliability of these explanations. For example, if a participant at the moment of the decision mentioned that the color was "bright", but later gives a different explanation, the conclusion would be that the participant chose the object because of the saliency of the color. If similar words were used both during the decision-making and when later prompted to explain the thought process, the think-aloud data would prove that the explanation provided would indeed be the reasoning behind the choice.

However, Lundgrén-Laine and Salanterä mention a detail about the sampling of participants – a participant's verbalization skills and the ability to use those skills when thinking aloud could be critical for the validity of the data gathered (Lundgrén-Laine and Salanterä, 2010). In a game setting, a participant's game literacy should be considered – an element that *Interactable objects in games* (2020) handled by letting the participants answer a demographic survey, containing questions

about gaming habits. From this, the study showed that participants who played 20+ hours/week had a tendency to choose based on patterns, which is one of the most interesting conclusions the study provides, due to the possibility that the participants with significant experience of video games based their patternmaking on previous knowledge: there are many games that requires the player to gather items of the same color. From this result of our study, we can draw the conclusion that some type of association overrides the saliency of the color. The sampling was consciously based on having participants who had at least some experience with games, but other than that, the amount of experience was mostly overlooked. If think-aloud had been used, the sampling process would have taken into account the participants ability to use think-aloud, which could have been determined by having a think-aloud exercise prior to the testing.

4.2 Old Study, New Approach

Now that some of the major cases for these methods have been identified, the question is how to implement them. What follows is a description of a suggested experimental workflow that could have been used for the *Interactable objects in games* (Bergman et al., 2020) study, in which the previously explained methods of eye-tracking and think-aloud are applied.

To use the suggested methods, the experiment would need to be conducted in person. What follows is an example of what a protocol for a revised experiment could look like:

- **Conduct a think-aloud pre-study exercise, where the participant is asked to solve some type of problem while explaining their thought process**
- **Explain the mechanics of the game, if there is no tutorial**
  - This is to ensure that the mechanics do not cause confusion, which could affect the results.
- **Encourage the participant to think-aloud**
  - Record video or audio for later analysis.
- **Setup the participant to use an eye-tracker while playing the game**

- **After the play session, an interview is held**
  - The data gathered from the interview and the eye-tracker will be compared in the analysis.

To start, the protocol mentions explaining the mechanics of the game due to the lack of a tutorial. This point can be very relevant for prototype games in general, since a prototype is typically not a complete game. It can also be useful if the interest lies in testing a certain part of a commercial game that does not include a tutorial. The point of this is to make sure that the participant does not get distracted or confused regarding the mechanics – unless that is exactly what you are testing, of course.

The second point is encouraging the participant to think-aloud. As previously mentioned by Lundgrén-Laine & Salanterä, voicing thought processes is not always a natural reaction, especially not for people who are professionals, or particularly familiar with the task (Lundgrén-Laine & Salanterä, 2010). The researcher might have to prompt the participant several times during the testing, unless the sampling has been purposefully made to only include participants who are experienced in vocalizing their thoughts.

For point three in the protocol, the play-session is conducted using eye-tracking. If there is no data managing software available, make sure that there is footage from the eye-tracker that can be analyzed later, for example by using Tobii Ghost.

The last point is the interview. Typically an interview or a survey is used to explain eye-tracking data, however, the connection between the methods is adaptable – in this study the eye-tracking would be used to analyze the validity of the data from the interview. Kvale (2008) explains that an important truth regarding interviews is that the gathered data depends heavily on the social relationship between the researcher and the participant, and the social abilities the researcher has to create a setting where the participant can freely express their thoughts and feelings. In an interview – or in any kind of study – the researcher cannot be completely detached from the study – they have to give something to gain the openness of the other person, as in a typical conversation about a person's beliefs (Kvale, 2008). This issue

in objectivity by the researcher is something that must be taken into account, and the researcher must be able to recognize in what ways the subjectivity in their study is represented to create a valid study.

In general, the changes suggested here are mostly easy to achieve, but they would make a great difference for the results. The use of an eye-tracker makes the study impossible to execute online, causing the experiment to be conducted in person. But the eye-tracker brings a validity to the study that mere observations cannot provide: it is impossible to determine the saliency of a color by simply observing gameplay, but with the added eye-tracking data, eye movements can be studied. It is likewise impossible to determine the reliability of the reasoning behind a choice by asking a participant to answer a question after the decision was made, but if the participant is encouraged to – and does – think-aloud, the researcher can determine reasoning at the moment of the decision.

While the experiment and the prototype were made to analyze a particular graphical element in game design, this type of experiment could have been used during the development of a commercial game. The method could have been mostly the same, even though the prototype would be different, and could be used to determine if the graphical assets made with a specific function in mind are working as expected: for example, if a game uses color in the level design to guide the player, several prototypes with one or two maps, where the color varies, could be used to determine what color is the most effective. However, the interview would require different questions, and perhaps contain questions about the preferences and associations the target audience has.

5. Conclusion

The new approach is just an example of what an experiment could look like – but why is this case study interesting for you? While my focus was colors, your focus might be something very different.

These methods will not be the most useful or effective ways to answer every question a game developer might have, but they can be a solid foundation for several types of studies. An eye-tracker can gather data about visuals, for example: how to use graphics to provide information

and guide people, including color, shape and light; testing how different people react and navigate depending on visual cues; or, figure out where people look when searching for a feature. Think-aloud can give insight to a participant's thought processes, and is useful for answering many different questions a developer might have. Together, these two methods can complement each other: eye-tracking can be used to explain non-verbalized thought processes, while think-aloud can explain why a participant's attention was caught. The usefulness of the methods can also be examined by efficiency and what they can be used for, but also why to use them based on your own standpoint on the topic at hand, or on the details of the research question.

This type of study is not to evaluate an already released game – it can be used during development, to examine a prototype or a beta version of a game. Depending on what you are looking for, you can use these methods in different ways – eye-tracking can for example be used when trying a level to see if the player fails to notice something of importance. If you want to know how players solve a puzzle in your game, you can use think-aloud. Just as easily, they can be combined. The methods are easy to use and combine with each other and other methods, and are efficient in their respective areas.

The main difference between working in an academic setting (my bachelor's) and in an industrial setting (JoyMasher and PocApp) was the goal of the study: for the academic research, the purpose was to examine a phenomena and help build a base for future research on a specific topic, mainly for other researchers; for the industrial research, it was a matter of evaluating a released or in development game for the studios themselves, so that they can improve their products. The industry work gave me insight into how GRUX works in the industrial setting it was intended for. As mentioned by Engström in *Game Development Research* (2020, p.8-11), there is a significant gap between games researchers and game development: games researchers typically lack game development experience, and game developers do not typically see the need of conducting research (Engström 2020). The fact that the two students and I who conducted the bachelor's level study had some experience in video game development allowed us to make a high fidelity prototype to test, which worked in our favor – the game setting was believable, and we managed to capture the fantasy

theme. For the industrial work, there was not a defined research question that needed to be answered: for JoyMasher, they wanted as much information as possible, from usability to user experience; for PocApp, they wanted an evaluation of the tutorial of their game. The solution we provided was putting the players in an environment where they could freely play the game or the tutorial level while we observed – which is sometimes the most viable choice for testing user experience. Other methods can be added depending on what you are looking for, but a good base for user testing is, from my experience, simply letting the participant play the game in a natural setting, as the product was intended to be used.

For me, I plan to take this knowledge with me both in my final year as a GRUX student, and into my future endeavors in video game development – I would like to cross the gap between being a developer and a researcher. I am specifically interested in doing so for game art, because there is still a lot to be studied in graphics – for example, the readability of Graphical User Interfaces, and the fluctuating trend of players preferring realistic graphics over cartoon styled graphics, and vice-versa. I also believe that evaluating products through user testing before releasing them has to be incorporated into game development even more than it is today – time and time again digital games are released to the public in an unfinished state, like for example Cyberpunk 2077 (2020), or end up being a disappointment to the audience due to miscommunication between the developers and the players, like No Man's Sky (2016). Publishers and developers, as well as the players themselves, set high expectations for games that they are passionate about, and I believe that user testing is crucial to be able to live up to those expectations.

Regardless of whether or not you consider yourself a developer or a researcher, the fact still stands that it is easy to look back at your work and discover things that you could have done better. But that is to some extent why we do GRUX studies – to prevent mistakes from being made, and help others make the right decisions. If you are interested in something, regardless of if you want to put an idea to the test, or if you simply want to see how other people use a product or react to a phenomena, do not be afraid to try it. You might succeed or you might fail, but you will always gain something from the experience – it is never time lost.

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Chapter 14

Intergenerational Research on Chinese Attitudes Towards Games

Weijia Huo

Abstract

As a child born in China in the late 90s, I have witnessed how games have started establishing themselves in China, step by step, throughout the 2000s. However, China stands apart from other parts of the gaming world, in that it the establishment of new things such as game thinking and the market conflicts with traditional Chinese ways of thinking, and this conflict has led to different ideas between the older generation and the young. So, some parents of my generation, and older generations cannot understand the enthusiasm of modern young people for games, and some people even think that games are harmful.

There are also cases where parents prevent their children from playing games for various reasons, and the occurrence of this situation is often not mild or a consensus. So, what are the reasons for this common cultural phenomenon?

These attitudes towards games can be connected to China's historical development over many centuries, not just in this millennia. The conflict between the young and the elders about the concept of game comes from the guidance of the government, the influence of traditional culture or the lack of communication between parents and children, or in fact, all of these are the reasons for the different concepts of the two generations.

Keywords: Chinese parents; Game; Attitude; Differences; Concept

1. Introduction

In recent years, Chinese game industry and game market have developed rapidly. Although casual online games began to appear in China in the late 1990s, massively multiplayer online games (MMOGs) made their real breakthrough in 2001. Since then, the Chinese online game industry has been growing rapidly, and it is estimated that in 2006 it generated revenues of 6.5 billion ren min bi (RMB), with 31 million users (IDC, 2007). The number of adolescents using the Internet has increased from 120 million in 2002 to 195 million in 2010 (China Internet Network Information Center (CNNIC), 2011b).

I myself grew up when computers and the Internet began to spread in China, so I experienced the entire process of Chinese game development. In my opinion, the development of Chinese games from online games to mobile games has its own characteristics, that differ from other culture contents. However, in the Chinese context, the older generation in China (mainly people born before 1980) do not support games or their children playing games, and can even be said to be resistant and opposed.

Here I want to examine what caused this phenomenon. Given my background, I can provide intimate insights on the topic, which may at times be personal in nature.

Due to the development of the times, the new generation of parents today do not have such serious negative thoughts about games. Therefore, this can also be said to be a historical study of "the views on games".

2. Chinese traditional culture and thoughts

In this section, readers will understand the influence/function of traditional culture and philosophical environment on the game concept in China.

China is a country with an extremely long history. From the development of the Mesopotamia to the present, it has been iteratively updated for thousands of years. In these thousands of years, many people have

put forward their own theoretical ideas. Among them, the controversy of a hundred schools of thought was the most prosperous during the Spring and Autumn Period and Warring States Period (BC770 - BC221). Among them was the most influential Confucian school later on.

2.1 Discussion of some common phenomena

Due to the long tradition and prevalence of Confucianism thought, many older generations hope that their children can follow their own ideas and spend their time on things that improve themselves or bring benefits to society, but they are not exactly the same as the ideas of most young people in modern times. In fact, due to the high-speed and high-pressure working environment formed by the rapid development of China in recent years, many young people prefer to spend as much time as possible to enjoy life, and games are a big part of the entertainment in life for many people. Whether it is building a country or enjoying life, there is nothing wrong with the concepts of the two generations, however, the older generations often just can see the time when the young people resting at home, they feel that their children doing nothing, and wasting time on meaningless things. They do not understand the seemingly "not actively pursuing" attitude of young people, and hope that the younger generation can spend more time on studying and improving. So, they attribute the cause to the game. They claim that playing games will deprive people of their will. To warn children to stay away from games.

Under such a cultural background, some more conservative parents will manage things that they think will waste their children's time or affect their children. For example, some parents will confiscate the game console or prohibit the child from continue playing due to what they consider to be excessive play. In many cases, due to the "autocracy" of their parents, children cannot communicate with their parents, and passively compromise. In fact, this does not prove that children can work as actively as their parents want: without games. But what's interesting is that the opposite is true. Parents can't control their children's "wasting of time," nor can they really control the right to use games/entertainment. What they don't know is that children have infinite wisdom to find out the game consoles they hide. Or crack the password of a computer. At this time, teenagers are always smart as detectives.

But in fact, games are only one of the ways for children to "waste time," but in the eyes of many parents, it is the main way. Children who really want to waste time can daze in the room for hours even if they don't have a game console.

2.2 Confucianism

While Chinese parents expect their children to bring their families and society the contribution, they also want their children to internalize the longstanding Chinese value of obedience to parents, teachers, elders, employers, and the state (Fong, V.L, 2007). This value has its root in Confucianism which has had a profound influence on the Chinese people. Confucianism is a philosophy that emerged from literature during the Spring and Autumn Period and Warring States Period (770 BC-221 BC), but did not garner appreciated and spread until later. In the Han Dynasty, Emperor Wu (156 BC-87 BC) chose Confucianism and promoted it in order to better unify his citizens. "The civil service exams that structured the education of the elite in imperial China were based primarily on state interpretations of Confucianism that emphasized the importance of the San gang (Three Bonds): analogous hierarchical relationships in which subjects must obey rulers, sons must obey fathers, and wives must obey husbands" (De Bary and Chaffee 1989).

This theory is contrary to the current values of equality and respect, but it was indeed a good method used to assist the emperor in ruling the people at that time. However, in the process of searching for information, there are no, or at least few, official public discussions on whether the views of "San gang (Three Bonds)" are problematic, wrong, or outdated. On the other hand, in recent years, more critical education has been promoted, and most young people today are educated on the value of equality. The growing interest in these more modern values, and its stark contrast to traditionally held values, leads to a generational gap between people of different ages on a philosophical level.

2.3 The influence of "traditional filial piety"

"Among hundreds of virtues, filial piety is the most important one" (bai shan xiao wei xian, a traditional Chinese proverb). "This widespread

traditional saying indicates that filial piety (xiao) is the prime guiding principle of socialization" (Ho, 1981) and is "strongly emphasized in Chinese culture" (Yang, 1981). "In China, it is a culturally embedded persuasive force used by parents to shape the values, attitudes, and behaviors of their children" (Liu, 2008). The ties between Chinese families are always very close. Parents constantly want to help or intervene in their children's affairs, pave the way for their children, and decide their way forward. And children were taught to be filial to their parents since they were young. In ancient Chinese cultural concepts, it has always been considered that children could not even refute their parents' orders, otherwise they would be called unfilial. This kind of strict filial piety is called "foolish filial piety" by the public today. Of course, with the increasing openness of society, the phenomenon of foolish filial piety no longer conforms to the values of modern society. At least it is rejected by the majority of people, and it's gradually becoming a product eliminated by social progress.

Yeh and Bedford proposed a more comprehensive model of filial piety in the article *A test of the dual filial piety model* (2003), which is a dual concept composed of two factors: "reciprocity and authoritarianism." Reciprocity comes from the content of "filial piety" itself, which includes children Out of gratitude and repayment for the kindness of the parents' birth and nurturing, children are encouraged to provide protection for their parents' lives as their parents' support and care when they are old. This is a kind of biphasic pay and gain, and it is the most basic form of long-term existence between Chinese families. Authoritarianism pays more attention to the class relationship between upper and lower, which tends to aggravate the existence of control. This is because children's lives and bodies come from their parents, and their parents' social experience and financial ability are superior to their children in the early stages. Therefore, in terms of authoritarianism, children must obey their arrangements and follow their wishes. This is also the reason why parents have long been accustomed to controlling their children's behavior. Even if the autocracy between parents and children in modern times is not as serious as in ancient times, some parents still rely on their rich social experience and decide to give orders to their children's behavior (Wang, Laidlaw, Power & Shen, 2009). Based on an in-depth interview with 50 elderly Chinese people living in Hong Kong, Ng and colleagues (2002) observed that although

some adult children do respect and agree to their parents' arrangements, they may not really follow their parents' arranged actions, they just verbally agreed, these promises are sometimes like a placebo for parents, then they still follow their own ideas and actions.

In many cases, kids will be obstructed by the moral constraints of "filial piety" and have to force themselves to do some accommodating behaviors. And before they do this, it is very likely that they will not communicate their thoughts to their parents, or will give up on communication because of long-term communication without results, and choose the easier option of compromise. Although I cannot say whether this will only happen in Chinese families, because I have not studied the situation in other countries' families' relations, nor have I experienced them. But for most Chinese people, filial piety does have a lot of influence on family relations.

3. The Chinese government's attitude and policy towards games

In this chapter, I will discuss the impact of government and social level development on the game. Due to the rapid development of the game market and a huge audience, the government began to control the game market when there was a development trend about 15 years ago, in order to give the public a safer gaming environment.

3.1 The Chinese government exercises its power to influence and shape the game industry

The political system of contemporary China has been described as "neo-Leninism" (Pei, 2006) and "Leninist corporatism" (Hutton, 2007). "These views emphasize the fact that the Chinese Communist Party (CCP) still acts as a vanguard and controls the economy" (Ernkvist & Ström, 2008). Since China is a country governed by a single political party, the central government has a wide range of power.

In the early years (around 1995), due to the rise of the Internet, games began to develop in China. However, due to lack of constraints, good games and bad games competed for the market, and there were many

illegal situations such as illegal practices, such as game piracy and bootlegging.

In order to govern it, the Chinese government issued a policy in February 2004, shows concern about the impact of the cultural form of games on minors and control them. Then in 2006-2007, some protection systems for minors were promoted, such as the anti-addiction system, that will be discussed below.

So, after these policies, we can say that the Chinese government supports the game industry, but still centralizes control over it. The majority of policies and regulations affecting the Chinese online game industry derive from government ministries (Ernkvist & Ström, 2008). But on the other hand, this is understandable because the main market for games is young people, but a large number of games will inevitably contain violence, sexual content, or bloody content, and children who are too young may receive the information prematurely.

Chinese parents are often worried that their children will be exposed to bloody and pornographic content prematurely through media, books, cartoons, etc., and they overprotect their children's "physical knowledge". In fact, children's curiosity is understandable for many things, but the traditional Chinese thinking is always so shy about these sensitive topics (especially related to adult content) that even between parents and children, they will avoid to talk about it. They not only don't want their children to get inappropriate content from the outside world, but don't want to express it themselves. Therefore, they are very supportive of the government's clean-up on game contents, and the derived harmful information, and they even pay too much attention to it. For example, many parents complained to the government that the corpses and blood in some popular FPS games are too real, which will affect the physical and mental health of their children. Later, the government carried out rectification and changed the blood to green.

On the other hand, it can also explain that China's game rating board is not perfect. Although there are games for specific age groups, few children are really restricted, because some children will use their parents' identity information to log in to the game to avoid the game's login restrictions on minors. Therefore, the government is more inclined to require game companies to make changes from the root cause.

3.2 Fight against game piracy

Piracy of games was a very serious problem in China in the early 2000s, because of the economic benefit to the player with pirated games. "Despite an improved formal legal system addressing IP rights (OECD, 2005), China has experienced severe problems in securing these rights (Stevenson-Yang & DeWoskin, 2005)." According to Liu's "pirated games undermine the desire by foreign companies to transfer technology and hurts domestic incentives in the pursuit of innovation" (2004). In addition, at that time, the public's awareness of copyright was worse than it is now, the free and interesting games are often a better choice even if they are piracy.

However, on the other hand, due to the weak capabilities of some local governments, corruption and the connection of interests, only a few pirated games have been seized and convicted, and most of them are used as warnings to be published on the Internet to achieve the purpose of cautionary, but in fact, it is not very effective (Ernkvist & Ström, 2008). Therefore, it can be said that some pirated games have survived the government's control gap, and the games that have escaped control have no way to restrict them. When this kind of supervision is not very effective, the awareness of copyright is still weak, some people (especially teenagers) are likely to choose pirated games because of funding problems.

This is also a serious problem that appeared at the beginning of the large number of games entering the Chinese market. Which may have left a bad impression on people, leading to parents' resistance to games later. In fact, I can't conclude this inference very sure, but a large number of reports and crackdowns at that time certainly had a certain impact on people's feelings. Such negative reports make parents feel that games may have a bad influence on their children, and therefore have a prejudice against games.

4. Definitions of game addiction in China

In China, many parents or elders call the phenomenon that young people like to play games as "game addiction", but how do to define the game addiction? Do these young people really like to play games be-

cause of their "addiction"?

4.1 Game addiction

It is worth noting that at present, there has not been any authoritative organization responsible for defining physical or mental illnesses (for example: World Health Organization, etc.) that defines "gaming addiction" as a specific disease. And in Wood's literature it says "some clinicians and academics have attempted to define video game "addiction" on the basis of their observations of some individuals who have concerns about their gaming behavior, or in response to other people who may have concerns about an individual's behavior (eg, parents, partners etc.)" (2008). Therefore, the current so-called "game addiction" phenomenon is only used to refer to excessive game behavior without academic support.

Now, due to the development of the Internet, the usage rate of mobile phones and computers has surpassed that of TV. On this basis, online video games have become a new and popular form of entertainment, and have become the main entertainment method for some people (ELSPA 2003). Indeed, under this development, some people cannot control themselves, spend too much time and energy on online games, and overplay. But it would be a bit too arbitrary to just use the term "game addiction" to define all situations. As Wood said, the reason for them to overplay games or other activities for a long time does not necessarily come from the matter itself, but may also come from some people's different concepts in social, psychological, mental state and time management. If there is an activity that can distract them, or make them forget other problems they have encountered, then they may escape the problem by falling into excessive activity (2008).

Moreover, the concept of "game addiction" is too general and naturally carries negative connotations. What we often say are "cigarette addiction," "drug addiction," etc. They all describe the continuous behavior formed by some people who cannot quit after encountering a certain item. However, online games are different. There is not a literal, mind and body altering, drug that make people addicted. All behaviors start from the people themselves and can be controlled by the brain. In addition, it has also been proposed that "addiction is the result of a

process" (Krivanek 1988). According to an article by Larkin (who was a scholar draws on applied psychology, phenomenology, implementation and intervention science, etc.) it "it involves a complex system of bio-psychosocial factors concerning the individual, their actions, and their culture" (Larkin et al. 2006). Shaffer also proposed that "addiction is a syndrome with multiple opportunistic expressions, there is often a great deal of comorbidity between addictions, and frequently people are often "addicted" to more than one substance or activity" (2004). Therefore, it is still difficult to conclude that in addition to the attractiveness of the game itself, whether there are more external and other factors that affect the "addiction" of the game.

However, China is very accustomed to calling the phenomenon of playing games for a long time as "game addiction." Even in the early years (around 2000), a large number of people called the games "electronic heroin" (There is almost no such name now), stigmatizing the game, thereby preventing young people from playing games.

4.2 The system of "Prevent youth addiction"

In order to better control young peoples' playtime, hierarchical management of the age of young people, some (real-name registration, "anti-addiction" system, which will be discussed below) are built into the games. Real-name registration means that players use personal numbers to bind, that is, the game account is associated with personal information. (One person's personal numbers can only fixed specific Chinese citizen, and which was given when logging in for the first time after birth, it is the unique personal information coded according to birthplace, birthday, gender, and other important information). The real-name system also cooperates with the anti-addiction system, the anti-addiction system controlled underage players can play for about 3 hours a day. Over time, the game may make no game gains or unable to play the game. And all these "punishments" are only for minor children under the age of 18. "And thereby contribute to the architecture of control" (Lessig, 2006). Zhang also pointed out that: "Another change in the information control mechanism is the increased emphasis among regulators on proactive, rather than merely reactive, regulatory policies" (2006).

For media industries such as online games, more operability and uncertainty means that the government needs to spend more time censoring. According to Ernkvist and Ström: "discourage online games with "unhealthy" content from reaching the market, through government-controlled screening committees and a number of licensing or Online Game Anti-Indulged System For Adolescent."

4.3 The academic stress of Chinese children and youth

For a long time, learning pressure has been regarded as an important factor in the mental health of Chinese students and adolescents. There are many sources of this pressure, such as a large number of study tasks, a study life with little rest, dissatisfaction with grades, competition among peers, high expectations from parents, and so on. This special form of stress, known as "learning stress" in China, can cause depression, anxiety, insomnia, self-doubt, self-denial, and even self-harm and suicide in serious cases. (Sun, Dunne & Hou, 2012)

According to Zhao, Zhu & Ma's research that "Chinese children and adolescents on average spend 8.6 hours a day at school, with some spending 12 hours a day in the classroom, usually six days a week. Among senior high school students, 78% of Chinese and 57% of Korean students spend 8 hours or more at school while very few of their USA counterparts do so. Additionally, Chinese students spend a large amount of time doing homework" (2009). It may be hard to imagine. But it's the truth. I have personal experiences with this system, and I spend about 12-14 hours studying every day in the last year of junior high school, and throughout high school. In addition to completing school homework every week, I also need to go to teaching institutions to take additional supplementary courses (because most students can't get the ideal grades by just studying in school), this is to be able to get a good score in the college entrance examination and go to a better university. Another example is my nephew was sent to learn mathematics and English beginning at the age of 3 to enhance his ability, and for reducing the pressure of learning competition future years in school.

But many times, due to the pressure and busyness of the parents themselves, they will not (or don't have enough time) communicate much with their children. They can only see the result: the children are play-

ing games; their academic performance has declined. Therefore, many people put these two phenomena together easily and rudely, that is, children's performance decline due to indulging in playing games, and promote this view, calling for the ban on video games.

5. Parent-child relationship

The formulation of Confucianism and policies has played a very important role in how Chinese parents treat their children. In addition, the estrangement between Chinese parents and children is not only because the two have been in a kind of class relationship for a long time, but also directly related to the traditional Chinese parent-child relationship and communication methods.

Imagine a very common phenomenon for children in China: a child who is in junior high or high school, about 12-17 years old. Their friend invited them to play online games together after school, but these children's parents did not allow they to play games because they still need to go to remedial classes after school. When he comes home in the evening, the parents may take the latest test papers and ask them why the grades have dropped, whether they have played too many games recently, and tell them that the important tests are coming soon and they need to work harder. The parents often quickly draw a correlation between their child's gaming interests and these study results - even though there might not be one. Then, their game consoles will be confiscated. Because there is only one child, the parents put all their attention and all hopes on the little shoulders of the children. And these things can happen at any time for most 12-17 years old Chinese children.

5.1 One-child policy

The one-child policy emerged in 1979 and was officially announced by the Chinese Communist Party Central Committee and the State Council's Resolution Concerning the Strengthening of Birth Control and Strictly Controlling Population Growth (1980). The State advocates that one couple has only one-child. Except for special cases, with approval for a second birth, government officials, workers and urban residents can only have one-child for each couple. However, with approval, those who have real difficulties (e.g.: the first child is a disabled

child and cannot grow into a normal labor force) can have their second child, several years after the birth of the first (Settles, Sheng, Zang & Zhao, 2013). However, in 2011, China introduced a "Two-Child Policy" in which if the parents who are both the only child in their original family, they can have two children. By the end of 2013, the policy was changed such that if one of the parents is an only child in the family can have two children. By 2015, the policy was revised again so that every couple can have two children. Another thing to mention is that if a couple has twins (or multiple births) directly, they are not allowed to have more children in all three policies (Baike.baidu.com, 2021). So, the one-child policy has already become a thing of the past, and is effectively a two-child policy today.

"Soon after China's one-child policy was implemented in 1979, the Chinese media was filled with discussions of how children born under that policy had failed to develop the obedience, caring/sociableness, independence, and excellence their parents, teachers, and society demanded" (Fong, 2007). In addition, Chinese parents always have high expectations for their children, hoping that their children can achieve good results in learning, because this is what they think is a prerequisite for success in a highly competitive world (Man, 1993), but this "high expectation" will often give children more pressure and burden.

But on the other hand, the one-child policy has indeed brought many positive effects. Rosenberg and Jing (1996) suggest that "a new interactive or reciprocating relationship may be the outcome for both family and society. Higher achievement, aspirations for education, greater leadership with peers, and identification with parents' values characterize the PRC's one-child families." Because of the formation of this social relationship and the popularization of the importance of education, children are more valued by society and families, and children's education has become the focus of most families.

The one-child policy has indeed brought high-quality improvements to the education of Chinese children, and at the same time, it also allows parents to regard their children's academic performance as a top priority. But teenagers often like entertainment. Many people are afraid of parental pressure, but cannot refuse the attraction of games, so they play secretly in their own rooms. This forms a vicious circle,

therefore, in the eyes of some parents, games have become the root cause of their children wasting their studies.

5.2 Parent-child's communication

Due to the influence of Confucian culture, most parents in China are accustomed to participating in children's decisions and affairs. In Huntsinger & Jose's research, it is found that Chinese parents will be more involved in their children's Internet use, and hope that their children's Internet use will be under their control. "Compared with the United States, parents' participation and control of adolescents more" (Huntsinger & Jose, 2009).

This can still be seen as an effect of the "San gang" in Confucianism, and early filial piety. There is a sentence in the "san gang" that is translated as "The son must obey the father absolutely." And the early filial piety advocated that "children should satisfy all parents' requirements within their abilities." In history, there was a famous poet named You Lu in the Song Dynasty who had a harmonious family and a good relationship between husband and wife, but the husband's mother did not accept the wife, she used "filial piety" as an excuse to force her son to separate from his wife. In this situation, love and filial piety cannot be satisfied at the same time, the poet can only reluctantly leave his wife in the end. This is also a very typical parent who uses "filial piety" as an excuse to force or control children to do things contrary to their wishes.

In modern daily life, most parents regard their children's academic performance as the most important thing in life. "According to a Zhejiang Academy of Social Sciences survey (Zhu 1992), 55% of the parents considered the good school achievement of their only children as the happiest moment of their families, and more than half of the parents say they would punish if the child failed an exam" (Settles, Sheng, Zang & Zhao, 2013).

According to this reference material, we can clearly see that some Chinese parents use their children's academic performance as a source of their satisfaction. Of course, I understand that as parents, most of them want their children to excel. However, in the study, it was stated

that more than half of the parents could not accept that their children failed the exam, and they would even punish their children in serious cases (Settles, Sheng, Zang & Zhao, 2013). This behavior is obviously too radical and inappropriate. Based on my experience and what I know, parents who punish their children due to their children's poor academic performance/declining performance existed even earlier in the age when I grew up. As mentioned above, many educational methods of Chinese parents are participation and control. Many times they are inconvenient to communicate, or even unwilling to communicate. They only hope that their children can follow their arrangements. Many children also enter a vicious circle because they cannot communicate with their parents, or cannot communicate the reasons why they are having troubles in their studies with their parents correctly.

As the child grows up, parents are very likely to put emphasis on telling their daughter to be an obedient person, saying that women who lack this aspect may be regarded as opposed or rebelled by the husband, husband's parents, superiors, etc. Although most of this education is aimed at girls, parents also encourage boys to be obedient because they believe that obedient boys will go more smoothly on the career path, and bosses will prefer obedient employees.

Chinese parents always have their own set of principles that seem to be established. What is interesting is that a large number of parents born before the 80s (China resumed higher education entrance examinations in 1978, so later people can receive relatively more education) have the same concept, which may also be the experience they gained when they were growing up. But they are keen to attach their own reasoning to the concept of children, even though many views are different due to the development of the times, for example, bosses may prefer smart and active thinking than obedient employees; girls' targets are not must be to find a good boy to marry, they also can make their own business, etc. But having said that, the starting point of many parents may not be bad. They don't necessarily want to control you to go in the direction they want, but to pass on the information they have summarized in their lives that they think are useful and want to give it to us, but the way is not suitable.

It is because the two generations have different concepts and different

ways of communication. Parents often do not understand their children's ideas. They only see their children's grades decline and they see children playing games, but they cannot communicate. Just as our mindset is not only determined by one factor, nor is a child's learning quality determined by one factor, but controlled education and punishment are not conducive to parent-child communication, and games may not be the main factor that affects children's score. But often they like to attribute the responsibility to the entertainment content that they cannot control.

5.3 Learning environment

Chinese elementary and middle school students have to spend considerable time on study even after school (Wang, Liu, Ding, Liu, Xu & Zhen, 2017). As I mentioned above, this matter is very common in China. In most students' study life, there will be more or less experience in remedial classes. Remedial classes mean that students find another mechanism to learn more difficult knowledge or review what they learned in school and deepen their understanding. There are also essential differences between remedial classes and interest classes. Remedial classes refer to the review and expansion of the knowledge learned in school (like math, biology or physics); and interest classes are the cultivation of hobbies (like guitar, dance or draw), all these courses use after-school time and weekends.

There is an old Chinese proverb that warns children to read: "Thousands of soldiers and horses cross the single-board bridge," which compares students with thousands of soldiers and thousands of horses. Crossing a single board bridge is likened to a learning process. On the other hand, the great pressure of parents on their children's studies also comes from the system of entering a higher school from China. In China, elementary school to junior high school are national compulsory education, called nine-year compulsory education. It means the government will fund learning to ensure the basic education level of children. However, high schools and universities have a very obvious and clear hierarchical system. Due to differences in education and resources, students in low-level high schools are difficult to enter high-level universities. It can be seen that the pressure of Chinese students' learning comes from not only the study itself, but also from

the huge student base, the educational hierarchy, and parents' expectations.

In addition, there are statistics about the data of entering a higher school (such as from junior school to high school, or from high school to university) in various regions every year. For example, I am from Shanghai, in the year of the high school entrance examination (2014), the probability of being promoted from junior high school was 47%; in the year of the college entrance examination (2017), the probability of entering an undergraduate university was 55%. Compared with other provinces and cities in China, Shanghai has a relatively high admission rate. Although the remaining students will able to continue their studies, they will be more restricted in the subsequent learning process and the diplomas they receive are also different. Nowadays, many Chinese companies are looking for new employees or interns. The first requirement is to graduate from a first-class universities and disciplines of the world (the higher level in the classification of Chinese universities and colleges). The quality of the graduated school has become the first stepping stone to job hunting. In this way, when checking the resumes of fresh students, the company will first screen them according to the graduated school, then leave students from well-known schools. In this way, even if some ordinary university graduates have more practical experience, finding a job is still a difficult problem to them. This is a very scary thing; it makes children have to bear the pressure of learning and long-term competition during the growth process.

It is precisely because almost all Chinese students are facing such a huge pressure to study and enter higher education. Therefore, as stated in Wang's research (2017), if students want to play games, they must consider how to allocate games and learning time. The ensuing question is, when Chinese teenagers encounter scheduling conflicts between playing games and completing learning tasks, and when games already have negatively affected their learning, what impact will these have on their choice intentions?

5.4 The thought gaps

In the context of Chinese culture, the attitudes towards online games for adults and teenagers are contradictory. According to data from

China Internet Network Information Center [CNNIC]: In China, the age group of most online game players appears to be teenagers (2014). However, most adults, especially parents, tend to oppose teenagers playing online games. According to data from a survey study, almost half of parents believe that playing online games is harmful to adolescents (Liu et al., 2015).

In fact, I am not clear that where these parents came to the conclusion that "online games are harmful to teenagers," but their views are surprisingly consistent. In the early 2000s, when online games just became popular in China, some experts liked to make a fuss about "online games are harmful to children's physical and mental health.", and write some articles. In summary, the reason is nothing more than: playing games will affect children's learning; playing games will cause children to imitate dangerous actions; playing games will waste time; playing games will cause myopia.

About 5-10 years ago, I often saw news like "Because children spend too much money on online games, a mother in take xx game to court;" "Because child plays games and doesn't learn, xx father filed a lawsuit against the game company;" "Because the child imitated the parachuting action in the game/animation and fell from the 5th floor, the parents took the game/film company to court" and so on. Obviously, there has some sad examples that are genuine and well-founded, on the one hand, the company has part of the responsibility, I think that the game settings at that time indeed be lacking. Many behaviors are not marked as "non-imitable," and the real-name system and security system are not perfect. Children can easily steal their parents' bank cards for consumption in the game; on the other hand, parents' awareness of their children's daily safety whether education is complete, including property safety and personal safety. In a general understanding, parents need to educate and discipline the behavior of children who are not fully capable of distinguishing right from wrong.

Older Chinese people tend to be a little stubborn, not easy to listen to the opposite of their own opinions, and somewhat resist the emerging trends, but even if there are extreme cases, we still cannot assert that online games are harmful to teenagers because the main players of online games are teenagers, and there are few adults and parents in

contact with them. Online games can also bring relaxation to players and regulate life pressure. This is two generations or the ideological gap between players and non-players. It needs to be adjusted slowly, and it needs to be communicated well.

6. Conclusion

The ideological difference between Chinese parents and their children is not only reflected in the attitude towards games, but also in many other aspects. It is also the result of long-term external influences and historical concepts. Traditional culture and Confucianism have long been in conflict with the openness, tolerance, freedom, and equality that are now being advocated. Of course, I don't mean that all Confucianism and traditional Chinese culture are problematic. In this article, I only put forward some of them, the early concepts, and the impact it has on me and my previous generations.

But on the other hand, I am very grateful to my parents for having sufficient understanding and proper communication when I was growing up, so they did not overly force me to do things I didn't want to do, or force me to leave the game. As I said in the article, appropriate game can be regarded as the adjustment of life pressure, and I hope that more people can see the games in a correct way.

Thoughts are not formed in a day, and of course, they are not only affected by one factor. The government systems, policies, and reforms I mentioned in this article; changes in ideas, conflicts between ancient and modern; the influence of the learning environment, the parent-child communication, the change in thought forms is the reason why our two generations have different views on games. In fact, I am discussing the full text from the perspective of young Chinese people. If you look at it from the perspective of adults, there may be completely different content. I don't insist on distinguishing right from wrong here. What's more, the new generation of parents already has more comprehensive thinking and broader vision and acceptance. This is just a collision of the ideologies of our two generations, and I believe that similar things may have happened in many countries in the world during the development process. I wrote down what happened in China, as well as my understanding and opinions, as a reference.

In fact, I think that in recent years, Chinese people's understanding and acceptance of games has changed to a great extent, and the enthusiasm of young people for games is also very helpful for development. So, in this new game era, what kind of development will the Chinese game market have, and what kind of game exchanges there will be between parents and children in the future, is what I am looking forward to.

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Chapter 15

Trans Play

Imagining the Future of Trans Games

Felix E. Redig

Abstract

The discussion of LGBT, and specifically, trans identity and its place in games is one flourishing with more and more research from scholars. Though a glaring issue still seems to haunt the field, as the voice of LGBT creators and gamers seems to be missing from the video game industry and research alike, which is counterproductive to the ultimate goal of bettering the environment of games for LGBT gamers and creators. As a subset to this, a similarly lacking voice is that of the trans gamer. This chapter aims to therefore, in adjunct with a larger thesis project which effectivizes the methods which will be discussed in this chapter, further explore the landscape which trans stories find themselves in in the current environment of game development.

Keywords: LGBT Representation, Trans identity, Anthropology, Ethics, Game development, Sociology.

1. Introduction

1.1 Representation and hegemonies

First coined by Bernie DeKoven in a lecture in 2005, and cited by Janine Fron et al. in *The Hegemony of Play* (2007), the term "hegemony of play" describes a pervasive hegemony within the video game industry, a majority, which consists of a homogenous, mostly white,

male-dominated group (Fron et al., p. 309, 2007). In *The Hegemony of Play*, Fron et al describe the very same hegemony as "a creative power elite" of sorts, that determines which technologies will be deployed or not (Fron et al, p. 309, 2007). The term has seen usage by many other contemporaries, such as Bo Ruberg, who in their anthology titled *The Queer Games Avant Garde*, details the landscape which LGBT games and creators face in the video game industry by sharing their stories from an insider perspective (Ruberg, 2020). Ruberg argues that these LGBT creators are part of a so-called avant garde, as they unapologetically step outside the hegemony and mainstream and dare to create as pioneers of the field, thus the namesake of the Queer games "Avant Garde" (Ruberg, p.10 2020).

To first understand the significance of LGBT (i.e: Lesbian, Gay, Bi and Trans) representation, or a so-called queer games avant garde, one must first recognize that *The Hegemony of Play*, has historically fostered a mainstream environment which shows a degree of hostility towards minority-groups that fall outside said hegemony of white male gamers (Fron et al, p. 309-311, 2007). This hostility is something which not only Fron and her colleagues, but also Ruberg and the creators in their anthology, describe in great detail in their respective works. It is not unheard of, says Ruberg - that minority groups such as non-white or LGBT people are either misrepresented, harassed or simply made unwelcome in the artistic medium of video games, by either gamers or the games themselves (Ruberg, p. 11, 2020). However, despite adversity and a seeming scarcity of representation, many scholars such as Adrienne Shaw actively work to document and bring to light explicitly LGBT video game characters and works which exist throughout history as far back as four centuries. Shaw describes in an interview with Ruberg in *Creating an Archive of LGBTQ Video Game Content* (2017), much like Fron et al, that the seeming "lack" of LGBT representation within the medium may be attributed to something other than a literal scarcity, as much as a purposeful expunction or ostracizing of content deemed as "not real", or "not game enough" by the majority of the audience. Shaw reiterates that there seems to exist not only a prevalence of representation historically but even in the current day, leaving the namesake of an "avant-garde" a very befitting term.

Ruberg continues to explain that LGBT, and particularly, *trans* people,

are frequently harassed and scrutinized within online spaces by these often reactionary, hegemonically normative audiences that tend to flock to games (Ruberg, p. 11, 2020). Often these reactionaries even go so far as to argue through online discourse that games that exhibit any manner of representation or themes by and for LGBT or minority audiences become "too political" (and thus, no longer classify as games). Though, despite reductive categorizing and risk-averse dismissal from the industry (Fron et al, p. 311-315, 2007), LGBT games still hold an important place within the medium of video games. In fact, Elizabeth Sampat describes, in Ruberg's anthology, that making space for queer identity in games is intrinsic to allow for future LGBT games to flourish in the first place (Sampat, p.76-77, 2020).

Creators invited to *Ruberg's Queer Games Avant Garde;* such as Dietrich Squinkifer, creator of the point-and-click detective-game *Dominique Pamplemousse* (2014), and other contemporary LGBT creators such as Aevee Bee, creative director of the acclaimed *We Know The Devil* (2015), or Robert Yang, creator of several explicitly and intimately gay games, such as *Radiator* (2009), fervently exemplify Sampat's point. They continue to unapologetically create media by and for other LGBT people within a medium where they are often misrepresented, made unwelcome or harassed (Ruberg, p.8, 2020). Giving accounts of one's own marginalized story to the world is essential in furthering the development of critical media analysis, as well research pertaining to LGBT representation and social justice. Doing so, as Fron et al put it: is intrinsic in granting insight to the public, and in the effort of destabilizing the hegemony which still permeates the video game industry (Fron et al. p.315, 2007).

Ruberg explains that their work, and the queer games avant-garde, share a committment to the LGBT perspective of the medium of games (p.8-9, 2020), something which inspires me greatly, as I am myself transgender, and desire to enrich this perspective with more stories. This chapter aims to, through analysis of previous work and interdisciplinary research, expand upon the already established works of scholars within the same field, and to in the adjunct thesis project, explore what exactly exists at the core of games that makes them important to trans gamers. And moreover - what the future of trans games looks like.

2 Background

2.1 LGBT Stories in the landscape of games

Ruberg's anthology finds itself in an interesting place within the field of LGBT game research. The name of their work, *"The Queer games Avant-garde"* is befitting, as the LGBT creators within it bravely create purely with and for people such as themselves, even within an environment so turbulent and adverse to "other" creators (Sampat, p.76-77, 2020). A distinguishing detail of Ruberg's work, compared to that of contemporaries, is a unique and undeniable distinction between outsider and insidership, due to Ruberg's own status as LGBT. They state that there lies a great significance in the fact that their anthology invites its LGBT game developers to specifically speak about themselves and their stories - *together*. As opposed to the fashion in which they are frequently featured in articles and research, where the developers are instead invited to partake in tokenizing articles, sharing oversimplified messages of positivity of "how much better things are getting in games", rather than their actual stories and perspectives (Ruberg, p. 9, 2020). This concern of doing justice to stories reflects what Nassim Parvin describes in her work titled *Doing Justice to Stories: On Ethics and Politics of Digital Storytelling* (2018). In her work, Parvin asks a simple question - is it really enough to believe that storytelling, especially when disseminated and curated through more traditional means of research, really does justice to the meaningfulness of the original story being told (Parvin, 2018)? This call to attentiveness of the complexity of stories, both from Ruberg and Parvin, interestingly finds itself as the raison d'être of what this chapter seeks to explore, by expanding upon pre-existing research with alternative approaches and by re-examining what it means to tell the stories of marginalized groups such as the trans community.

Parvin holds an interesting perspective, as she is situated at an intersection of disciplines, such as digital media aimed at advancing social justice. Much like Fron et al's critique of a mainstream video game industry, Parvin critiques contemporary mainstreams of research, such as media studies and their approach to marginalized groups stories and issues (Parvin, 2018). It would almost seem as if much of the work conducted in the name of advancing social justice in video games still holds on to the risk-averse behavior which the mainstream video game

industry exhibits often in the name of profitability. Less so does the mainstream seem to truly be interested in creating an environment in which LGBT creators themselves can break into the industry and to tell their stories through the digital medium of video games. Instead, many of the studies conducted, and games created, says Ruberg, seem more interested in attracting LGBT gamers as potential consumers, through surface-level representation, rather than providing a meaningful and safe digital space or story (Ruberg, p.18-19, 2020). Most times this is done by dressing up their games with the promise of LGBT themes and stories, despite little, if any, representation at all. Game developer Elizabeth Sampat describes the video game industry and its landscape as tumultuous for non-hegemonic groups, based on her experiences of both independent game-development, and with studios such as *Storm8* and *Popcap* prior to her participation in Ruberg's anthology. In her interview with Ruberg, Sampat continues to describe that within such a turbulent landscape, it is often uncommon for marginalized groups to break into the video game industry as creatives at all (p.76, 2020), thus, a pervasive lack of LGBT creators within the mainstream becomes apparent. Ultimately, what Sampat and contemporary LGBT writers have in common, is a call to reform to the often rampant anti-gay, transphobic and transmisogynist sentiments often upheld by *The Hegemony of Play* in the industry.

Examples of "LGBT" stories such as those in Blizzard Entertainment's game *Overwatch* (2016) come to mind, in which one of the playable characters, Tracer, was famously announced in an official comic to be a lesbian. The announcement was applauded by many within LGBT gaming communities, says Ruberg, but an equal number of LGBT people seemed to harbor the sentiment that the representation rings hollow, due to the fact that her status as LGBT, presented in the comic, is completely missing within the game itself (Ruberg, 2020). Fron et al argue that cases such as this occur due to companies fearing missing out on potential sales with their core audience, i.e the loyal, hegemonious mainstream of often reactionary and anti-LGBT gamers, or simply non-LGBT players (Fron et al. p.316, 2007). What is left of the supposed LGBT story reflected in Overwatch is nothing but tokenized dressing for media which has little to nothing to do with actual LGBT stories, as it instead reflects a desire of inclusivity only in sales figures - disregarding what the outcome may be.

2.2 Games and examples of trans game research

Is it unethical for someone not belonging to a certain marginalized group to research or retell said group's stories in the first place? Naturally this is not the case. Parvin argues, all storytelling holds a degree of power in furthering attentiveness and sympathy to cultures and groups of people whose stories may often go untold (Parvin, p. 528-530, 2018). And importantly, despite the sometimes disseminated and editorial aspects of outsider's work, much of the research already conducted within circles of serious games, media studies and social justice do serve the important function of destabilizing the mainstream by sharing marginalized stories (Fron et al, 2020). Though, as Parvin further reiterates throughout her work, whether or not research does justice to the stories being told is often greatly dependent on the context in which the story is told, and what factors may shape the research in different ways.

Morgan and colleagues' study titled *"The Role of the Avatar in Gaming for Trans and Gender Diverse Young People"* (2020), in which Morgan et al make an effort to showcase stories of why games are important to trans gamers, presents a qualitative approach to researching trans stories. In their study, Morgan et al utilize a focus group interview method to which several trans individuals are invited to discuss topics regarding trans identity, representation and avatars in video games. Their research is primarily conducted to attempt to discern if usage of avatars in video games provides benefits for transgender youth's mental health, in adjunct with a broader serious games project, with the goal of preventing depression amongst transgender youth (Morgan et al, 2020). The target audience which Morgan et al gathered from would ultimately consist of a focus group of Australian, transgender youth, all of which primarily would have found Morgan's study through promotions around Perth's metropolitan area as well as through social media, and other forms of convenience sampling. Morgan et al uphold a continuous effort to ensure the safety and privacy of their participants, later even going on to edit the transcribed study to omit any identifiers of the individuals, something which is greatly commendable, especially when research is - at least partially - conducted by outsiders ("partially" as one of Morgan's colleagues identify as trans).

The findings of Morgan and their colleagues' study would seem to

indicate that games do play a great role not only to trans youth's relaxation, but as well being described by participants as a sort of escapism from real life. These findings coincide with much of what Sampat claims is provided by the safe space of the video game medium, turning the space into much more than entertainment (Sampat, 2020). Though importantly, as the field of research pertaining to trans identity in video games is still in a budding state, it becomes once more relevant to branch out to research which may complement trans game studies with findings that coincide with what trans creators argue make games important to them. Luckily, the works of people such as Dmitri Williams and colleagues, share a similar trajectory as that of Morgan et al, as Williams and colleague's work titled *Behind the Avatar: The Patterns, Practices, and Functions of Role Playing in MMOs* (2011), in a two-part quantitative and qualitative ethnographic approach explore the lives and practices of people who play online role-playing games. What Williams and colleagues share in common with the works of Morgan, and even of LGBT developers such as Sampat, is an understanding that roleplaying and emergent communities in games function as an important refuge for marginalized groups (Williams et al. 2011).

Similar findings of both Williams and Morgan et al are shown by contemporaries such as Mark D. Griffiths and colleagues in their study titled *Video Gaming and Gender Dysphoria: Some Case Study Evidence* (2016), in which they present stories of four trans gamers, who all argue that online spaces and video games serve an important function in alleviating dysphoria (The trans concept of dissatisfaction with one's body and physical appearance). Though, regrettably, several factors detract from the study and its intentions of telling trans stories, as much of the language and terminology used by Griffiths and colleagues perpetuate transphobic sentiments. For example, Griffiths et al frequently use terminology such as "*he* sees *himself* as a female," and similarly continuing to refer to participants as "male" despite them identifying as trans women (Griffiths et al. p.63, 2016). Whilst most certainly not purposefully transphobic, the perhaps unanticipated outcome of the dated terminology and sweeping statements is a study which is not likely to garner a trans audience, exemplifying many of the pitfalls which plague research. For example, a lack of trans scholarships, as Griffiths and colleagues instead focus on research which documents the consequences of dysphoria and transitioning, more often than not,

from the perspective of outsiders seeking not to further social justice, but to simply document the marginalized group's stories and issues.

2.3 Insidership and marginalized stories

What then of insidership? Interestingly, an example of an approach to the matter comes not from research pertaining to social justice, but instead from research about online cultures. Celia Pearce's *Communities of play: Emergent cultures in multiplayer games and virtual worlds* (2009) presents a unique and relevant approach, as Pearce explores the communities which emerge from online multiplayer games. What is most notable about Pearce's research, as her work revolves particularly around the social diaspora of Cyan world's *Uru: Ages Beyond Myst* (2003), is that she herself was an active part in the game's community. Pearce shares many of the sentiments of contemporaries such as Sampat or Parvin, as she for example decries the claims of certain anthropologists that play is an inconsequential activity or meaningless make-believe (Pearce, 4-5, 2009), and similar to Parvin, argues that the comradery of insidership lucratively lends to generating insightful stories (Parvin, p. 530, 2018). Like Williams et al, Pearce implores that there lies a deep and yet unexplored connection between the player and their avatar, and that online spaces serve as an important place for personal exploration. As her own participants and cohorts would even infer, in a fashion similar to Goffman's exploration of the self and how it is represented in our actions and roles, their online avatars and their roles within the game are representative of their "true self." Another essential aspect of Pearce's ethnography of the player-base of *Uru: Ages Beyond Myst* (Cyan worlds, 2003), is as she argues, that her participation in their culture is required, as "You cannot observe a virtual world without being *inside* it" (2009, p. 196, Pearce). Similarly, she goes on to argue that the same is true for other cultures, as for example, if one is to research the stories of those participating in a renaissance faire, one should conceivably participate and play along rather than simply observing it from a distance (2009, p. 196-197, Pearce).

Important to note when researching around minority groups such as trans people, is privacy. As both Sampat and Ruberg detail, online spaces reflect much of the transphobia which trans people are subject

to in society (Ruberg, Sampat, 2020). Oftentimes, trans people will even make an effort to hide their identity as trans, both on and off-line, to avoid facing the consequences of social ostracization and harassment. Worst-case scenarios occur in the form of, for example, the work conducted by Laud Humphreys in *The Tearoom Trade* (1968), a study which can be considered an ethical disaster due to a degree of dismissal of caution shown by Humphreys. *The Tearoom Trade*, at its core, was intended to explore the underground lives of gay men who meet in public restrooms for sexual relations, though the way in which Humphreys would approach the subject would be littered with deceit and misconduct, much due to the lack of privacy provided to the participants invited. This lack of privacy and concern for the fragile group researched by Humphreys, would post-study, lead to the outing and ostracizing of gay men who had not come out to people in their surroundings. Many of which who were even married, their identity as gay unbeknownst to their families. What could easily be dismissed as an "unintended consequence," Nassim Parvin and Anne Pollock argue in *Unintended by Design: On the Political Uses of "Unintended Consequences";* should more consequently be viewed as a lack of accountability for the researcher (Parvin & Pollock p.323, 2020). The consequence of outing the participants of Humphrey's study should perhaps instead be seen as an unanticipated consequence, as by design, the study lacks the rigor which would intend to keep its participants safe. The researcher plays an undeniable role in the findings and method of the study, and to claim that they and their tools are impartial, or that they are in a way "invisible," is not only irresponsible, but, as Ruha Benjamin would phrase it in her critique of technology's role in research titled *Race After Technology* (p. 79, 2020), indicative of underlying interests and motivations or a moreover disregard to safety of the marginalized group in question.

2.4 How to go about telling stories

To an insider, explaining the role of the video game medium in relation to one's own trans identity is already difficult, and doing so to someone who may not understand many of the nuances of your identity to begin with, further complicates things, elaborates Parvin (p. 521-523, 2018). Take for example, the concept of non-binary identity, an identity which entails that a trans person identifies outside of the

gender binary of male/female, or that they disregard the binary. An outsider may misconstrue non-binary identity as a "third" gender of sorts, rather than recognizing it as a complex deconstruction of societal gender norms. With these rational fears of being misconstrued comes an uncertainty which a marginalized participant may feel towards studies in which they may be partaking. In a fictional story presented by Parvin, a hypothetical participant named Tyler, belonging to a marginalized group is invited to tell the story of his community by a researcher named Beth. Throughout this study, Tyler's primary goal and intention is to do justice to the stories of those people belonging to his marginalized community, and to attempt to give the outside world a window into their community. Though, despite the honest and forthcoming approach from the researcher, Tyler ultimately does not feel accomplished by the end of the hypothetical project, nor as if the story he told Beth truly represented the full scale of his life. In fact, Tyler more so feels a degree of uncertainty towards the true intentions of the project (Parvin, p. 523, 2018). Tyler's urge to tell his own story, paired with a worry regarding whether or not the researcher and their audience will truly "get" his group and their struggle, encompasses much of the reason why people such as Parvin seek out alternative methods of telling stories. Particularly, in Parvin's case, digital methods of storytelling, which may allow for further nuances when sharing one's complex, and often unnarratable life story.

Many different approaches to telling stories precede Parvin's exploration of alternative methods to storytelling, however. For example, Clifford Geertz similarly serves as a strong inspiration for an illustrative way to tell stories, albeit in a traditional fashion, as Geertz describes in great detail the culture of Balinese cockfighting through thick description. Geertz makes an effort to clarify when for example an otherwise innocuous term may mean something completely different within the underground setting of cockfighting in Bali (Geertz, p. 75-77, 2000). The clarification of contextual clues provided by Geertz would align with the intention to contextualize, as Ruberg puts it, the often misinterpreted aspects of trans identity (Ruberg, 2020). By being illustrative and thorough in a similar fashion, one finds oneself able to discuss through text, certain nuances that would otherwise be lost. In the pursuit of doing justice to stories, it is notable that it is not not the purpose of a researcher to find and disseminate a "true self," veiled underneath

layers of context and roles accumulated from the participants of their research. In fact, acclaimed sociologist Erving Goffman, in *The Presentation of Self in Everyday Life* (2007), challenges the existence of a "true self" underneath our actions, instead proposing that the actions and roles which we play in our every-day lives is a collective structure of our "true selves" (Goffman, 2007). Quoting Judith Butler's book, *Giving an Account of Oneself* (2005), Parvin argues that human stories rarely engender transparency or continuity, instead arguing as Goffman and Butler does, that stories are constructed from the actions and contexts in which they are told (Parvin, p. 525, 2018). What researchers such as Parvin and Geertz strive for, is to contextualize these stories and accounts, and to show how the roles of humans come together to form an ever-changing life-story.

3. Conclusions

With to the prevalence of hegemonic structures such as the "hegemony of play" which DeKoven describes, and the behaviors which reactionary groups foster within online spaces, the environment for fringe, marginalized identities in online spaces is often greatly fraught with scrutiny, says Ruberg (p.8, 2020). The permeation with which racism, misogyny and generally anti-gay and anti-trans sentiments seem to flourish in the online landscape of video games and within technologies, makes it evident why openly revealing oneself as part of these marginalized groups in otherwise anonymous online spaces may be unfavourable. The presence of such a hegemony, not only within the online landscape, but within the real world, may in fact be one of the primary contributors to the lack of research from the inside with regards to trans identity, as similarly reiterated by both Shaw and Ruberg (Shaw, Ruberg, p. 165–173, 2017). It is therefore of utmost importance that, as the hegemony continually becomes more and more destabilized, and the public's understanding of trans identity and its place within the medium of video games broadens, that trans voices and their stories remain intact, and that they continue to be upheld as the most essential qualities of research.

With regards to the critique aimed towards them in this thesis, it is intrinsic that research such as that of Morgan's (2020) and William's et al (2016) does get conducted, as furthering the public's understanding

of the trans community - as well as their connection to the video game medium, is essential to allow for research such as this study to be conducted in their footsteps. Though, reflecting upon the works of contemporaries within social justice research, the progressive aspect of their work can appear almost stagnant or misguided. Often, they seem interested in documenting and recording the data of trans youth and their connections to games, rather than seeking to do justice to their unique stories or enriching the future with their perspectives. "A narrow investment in technological innovation necessarily displaces A broader set of social interests," says Ruha Benjamin (p. 79, 2020), encapsulating many of the shortcomings which may befall more traditional research and technologies. If we as researchers uphold the belief that objectivity and "truth" is attainable through tools which we consider politically neutral or partial, we fail to recognize both the non-neutrality of toolkits, and as Parvin phrases it, the fact that human stories are not narratable in an objective vacuum (Parvin, p.524, 2018).

Research such as that of Griffiths and colleagues finds itself perpetuating what can be seen as a form of violence, as phrased by Butler (2005), by assuming that human stories can be viewed as continuous, transparent and rational. In fact, "giving an account" of one's life story is undeniably formed by the context in which one finds themselves when giving that account. For example, the environment which the participants of Griffiths and colleague's study are faced with, may entail similar anxieties such as those presented in Parvin's fictional story, wherein the hypothetical participant, *Tyler*, finds himself unsure of what the account he had provided the outsider researcher, *Beth*, says about him and his community. Does it in fact tell his own, and importantly, his community's story accurately? What could have been said differently to include certain aspects which outsiders may not understand? Will outsiders to his community care about *Tyler's* story, and what does *Beth* truly intend as the outcome of their study (Parvin, p. 519-521, 2018)? As the hegemony continues to destabilize, perhaps the beliefs of core audiences who prioritize and demand respect for games as infallible artifacts (Fron et al, p. 312, 2007), will give way for a public belief built on critical theory, and an expectation for games to instead respect *them*.

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1.1 Ludography

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Chapter 16

Same-Sex Romances in Games

Sandra Alexandersson

Abstract

In this paper, the author uses her personal experience of encountering and engaging with same-sex romances in games as a way to discuss the positives and negatives of same-sex romances in games. Like all people, LGBTQ players look to role models in media for guidance and solidarity, and romantic relationships in video games can create particularly strong attachments for players to characters. Yet LGBTQ representations in games are rife with negative stereotypes or worse: complete exclusion. The paper argues for the potential power of games to help minorities explore their identities.

Keywords: LGBTQ, queer gaming, romance in video games, dragon age, mass effect, LGBTQ representation

1. Introduction

I started my journey exploring RPG games with *Dragon Age: Origins* (2009) (DAO) back in 2009 when I was in my mid-teens. It was released in November, and I was looking for games to put on my Christmas list, as I did every year. When I found Dragon Age, I had no idea it would feature something as foreign as *romance*; I was more intrigued by the dragon on the cover. I love to stop and exclaim "dragon!" whenever I

see one in a store, and was more upset at the death of the dragons in Game of Thrones than the characters (not that I watched that show in the end, I just followed it critically on the sidelines and watched the dragon videos, I promise).

And while I thought DAO would give me dragons (which it, frankly, didn't), it gave me a completely different experience I hadn't even thought about before. It allowed you to create a character, in my case a rogue carrying a greatsword, because hey, I was new to the RPG genre and didn't understand anything. Besides all that customization and monster slaying, you had companions. You could even "romance" some of them.

"Romancing" allowed you deepen your bond with the character through gifts, actions and dialogue until the point where you could embark on a romantic relationship with the character. It was a foreign concept at the time for me.

What was even more amazing to me was that I could play as a female character and engage another female character in a romantic relationship. When I realized this, after recruiting the sweet Leliana claiming to be an innocent Chantry sister (a lie), my mind was boggled. Never in my life had I considered that this was an opportunity, or rather, that it was an opportunity people looked down on. While privileged to live in a more accepting country, Sweden, I had grown up with the notion that while being a lesbian was "accepted", people tended to gossip about it and treat it as something weird or strange. I had been to family gatherings where some distant relative I never heard of wasn't present, but at the dinner table people still talked in terms of "Oh, she turned out to be like *that*," all while giving each other knowing looks. Of course I was a kid at the time (and stuck at the kid table), but the memory lingered. Yet here this game that I thought would give me a dragon told me that romancing a woman with my female character was acceptable.

Now you might think that this is the point where I realized my own identity and fell into Leliana's arms and embraced this newly discovered part of me, but in fact, it was not. I went for Zevran, the scheming, suave elf instead. When I replayed the game again, now with a male character, I went for Zevran again. And again. Not until my later play-

throughs did I dip my toe into Leliana's romance, and then I did so in the comfort of a male character.

To this day, I haven't romanced Leliana with a female character. But the allure, the spark of thought the character evoked in my head, remains. I consider this to be the moment when I did realize that I had an identity diverting from the heterosexual norm, but I was too shielded, too naïve and too frightened to explore it at the time. I only realized this in hindsight.

2. Gay Representation in Gaming

The games market is not exactly famous for its saturation with queer characters. I certainly hadn't seen a single character portrayed as LGBTQ up until the point I unwrapped DAO for Christmas, and I had been playing on both handhelds and consoles since 1999. Still, that doesn't mean queer characters didn't exist at the time.

Adrienne Shaw and Elizaveta Friesem report that the earliest games they found including queer themes were released in 1986 (2016). In an interview conducted in 2017, Tucker Berardi spoke to Shaw regarding the fact that Ellie, protagonist of the critically acclaimed *The Last of Us* (2013) was revealed to be a lesbian in the DLC *Left Behind* (2014), and Shaw noted that LGBTQ characters had been in the background in a lot of games, but after analyzing games stretching from 1980 to 2005, only 207 characters were found. A small number, although Shaw also pointed out that the amount of characters is increasing, albeit slowly (2017).

Perhaps it is not surprising that I didn't come across any of these characters in the vast catalogue of titles published over the years. However, given the prevalence of negative portrayals, perhaps it was better to not come across it at all. Inclusion of queer characters doesn't necessarily mean that it's positive (Shaw, 2009; Shaw, 2012; Shaw and Friesem, 2016; Pelurson, 2018). Characters suffer from tokenism, stereotypes and outrageous depictions of "[...] predatory or lecherous men included for comedic effect" (Mulchay, 2013, para. 9). However, in Pelurson's thorough analysis of Dorian Pavus in *Dragon Age Inquisition* (DAI) (2014), which I will return to later, Pelurson notes that stereo-

types doesn't need to be shunned, since they exist in a wider societal structure and therefore can be used as a tool of resistance (2018). A fair point, and important thought to keep in the back on one's head. However, the use of stereotypes can also have negative impact on LGBTQ individuals, which can create feelings of exclusion and harm identity expression (Gomillion and Giuliano, 2011).

Clearly, LGBTQ representation is a slippery slope, perhaps impossible to navigate perfectly. How does one write LGBTQ characters, and how does one do it in an appealing way? When looking at characters presented as caricatures or stereotypes it is easy to see solutions for poor representation. The understanding for LGBTQ people and their diversity needs to be expanded upon, and this shouldn't only fall on queer developers. The difficulty with LGBTQ characters seems to stem from the subjective opinion of what can be perceived as "good" representation. I touch upon this in the next section where I discuss two characters, Dorian and Sera, from *Dragon Age Inquistion*.

They are an interesting case of LGBTQ characters to observe, especially Dorian, since the character has been hailed as one of the best portrayed LGBTQ characters in games. At the same time, he has faced harsh critique for relying on stereotypes for how a gay man should look and behave. Some queer players adore the character and others think he's yet another example of poor writing of an LGBTQ character. As a creative writer myself, it makes it hard to discern what is actually good representation, since opinions differ on what can be perceived as appealing and well written. I might think Dorian is a good character and that his sexuality was tactfully laced into his overarching narrative, yet the portrayal was offensive to others. It seems difficult to find a consensus on what is good and respectful once you leave the trench of tokenism and caricatures and start delving into deeper character design.

Looking back to my own experiences, I, to do this day, can't say that I have found a Sapphic character that I have fallen for. I remember finding Samantha Traynor from *Mass Effect 3* (2012) laughable in terms of how the sex scene between her and the female Shepard played out like the picture perfect pornographic video in a man's lesbian fantasy.

Masculine fantasies dominate design discussions, Shaw states in an article from 2009, and *Mass Effect 3*'s portrayal of Traynor is just one

instance where it seems evidently clear. With Traynor not being a companion (meaning you can't bring her on any missions) and therefore stuck on the ship for the whole game, it felt like a shoehorned example of the developers sticking the character in the game, exclaiming "Look! We did it! We have a lesbian!" while completely ignoring how unattractive the romance was from both a gameplay and emotional perspective. I was fine sticking to Garrus, a heterosexual romance that not only felt genuine but allowed my Shepard to tackle the annihilation of the galaxy shoulder to shoulder with a trusted partner.

Lesbian characters being put in games as targets for the gaze of the heterosexual are a common phenomenon (Shaw, 2009), and it makes these faux-lesbians characters wholly unattractive for women wanting to experience lesbian love in games. The sheer amount (I say that as if you can stumble over a lesbian under every rock, but bear with me) of lesbian couples in games compared to gay men seems to confirm my theory that their inclusion has more to do with the typical, straight male finding them erotic and therefore desirable and worthy of inclusion.

Heterosexual men favoring lesbians over gay men have been indicated in science over and over again (Brown and Henriquez, 2011; Herek, 1988; Louderback and Whitley Jr; 1997). Louderback and Whitley Jr. believe this has to do with the erotic value heterosexual men find in women which makes them more positively inclined to this minority, whereas gay men are disregarded for lacking this appeal (1997). I agree with this line of thought, but it would be interesting to conduct studies focusing solely on games to delve into this matter further.

3. Sera and Dorian Pavus

If we skip to 2014 to the release of DAI, a lot had happened since my initial introduction to Leliana in 2009. By then I had at least one foot out of the closet, identifying as a lesbian and had entered a lesbian relationship. During those five years I had spent hundreds of combined hours in *Dragon Age 2* (DA2) (2011) and the *Mass Effect* trilogy (2007-2012). As previously mentioned, Garrus stole my heart in *Mass Effect* and I never personally explored the gay romances added in *Mass Effect 3*, besides consuming them online by watching playthroughs, since

they didn't appeal to me and I was hooked on my loyal turian soldier. The only female I romanced was Tali, sadly through a male character, since that was my only option (which annoyed me to no end).

DA2 was a whole other story, since the game created a romantic system that was labeled "playersexuality." Lindsay D. Grace defines playersexuality as an NPC in a heteronormative game environment who is romantically interested in the player regardless of the gender of the player character (2020). Notably one of the characters, Anders, seems to be written with the intention of him being gay, and this is strongly alluded to in his personal quest, yet he also falls into the category of being playersexual.

Playersexuality is a complex issue. Is it bisexual erasure, is it inclusive for everyone, or is it good bisexual representation? The pirate captain Isabela seems to be written with the intention of being bisexual, but with everyone being playersexual it is hard to tell, just as it is with Anders. Due to this design choice, it is hard to identify with any of the characters, since they seem more like vessels there to please everyone. I admit it was nice to a point to feel the freedom of pursuing anyone, but in time the novelty wore off. Nowadays I can appreciate the attempt, but in my opinion it doesn't quite count as proper representation in any direction, since it seems to appeal more to the player fantasy of choice and gives the player power to pursue anyone.

DAI went in the opposite direction, getting rid of the playersexual companions and announcing that they would, finally, feature love interests exclusively for same-sex romances. Obviously, I was stoked. Would I finally find the lesbian love interest I had hoped for after all these years?

Bioware did deliver a lesbian love interest, a character with a fully-fledged romance, and also available as a companion. Sera, an elf, which has always been my favorite race in any and all fantasy mediums. It was all set up for perfection.

And yet, I despised her.

I think it was a combination of many things. On a purely superficial level, I disliked her design, with her choppy fringe after cutting her own

hair, the kind of fringe I rarely find attractive. It was superficial, perhaps dumb, but it made me upset (which feels like a very privileged opinion to have, rejecting a character for looks). Yet, it was her personality and values that sealed the deal for me. She was written with a clear distaste for the Dalish elves and their customs, and of course I played a Dalish elf that I envisioned as a character safeguarding these old traditions and beliefs. I found myself constantly arguing with Sera and disagreeing with her views and attitude, the complete opposite of my own, and I was unable to romance her and ended up spiteful about her inclusion. If they were going to include a lesbian with such an aggressive and dislikable personality, I would have been better off without any representation at all, I thought.

I ended up romancing Josephine instead, the sweet hearted, bisexual diplomat that sadly wasn't a companion I could bring on quests. Yet her soft demeanor and beautiful dress appealed to me far more than Sera's tomboyish look, and that was the end of my first run of DAI. I learned two things: firstly, that while Josephine was sweet, her romance didn't really cut it for me, and secondly, that I needed to romance Dorian next. In the short time it took for me to complete my first playthrough, I had already heard good things about the character and his romantic arc, which of course piqued my interest. The appeal of the character has been picked up in academic circles as well, for example in Pelurson's article from 2018.

Pelurson states:

> "While video games are now catching up on LGBTQ representation, only a few characters are granted a role that is as significant as that of Dorian" (Pelurson, 2018, p. 1)

As Pelurson claims, the significance of Dorian's character is notable. Criticized by some as a gay stereotype, with his flamboyance, good dress and flirtiness, by others he's perceived as a faithful depiction of LGBTQ individuals and their lives (Pelurson, 2018). The gay narrative surrounding his personal quest has been perceived as "unnecessary and obsolete" in today's day and age by some players, while others claim that Dorian's storyline has helped them navigate their own personal experiences with being homosexual or that Dorian has helped

players understand friends and family that are gay (Pelurson, 2018). His obvious gayness also seemed to annoy some straight gamers, but despite it all Pelurson's study indicates that a majority of forum comments surrounding Dorian perceive him as positive representation for the LGBTQ community (2018).

For me, Dorian clicked. He felt like everything I wanted in a gay character, he shone a light on his experiences, had integrity and charm and looked good to boot (while ridiculous at first, the mustache grew on me). He ended up being my favorite character by far, and one of my favorite romances, but in the wake of these positive feelings I was spiteful that Sera couldn't scratch the itch that Dorian had managed to. While the years have passed since that time, I still look back on Dorian as one of the best LGBTQ characters I encountered in a game, a position shared with Ellie in *The Last of Us*. I played a lot of games since then, but no one with such profound LGBTQ experiences woven into a character's storyline. Yet I found myself asking...did I care? And was my repeated disappointment in lesbian/bisexual love interests available for my female avatar the fault of the game designers, or was it my own?

4. Gayming

Shaw has found that in repeated studies, "gaymers" aren't only drawn to niche media and repeatedly consume mainstream products, and that gameplay is just as, or more, important than representation in games (2009). In Shaw's research, finding a place to experience community was more important for queer players than LGBTQ characters being present in the game, and while gaymers didn't purchase games for queer content, they discussed games where queer content was included (2012).

This explains the constant discourse surrounding the Bioware games, particularly *Dragon Age*, since they are known for attempting to feature LGBTQ characters and romances. Shaw muses in a blog post from 2015 that it's not that gaymers don't care about representation, but rather that they don't care in ways we expect. There is a difference between when we should care about representation and when representation doesn't matter, and a common sentiment was that representation is nice when it happens (2015). Shaw feels that people need to

be in a position where they can demand representation, and that the discussions surrounding representation isn't to achieve something that is perfect, but rather to create a reflection of what we are (Shaw, 2015). This demand for representation is crucial, since it opens up discourse about queer representation in games, and demands for representation have been heard by game developers in some instances.

Mulchay describes how fans, both queer and straight, managed to convince Bioware to insert gay male romances in *Mass Effect 3*, after their notable inclusion of lesbian intercourse but exclusion of gay options for male Shepard in previous titles. Including gay romances create more potential storylines and allows the game world to become more personal to a wider range of players (Mulchay, 2013). Pelurson claims that as a gaymer, the inclusion of Dorian, a handsome mage, was a rare and welcome addition to his gaming experience (2018).

As noted earlier, Dorian was both seen as a positive addition to the gayming experience, while also suffering from stereotypes common for gay men that some found offensive. Some gaymers expressed that no representation is better than stereotyped representation. However this kind of exclusion has been proven to be just as negative as stereotypical presence in media (Shaw, 2009).

Diversity in games matters more to women, nonheterosexual and nonwhite people, and this is proof of the importance of studying consumer diversity beyond the straight, white man (Shaw 2009). This trend is also in line with the focus on studying gaymer communities made up of gay men, to the exclusion of LGBTQ diversity and women and treating them as a sub-group, both in academia and media (Shaw, 2012). Shaw concludes that lack of representation in media is like sending a message that LGBTQ people, their lives, concerns, and thoughts, lack importance (2009), and in a later study also proclaims that focus should shift from gamers and marginalized groups to instead investigate how games operate in the everyday life of both individuals and contemporary media (2011).

I agree that it is important to focus our attention on how games as a medium operate within the daily life of marginalized groups. The impact gaming has on marginalized groups and contemporary media is

something that demands more research, and it is especially interesting when you view games as a vehicle that both reflect our culture back to us and also have the potential to subvert it in spectacular ways. One thing I find to be impactful is to research the effects gaming and LGBTQ representation have on marginalized groups and whether representation can help people find comfort or guidance in their daily lives.

5. Role Models and Character Attachment

Scarcity aside, LGBTQ media representations were proven to serve as positive role models for participants in Gomillion and Giuliano's study (2011). These role models gave the participants comfort and helped them realize their own identities, as well as helping the participants with coming-out. If the role models weren't LGBTQ, they were perceived as outsiders going against the grain in their respective works and were portrayed to be strong and admirable (2011). This coincides with a study conducted by Bradley J. Bond, where LGBTQ adolescents were likely to see their role models as a source of information regarding socialization, and they were more likely to report fictional characters and LGBTQ individuals as favorite media personas than their heterosexual counterparts (2018). Notably the amount of LGBTQ role models reported was still less than a quarter of role models presented by the LGBTQ participants (2018), illustrating the ability of LGBTQ participants to find and identify with models outside their own sexuality.

Participants in Gomillion and Giuliano's study claimed that the presence of LGBTQ media persona made them feel more socially accepted and raised their self-esteem compared to the participants that lacked role models. However, they also reported that seeing, for example, depictions of traditional families dominate media made them feel excluded from society (2011). The LGBTQ relationships presented in media typically follow the conventions of a heteronormative, heterosexual relationship with a dominant, masculine partner and submissive, feminine partner, leaving a gap of representation for queer identities not adhering to these roles (Ivory, Holz Ivory and Gibson, 2009). This overly gendered portrayal of queer relationships might serve as poor examples for queer people in how to model their intimate relationships, due to the lack of non-gendered representation of queer relationships

(Ivory et al, 2009). Ivory et al. state:

> "These gendered portrayals may also serve as poor examples for homosexual viewers to model in their own relationships. Gay male and lesbian viewers, especially those who are in an identity-formation stage, may vicariously learn that one partner should perform a masculine, dominant role, whereas the other should perform a feminine, submissive role". (Ivory et al, 2009, p. 188).

It can be argued that positive representation of LGBTQ characters through a decrease of stereotypes might help challenge the social prejudice towards the LGBTQ community (Gomillion and Giuliano, 2011). More positive portrayals of queer relationships in media, freed from heteronormative gender norms, might also impact LGBTQ individuals positively when learning about themselves and their relationships. Media in all forms have great power to form positive portrayals of queer people, and it has been found in previous research that LGBTQ individuals are drawn to certain narratives.

LGBTQ adolescents seem drawn to characters in sci-fi and fantasy since they are often seen as outsiders being forced to overcome personal and societal hardships to prevail, and more complex LGBTQ narratives can give LGBTQ individuals a way to develop healthy social connections and information (Bond, 2018). Using this attraction to narrative and characters to tell compelling, deep stories about queer relationships and experiences would be a powerful tool to create positive identification and reflection. Games, through their interactivity, are unique in their ability to have people "perform" interactively in a narrative setting with deep characters.

Game characters have been proven to positively impact play experiences and players often develop deep emotional attachment to characters that even might affect the choices made in the game (Bopp, Müller, Aeschbach, Opwis and Mekler, 2019; Kway and Mitchell, 2018a, 2018b; Milam, Seif El-Nasr and Wakkary, 2009; Burgess and Jones, 2020). The players attachment to NPCs, particularly the player's love interest, was powerful enough to have players reflect how they could manipulate game mechanics to strengthen these emotional attachments, all for no

tangible benefit for the game. The focus on love interests in these manipulations support theories that characters available for romance are more appreciated by players (Burgess and Jones, 2020), and romances can be seen as a way to thoroughly engage players in a story as well as help them explore sexuality and romantic interests (Tomlinson, 2021).

I vividly remember playing my way through various games with the intention of doing exactly as the studies mention: manipulating gameplay. A player in Burgess and Jones study mention sending Tali into "the vents" (a crucial part of the final mission in *Mass Effect* 2) only to hear her dialogue and experience her romantic bond with Shepard, as well as players figuring out how to get their love interest to appear more in cutscenes (2020), something I did as well when playing the game. The power of game characters and the way players might attach to them, especially if they are romantically available, cannot be understated, and seem to mirror the positive effects that have been observed in other mediums, as studied by Gomillion and Giuliano (2011).

6. Looking forward

Gordon Calleja asks the question whether video games are escapist, based on the belief that they express an alluring unreality on the other side of a screen, as well as the conviction that games and by extension play are set apart from everyday life, due to not being seen as serious. Yet, he challenges this notion, stating that games are not more escapist than any other activity that engages the performer. While they might provide comfort or avoidance from the unpleasantries of daily life, no activity is escapist in itself (2010).

I thought long about whether my experience diving into video game romances has been escapist or not. Did I find comfort in the game world because I could explore something without repercussions that felt challenging in real life, or was it merely a venue for realizing identity? Or both? Did that encounter with Leliana fundamentally change how I view relationships and their potential, or did it just water a dried seed, nourishing something that I didn't realize I carried?

Bonnie Ruberg and Spender Ruelos report that a striking 83% of LGBTQ respondents had experienced a change in their sexual identity

from being teens to their present. This is notable, since it shows that a majority of LGBTQ people often experience their own sexuality and gender as something that is fluid and changes over time. Identity is the opposite of fixed and singular for these individuals (2020).

I often pondered, even experienced impostor syndrome, over the fact that I felt drawn to male romance options in games, and in particular male romances I could experience through a male character to exercise a desire for a relationship diverting from the heteronormative rules of society without exposing myself too much. At least, this is how I might look at it today, but at the time it was a confusing experience and I doubted both my sexual identity and my part in the LGBTQ community.

The last romance I experienced in a game was in *Mass Effect: Andromeda* (2017), a game I only played once. It didn't hook me, for a truckload of reasons, but I did enjoy romancing the female turian Vetra with my female Ryder, albeit a bit disappointed that she wasn't exclusively available for the female Ryder. Looking back, I don't have much to say about that play experience, except that it happened. It was nice (probably the only nice thing in that game).

Going into academica, I feel myself drawn to the topic of LGBTQ experiences and queer play, as well as character portrayal because I sincerely believe games can become an even stronger tool to allow people with non-normative identities explore their identities. Like the 83% of LGBTQ people that reported changing their understanding of their identities in Ruberg and Ruelo's study, I did as well. I went from being a clueless teen, to identifying as bisexual for a few short weeks, to living as both a closeted and then fully out lesbian for years, to eventually looping back and identifying as bisexual again.

Now living in a relationship that looks like any other heterosexual relationship on the outside, it makes me doubt if I even deserve to, or should conduct research regarding queer lives and queer play. Yet I went through the whole loop of identity discovery, the stress of being closeted, the plunge into unknown waters when coming out, the lingering looks when being out and about with a woman partner. At least to some extent I understand what it means to be stared at, to not feel seen in media, to wish and beg for inclusion in your favorite medium

and to hide a part of yourself that feels integral to your identity. Yet my privilege is immense, being cisgender, white, raised in a progressive and tolerant country and now partnered with a man.

When asked what LGBTQ people would like to see more in media, the participants in Gomillion and Giuliano's study answered more realistic portrayals, LGBTQ characters living normal lives and just being gay (2011). I believe that would be wonderful. I also believe characters like Dorian, with their stereotypical flamboyance but enriching emotional expressions and naked portrayal of their sexual identity, are needed as well.

We need to move LGBTQ characters into normalcy, not as tokens or characters to preach about, as Shaw suggests (2009). I believe Ellie from *The Last of Us* is a good example of a character that just happens to be gay. She doesn't feel like a token gay character, and neither is her sexuality used for controversy (even though some did take offense at her lesbian kiss and went to great lengths to reassure themselves that the kiss was platonic (Berardi, 2017)). Bill, from the same game, follows the same spirit as Ellie. He just existed, and being far from the stereotyped gay man, it was a refreshing twist.

With game characters and media figures being proven over and over again to help minorities understand themselves and provide an outlet to learn and love, it is crucial to continue the fight for increased diversity and nuance in gaming. Queer game studies are integral in deepening the understanding of games, play and queer identity. All gamers deserve to be heard, and the gaymer isn't someone removed from the general public; they are a part of it, and I certainly look forward to the next queer romance that will hook my interest.

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Diana Cristina Răzman is a narrative designer passionate about interactive storytelling, user experience, and wacky games. Having studied English literature, media, digital narration, and GUX, Diana has an extensive background in Arts and Humanities. She is interested in using this knowledge to bring a humanistic approach to the way digital games are developed, played, and studied. Other interests include: being chaotic and growing plants.

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Evan Barba is an Associate Professor in Georgetown University's Communication, Culture, & Technology Program and co-director of CCT's Iteration Lab. He has been deeply committed to interdisciplinary and collaborative inquiry for the entirety of his career. Evan has combined undergraduate degrees in neuroscience and media theory, added computer engineering and video production in his Master's thesis on computer vision, and revisited media theory in combination with spatial psychology and computer programming in his Ph.D. dissertation. Most recently, he completed a five-year research project building robot user interfaces for NASA's Satellite Servicing Projects Division, and has begun work on regional resilience planning for climate change and scenario design for virtual reality law enforcement training.

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Felix Enekvist Redig is a non-binary artist and master student at the University of Skövde, with a bachelor's degree in informational science and 2D Game-art. Primarily an artist, they share a similarly deep appreciation for research pertaining to the same field. Previously, Felix has written a thesis on hegemonic masculinity and its storied past's impact on the present day's creative mediums, which has in turn has served as a springboard from which they continue to explore the world that LGBT game developers such as themselves navigate.

Linnéa Eklund

Linnéa Eklund is a game writer that's currently working towards their masters' degree in game development. When not studying they can usually be found trying to complete a story-driven game, working on cosplay, or writing short stories. A love for games and narratives was what drove them to start studying game development, and through their studies they gained an interest in how games can affect the players. That was how they found the area of accessibility in games. Which they wanted to dive deeper into, and in the chapter they made for this book, demystify and introduce to developers and people who may not have encountered the area before.

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Maurice Lamb, PhD is a Senior Lecturer in Informatics at the University of Skövde. His background is in philosophy, cognitive science, and robotics. His research aims to understand how humans interact with one another and how insights from human-human interaction can improve human-technology and human-robot interactions. He has worked with virtual reality for scientific research for the past 8 years, primarily using VR as a test bed for testing artificial agent interactions with humans.

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Nahid is a game developer and recently received her Master's in game development from the University of Skövde. Her background is in software engineering but game development is something that she enjoys the most. She believes games have remarkable effects on their players and considers them as a tool to increase players' awareness. VR development is another area of interest for her.

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Sandra Alexandersson is a master student, currently studying game development at the University of Skövde after finishing her bachelor's degree as a game writer. She is particularly interested in narrative, literature, queer gaming, romances in games and games potential to aid in identity-seeking processes, and wrote her bachelor's thesis on how a queer romance in a primarily narrative driven game would be perceived by players. Following this research, Sandra has taken more interest in queer gaming and also dipped into researching game writing careers, and aims to further research narrative in the future.

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Dr. Souvik Mukherjee is Assistant Professor in Cultural Studies at the Centre for Studies in Social Sciences Calcutta, India. Souvik's research looks at the narrative and the literary through the emerging discourse of videogames as storytelling media and at how these games inform and challenge our conceptions of narratives, identity and culture. Related interests and expertise include a broad spectrum of topics in Game Studies ranging from identity and temporality in videogames to the videogame industry in South-East Asia. Currently, he is researching how videogames relate to Postcolonial Studies and separately, also how certain ancient Indian board-games contribute to the understanding of gameplay. Souvik is the author of two monographs, Videogames

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Veronica Johansson is a Master level student in Games Research and User Experience at the University of Skövde, who is interested in understanding players and their choices both in-game, and in the real world. She was part of creating the game called Mor – The Game and received a Bachelor's degree in 2D graphics for video-game development from the University of Skövde. In her free time, Veronica is usually found working on one creative project after another, and is currently spending her time – while not studying – on creating a visual novel with a group of friends. Veronica's chapter in this book is meant to encourage junior GRUX researchers on their journey, and to push them to really consider why they use certain methods in their studies.

Weijia Huo

Weijia Huo is a masters student now studying Game Development at University of Skövde, having previously graduated from Shanghai Normal University with a major in Game Animation.
Weijia was born in China at the end of the 20th century. While growing up, she was exposed to the gradual development of games and became interested in them. After being exposed to the Swedish gaming environment and education, she started to think and compare. After completing her masters degree, Weijia plans to enter the game industry and continue her exploration as a 3D artist involved in game production.

Wilmer Tjernberg

Wilmer Tjernberg is a UX designer and researcher currently working at Frame Break. He received his master's in games user research from the University of Skövde.

Ziwen Song

Ziwen Song, aka Michael Song, is a master's student at the University of Skövde studying games research and user experience (GRUX). In addition, he practices in game design and level design and is interested in game studies and game history. He also worked with two indie studios in China as their PR dude and community manager.

Ülkü Kutluhan Bayrak

Ülkü Kutluhan Bayrak is a master student at the University of Skövde, Sweden studying Game Development with an emphasis on Game User Experience. Prior to his master's, he studied Psychology at Sabanci University in Istanbul, Turkey. His never-ending passion for games started ever since he first touched the Game Boy Advance his family bought for him. He now aspires to work and make a difference in the industry that built his passion. Currently, Kutluhan is writing his master thesis on game review motivation. You can check what he is up to and his work on kutluhanbayrak.com.

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