Experiential Depression and Anxiety Through Proceduralized Play: A Case Study of Fragile Equilibrium

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INTRODUCTION

In this article we examine the portrayal of depression and anxiety in games that seek to utilize an experiential, metaphorical approach to the representation of these conditions. We theorize that, in addition to games that address these topics through more traditional, literal narrative and avatar-based representations, there are effective design methodologies that utilize abstract, experiential designs to provoke an emotional resonance and understanding of these conditions rather than depictions of characters who are depressed or anxious. To explore this concept, this article examines *Fragile Equilibrium* (Phelps, 2018a), a highly emotive (and carefully crafted) game that evokes concepts and emotional states such as depression, anxiety, and melancholy entirely without the use of characters, dialogue, or narrative. *Fragile Equilibrium* serves as a case-study for designed interaction that utilizes experiential gameplay. Its game mechanics seek to relate emotions, feelings, and perhaps even empathy through played experience. To date, *Fragile Equilibrium* is one of very few games that engages with mental health through experiential gameplay

rather than narrative development, and thus it provides a unique point of reference when addressing complex issues of mental health through games and interactive media.

In considering this design methodology and its use in *Fragile Equilibrium*, this article first explains the concept of experiential, metaphorical games in general and why they might be effective given relevant design and learning theory. Then it examines the design and development of *Fragile Equilibrium* as an example of this kind of game. Following that examination, this article compares and contrasts how this game works similarly or dissimilarly to other games that have attempted similar representations of mental health. Finally, it examines player reactions to the game to determine whether this portrayal was effective in conveying the message to players beyond the design team. By examining *Fragile Equilibrium* through its gameplay, mechanics, and aesthetics, the authors argue that such experientially focused designs can be effective in portraying nuanced depictions of mental illness in ways that differ from more literal representations and can be effective in creating a sense of emotional resonance as a way of engaging players in these topics.

APPROACH, BACKGROUND AND TERMINOLOGY

Emotional resonance is, in itself, a form of education. It builds appreciation and understanding for others' experiences, including with depression and anxiety. Games that draw on emotional resonance can engage players in self-reflection and consideration of their relationship with these themes and topics. In this manner, *Fragile Equilibrium* represents a kind of game that is of increasing interest in the field: an experiential educational game. This kind of game is premised on the notion that players can gain an understanding of and empathy for a given scenario or subject matter merely through the act of playing it, and specifically through the act of *interacting* with it. Examples of such games include exercise games that require players to engage in cardiovascular exercise (Rusch, 2017), exploration games that take place in geographic regions such that the geography is assimilated rather than explicitly taught (Davis, 2020), or games such as *Splattershmup* (Decker, Egert, & Phelps, 2016) where players construct a painting simply by moving around and thus learn about motion

as it relates to action painting. Experiential educational games are in contrast to more traditional games for learning in which specific subject matter is represented more literally through the content of the game, often overtly so.

In considering the design methodology of emotional resonance and the representation of mental health in such games, the question becomes: to what extent can a game convey the feelings of various mental disorders to players and what would this mean if it were effective? Rather than having a player know more about a given condition from the perspective of clinical knowledge or fact-based recall, to what extent can games help to convey the actual feelings associated with disorders such as depression or anxiety? To explore these questions, this article examines *Fragile Equilibrium* as a case study from a design perspective, in the structure and format of design literature. It presents the background issues and motivations to consider these questions, examines the issues and themes that informed the design of the game, describes the design of the game itself, compares and contrasts the design of the game with others that are similar in one form or another, and explores the reception of the game and its effect with an audience. In this manner, this article offers a working example and post-mortem, examining the research question of whether such portrayals can be effective towards the goals just articulated.

Depression, Anxiety, and Mental Illness

It should be noted that the authors of this article are neither clinicians nor experts in mental health; they are game designers and developers. In considering their examination of this subject, and the perspective from which they examine it, it is important to establish working definitions of the terms depression, anxiety, and mental illness. This will help to more accurately dissect how *Fragile Equilibrium* functions with its portrayal of these concepts and how this portrayal is and is not similar to other such efforts in video games.

Depression is a mood disorder which can disrupt daily life. Those who suffer from depression experience persistent and recurring feelings of sadness and hopelessness over time, and may lose interest in activities

they previously enjoyed engaging in (Barnhill & APA, 2014; Mayo Clinic, 2018; Roehr 2013). Aside from the emotional problems caused by depression, individuals also can present with physical symptoms such as chronic pain or digestive issues. Although depression as a diagnosis embodies more specificity of these symptoms and the precise symptomology and rubrics for identification and evaluation have evolved over time (Bech, Gram, Reisby, & Rafaelsen, 1980; Fried, Epskamp, Nesse, Tuerlinkx, & Borsboom, 2016; Jablensky, Sartorius, Gulbinat & Ernberg, 1986; Zimmerman & Coryell, 1987), the above tenets are generally understood by the public as facets of depression. Depression and sadness are not synonymous. Persistent feelings of hopelessness and loss of interest and engagement for extended periods are symptomatic of those that suffer from depression (Parekh, 2017). These characteristics can therefore be used to explore depression as it functions within games aimed at a popular audience, both as a narrative device and as an experiential tool.

Although depression is the main theme of *Fragile Equilibrium*, anxiety is a condition that is often experienced in conjunction with depression (Alloy, Kelly, Mineka, & Clements, 1990). As such, it is useful to analyze the presence of anxiety in games about depression in order to deconstruct the different components of the two disorders and how they tend to function together. Anxiety, or Generalized Anxiety Disorder (GAD), can be described as persistent and excessive worry that interferes with daily activities, is present for an extended period of time, and is accompanied by physical or cognitive symptoms such as restlessness, fatigue, impaired concentration, irritability, muscle aches or soreness, difficulty sleeping, and more (APA, 2013; Glasofer, 2019). Again, while the nuances of symptomology, subclassification, and diagnosis are not always well-popularized, there exists enough of a public understanding of these basic symptoms and associated feelings that games engaged with these topics can resonate.

While depression and anxiety are specific conditions, mental illness is an umbrella term that encompasses both as well as a wide variety of other disorders. How mental illness is referenced in this paper is closely related to the National Institute of Mental Health's (n.d.a) definition of *Any Mental Illness* (AMI) as, "a mental, behavioral, or emotional disorder. AMI can vary

in impact, ranging from no impairment to mild, moderate, and even severe impairment." Importantly, this definition adopts a clinical, analytic lens. Mental illness is often referenced in media as a caricature that embodies a hodge-podge of inflated symptoms, often relying on stereotypes, tropes, and characterizations that are damaging both to the public understanding of mental illness and destructive to inclusion for individuals suffering from such conditions (Shapiro & Rotter, 2016). The authors of this article want to make clear that this stereotyped image of mental illness is not the one being referenced throughout this work.

Experiential Games and Learning Theory

While there are multiple narrative-based games about depression on the market, many of them use a slice of life tactic, in which players engage and grapple with the topics of mental illness through the eyes of the character they play or through the surrounding characters in their world. The narrative in these games is arguably sympathetic (in that the player sees depression through the eyes of their character) rather than empathetic (in that the player feels the constraints of depression and anxiety through experiential gameplay). *Fragile Equilibrium* is unique in that it examines depression and anxiety through an experiential lens—players must practice balance between internal repair and external defense in addition to operating within an environment that increasingly becomes more hostile and decayed. In this sense, *Fragile Equilibrium* is evocative. Perhaps the player will not exit the game with a fundamental understanding of depression and anxiety as medical terms, or even societal concepts, but they likely will experience the emotion, constraint, and pressure designed into the game's system, and ideally reflect on their own experiences as modeled within the gameplay. From a design perspective, whether or not the player makes the connection between *Fragile Equilibrium* and depression is not as important as the feelings elicited by the game. It is, after all, the varying interpretations of art which weave a wider, more nuanced cultural narrative. *Fragile Equilibrium* gives the player the tools to empathize with depression without explicitly relating the theme to the player, thus allowing players to draw their own conclusions from within their own experiences.

The experiential gameplay model utilized by *Fragile Equilibrium* stems from the concept of experiential learning, which has been used as an effective teaching tool in education (Kiili, 2005). More recently, experiential learning has been studied in conjunction with games. The potential of this tactic in the medium is rife with possibility. This model was initially proposed by Kristian Kiili 2005), who attempted a synthesis and/or integration of traditional experiential learning models in education with the concept of "flow", (as put forward by Cziksentmihalyi (1990) and discussed below. He then applied this notion to the field of gaming to theorize an experiential gaming model. In order to understand the precepts of experiential gaming, it is important to understand its roots in both learning models and its connection to the phenomenon known as flow.

Although the concept of experiential learning as defined by Kolb, Boyatzis, and Mainemelis (2001) has been in practice for some time, its applications to interactive video games are relatively new. Traditionally, experiential learning models utilize four steps that help to cement concepts and ideas in the minds of those using the model: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, Boyatzis, & Mainemelis, 2001). According to Kiili (2005), "the model stresses the continuous nature of learning and the appropriate feedback which provides the basis for a continuous process of goal-directed action" (p. 17). In other words, the experiential learning model promotes uninterrupted engagement with certain concepts, cementing them through repetition and iteration within the learner's own experience. It allows learners to discover the concept on their own terms, rather than focusing on rote memorization or regurgitated theories. This idea of self-directed learning and self-actualization along a non-predetermined path of knowledge acquisition and reflection also has roots in both constructivism (Campbell, 1999; Papert, 1991; Powers & Powers, 1999; Puntambekar, 1999) and constructionism (Brooks & Brooks, 1993; Edwards, 2005; Vygotsky, 1987). But experiential learning on its own faces some shortcomings, primarily in that it is not inherently, or not necessarily by definition, deeply engaging. Kiili (2005) suggests that the solution to this problem lies in *active* gameplay and the careful cultivation of an environment which encourages flow. The application of flow to educational learning environments has been utilized

before and has shown positive trends in human computer interaction learning contexts (Webster, Trevino, & Ryan 1993).

While more recently applied to experiential learning models, the concept of flow is well established. Psychologist Mihaly Cziksentmihalyi (1990) proposed term "flow" as "the psychology of optimal experience," a concept that has informed the literature on games, play, and education (Cowley, Charles, Black, & Hickey, 2008; Kiili, de Freitas, Arnab, & Lainema, 2012). In Kiili's (2005) theory, he sums up Cziksentmihalyi's concept of flow as an *optimal experience*, one which completely captivates the mind and body, such that one becomes singularly focused on a goal and the exhilaration which accompanies the pursuit of that goal. Flow is often referred to as "being in the zone," and in some sense can be said to compound experiential learning in that it drives the learner to continually cycle through the four steps outlined above in order to reach their goal. It ensures that activities do not become boring or too repetitive. Cziksentmihalyi (1990) postulated that activities can be designed to promote flow by ensuring that levels of skill and challenge were equally matched; too much challenge causes anxiety while a lack of sufficient challenge causes boredom (Kiili, 2005).

Both this notion of effectively balanced challenge and of cycling through the stages of experiential learning are specifically applicable to designing experiential gameplay. Experiential gameplay is all about problem solving and discovery learning (Kiili, 2005). This means that ideas and procedures are uncovered through repeated effort. Discovery learning doesn't just happen. In order to fully engage the player and reinforce concepts within a game, games must directly provide clear feedback, and offer well-defined goals and challenges that are on par with a player's skill level at any given point (Cziksentmihalyi, 1990; Kiili, 2005). This mirrors the learning concepts as put forward in the idea of the zone of proximal development (Vygotsky, 1987). This is further explored by Gee (2004) in the context of networks of players, and also by Squire (2003) in the context of the engaging nature of video games as a medium.

From a design perspective, the more interactive the game, and the better the game situates itself to the position of the player on a balance of repetition, challenge, and reward, the more a player has the opportunity

to encounter concrete experiences, reflectively observe the circumstances, abstractly conceptualize solutions to obstacles that arise, and put those concepts into practice with active experimentation. Numerous successful role-playing games demonstrate these active choices over and over again throughout the course of play. But these precepts only provide the foundation for the experiential gameplay model. As experiential gameplay seeks to conjoin gameplay and experiential learning to foster flow, such games must also seek to acknowledge both cognitive and behavioral exercises as applied to learning, a notion which acknowledges constructivist (Phillips, 1995) and pragmatist (Kivinen & Ristelä, 2003) theories (Kiili, 2005). In order to foster the previously mentioned four phases, experiential games create three scenarios through which these edicts are performed: ideation loops, experience loops, and a challenge bank (Kiili, 2005). In other words, the game regularly presents new challenges, the solutions to which are not immediately evident to players. Players must then conceptualize new and innovative solutions to these challenges (resulting in the ideation loop) and put them into practice.

Once an idea has found purchase and has been successfully performed, players can continue to use this solution for a short while, thus lingering in the experience loop. Kiili (2005) notes that the challenges presented must continue with regularity and incrementally increase in difficulty to force players back into the ideation loop. If players spend too long in the experience loop, the game becomes too repetitive, and thereby less engaging (Kiili, 2005). In addition, Kiili (2005) also suggests that games must have good storytelling, provide balanced gameplay, and furnish an attuned cognitive load in keeping with earlier notations by Squire (2003). In short, experiential games should be immersive and balanced without overwhelming players with too much information or providing too little information to be interesting. With all this in mind, it is important to note that while experiential gameplay is pivotal in cementing concepts in the minds of players, experiential gameplay alone does not inherently make games meaningful or emotionally resonant. For a game to truly be impactful in this context, for it to challenge the preconceived notions brought to the experience by the player, and for it to resonate within them, games must also be deep.

Towards a Deeper Design Approach

Before fully analyzing the nuanced definition of deep games, it is necessary to break down the preconceptions surrounding both authorial intent and meaning derived from media. It is certainly possible to argue that meaning can come from a variety of sources and that any game can become significant to specific players. And this, to some extent, is true. Because individual players are informed by their own lived experiences, their experiences may resonate with any number of factors within a game. However, this is wildly difficult to quantify when designing games—it is impossible to know, for instance, that a player may have a fear of the ocean. This could turn a relatively benign game, such as *Subnautica* (Unknown Worlds Entertainment, 2018), into a horrifying experience. This does not mean that the extrapolations of players are incorrect, or should be dismissed out of hand, it is only to suggest that when designing a game, designers should focus on honing their intent such that it is imbued in the game directly as much as possible, while still allowing for the individual lived experience of the player to inform their interpretations.

Hedonic gratification focuses on the pleasure derived from gameplay in all its multi-faceted forms (Oliver et al., 2015). This notion of gratification, while an important component for games in general, does not inherently make a game meaningful in and of itself. To put this more bluntly, pleasure derived from gameplay is certainly important in the design and experience of games, else why play them, but it is not necessarily a factor that contributes to meaningfulness. Studies have shown that media can fulfill innate psychological needs, such as autonomy, competency, and relatedness (Huta & Ryan, 2010). Additionally, Oliver et al. (2015) determined that eudaimonic gratification, which can be characterized as appreciation rather than pleasure, is also a necessary component for meaning derived from games. The more a player can become engaged with the game, from mechanical representation to the connection they have to the themes within the game, the more meaning can be derived from the game itself. The concept of eudaimonic gratification represents the meaning and insight that comes from the game and is thus able to solicit emotion and raise questions about the "human condition" (Oliver et al., 2015). By cultivating insight and appreciation within players through their games,

designers can attempt to stimulate the minds of their players and hopefully impact them on a deeper level. With this in mind, one can begin to create systems for eudaimonic gratification within games in order to foster meaning.

Furthermore, it is not sufficient as a design paradigm to superimpose meaning on a game in the middle or tail-end of production. Deep games must intentionally establish what experience they wish to convey—they must firmly institute a theme, a point of reference which informs all else right at the beginning (Rusch, 2017). It is from this point of reference that meaning originates and trickles down through the game. This happens from code to mechanics, from art to worldbuilding, and from individual elements to cohesive design. Deep games rely on themes to create resonance with the player, drawing on their experiences with culture, past experience, shared mythology, purpose, and humanism to create a context from which to experience the game world. Doris Rusch (2017), games scholar and author of *Making Deep Games: Designing Games with Meaning and Purpose* posits that metaphor can be used to imbue meaning in games. The use of metaphor in gaming lends itself to the framework of experiential gameplay since it is meant to stimulate reflective observation and active conceptualization. Metaphor veils its true meaning for us to discover through our own participation.

The construction of metaphor lies in the linkage between what is concrete and what is inferred. Rusch (2017) specifies that "[s]tructural metaphors are no imaginative flights of fancy. They constrain the meaning of abstract experiences in a very precise and coherent manner, by virtue of their mutual, unified structures" (p. 54). The use of metaphor thus serves as a cognitive tool used as reference and inference in order to transform the abstract into something tangible, something that has reference within the real world. It is the notion of actively engaging with embodied experience, which Rusch (2017) describes as taking place in the body or the mind, that makes sense of metaphors. Games provide an interactive embodied experience—the presentation of choice and the element of skill in games creates an immersive environment through which players can simulate this phenomenon. Practically, this functions through the representation of abstract concepts by way of mechanics. Rusch (2017) argues that

mechanics are a vehicle for metaphor in games, referencing many examples in order to support her claim, including the grappling mechanic in *God of War* (Sony Interactive Entertainment, 2016) as metaphor for periods of transition, the exponential falling tetrominos of *Tetris* (Pajitnov, 1984) as an analogy for overwrought Americans struggling under the weight of capitalism, or the slingshot mechanic in *Angry Birds* (Rovio Entertainment, 2009) as alluding to anger, repression, and vengeance. These instances allow player agency in the game to be mapped onto the experience through the tangibility of real-life circumstances (Rusch, 2017).

Situating Fragile Equilibrium as a Designed and Authentic Experience

It is through experiential metaphor that *Fragile Equilibrium* strives to tell its story: while the in-game mechanics serve to provide balance and challenge, they are also used as a metaphor for depression. Andrew Phelps (2018b), designer of *Fragile Equilibrium*, notes in his artist's statement:

> [*Fragile Equilibrium*] is not a game that teaches someone about depression, it is not a game that aspires to educate someone or empower someone or God-forbid claim to cure someone. It is not a game that directly addresses its subject: it intends instead to evoke a feeling, a nostalgia, a sense of something... (2018b, para 19)

This "sense of something" is meant to evoke a sense of depression as defined above through the experiential metaphor model (Rusch, 2017). It is through the use of mechanics within *Fragile Equilibrium* (described in detail later in this article) that the player participates actively in the metaphor and creates connections to their own lived experience. It is also these mechanics, in concert with a variety of other elements, that serve to establish *Fragile Equilibrium* as a meaningful game. However, *Fragile Equilibrium* also draws from the conventions of games that traditionally have ignored or dismissed deeper readings. It is also important to take Phelps' (2018b) statement in context with the aforementioned discussion of learning theory: he is challenging the notion that educational intent must be realized in overt learning objectives, in facts or figures presented in a formalized way with associated assessment. He is implying the notion that the game is intended to be *felt* rather than to be *read,* and that the learning is thus experiential and emotional.

While all of the elements above foster a sense of challenge, and a meaningful base for the narrative, it is important to remember that the vehicle for these concepts is a game and should present itself and function as such within its medium. But what does it mean to function as a game? The potential and possibilities of games are continuing to expand almost daily, with designs that challenge the status-quo continuing to reach new and more varied audiences all the time. Indeed, the entire notion of deep games springs from experimental work at the edges of more traditional game design, and as will be explored later in this article, games increasingly are exploring difficult concepts such as mental health in new and unique ways. And yet, how deep games that explore mental health are viewed by audiences is also increasingly complex, and the ways they are experienced and reflected upon by players is sometimes sharply divided. *Night in the Woods* (Holowka, Benson, & Hockenberry, 2017), for example, was acclaimed by players, fans, and critics alike, whereas *Depression Quest* (Quinn, 2013) was well reviewed critically, but audience reaction was divided sharply as the game sought to expand the role of games and their potential space for art and intervention. Indeed, *Depression Quest* was singled out as a case example of a non-real game during the GamerGate debacle (Johnston, 2014; Salter & Blodgett, 2017; Smith, 2013) in ways that were toxic and destructive not just to its primary developer, Zoe Quinn, or the idea of engaging with the topic of depression and anxiety through games, but even to the medium as a whole (Grant, 2014; Kluwe, 2014). Both of these examples are discussed further in the following sections.

The term "real game" stems from the constitutive rhetoric surrounding video games as a medium. By using the term "real game" in the context surrounding games, gamers, and game culture, the prefix of "real" presumes that there are games that do not qualify as games, at least for some groups, creating dissonance within the larger gaming community (Consalvo & Paul, 2019). The designation of real or not real often affects the reception a game receives within the community from both players and critics; it can cement a game's status in the community or embroil it in contention and debate. There are a number of societal factors that go into the determination of what makes a real game, and what qualifies a game as not real, such as the prestige of the developer, the platform on which it was released, the content of the game, and even the game's

cost (Consalvo & Paul, 2019). Further, there are many genres and facets of games that more or less fall on one side of the "real game" spectrum. For instance, Consalvo and Paul (2019) note that narrative-focused games, such as walking simulators, are often points of contention within the larger community; reviewers and players alike can be at odds with the notion of narrative-heavy games as real games. While the authors of this article do not take the position that walking simulators, mobile games, or games by certain publishers should not automatically qualify as "not real" games, we wondered whether more "traditional" game genres, tropes, and mechanics could facilitate the expression of deep, meaningful experiences. Additionally, the use of less controversial mechanics, as seen in *Fragile Equilibrium,* potentially have a better chance of reaching a wider audience.

As an arcade shoot-em-up ("shmup"), *Fragile Equilibrium* is fast-paced, challenging, and was released on a variety of notable platforms (namely XBOX One and Steam), all qualities which do not push the current boundaries between "real" and "not real" games. Again, it should be noted that its narrative is told through mechanics and aesthetic design rather than written or oral storytelling. It draws deeply from the history and design aesthetics of older games in the genre from which it springs. In this way, *Fragile Equilibrium* stays within established conventions of its genre. At the same time, it is also a deep or meaningful game. For more astute players, this may inspire a further line of thought about what constitutes a real game, and what games can aspire to. As Consalvo and Paul (2019) have written, "testing the boundaries of an established category changes how we conceptualize the category in the first place" (p. 117). By establishing itself as a new type of game that builds upon the traditions and mechanics of a traditional genre, *Fragile Equilibrium* challenges the design space of what such games are capable of and their extended purpose.

THE DESIGN AND DEVELOPMENT OF FRAGILE EQUILIBRIUM IN DETAIL

With a fundamental understanding of the factors that shaped *Fragile Equilibrium* and the approach and background to its design, it is useful to examine the game itself: how it is played, the context surrounding its creation, and the inspiration behind the specific design elements within the

game. In addition to being unique as an experiential game that engages with topics regarding mental illness, *Fragile Equilibrium* is also uncommon in that it was created in a classroom environment. *Fragile Equilibrium* was the third major studio project at the Rochester Institute of Technology Center for Media, Arts, Games, Interaction and Creativity (MAGIC) with the help of students, faculty, and employees of MAGIC Spell Studios (RIT MAGIC Center, n.d.). It uses unique shoot-em-up ("shmup") elements in novel ways that are carefully balanced and that help reinforce a unique metaphor for depression and anxiety.

We note the fact that *Fragile Equilibrium* was developed academically, in a classroom environment, for two significant reasons relative to this larger discussion. First, this was the first time that several of the students who aided in the development of the game had considered how to encode specific themes of depression and anxiety in a design of their own, even though some had played other commercial games that incorporated these themes. Second, several students self-identified that they either suffered from depression and/or anxiety themselves and/or knew friends and family members that did so. This meant that the design was informed not just by Phelps' vision, but also the backgrounds and experiences of several members of the design and implementation team.

Mechanics and Metaphor

Fragile Equilibrium is styled like a traditional shmup. The player controls a ship that makes its way from left to right through a scrolling world while navigating an ever-increasing onslaught of enemies (flying at the player from the right side of the screen) throughout gameplay. Survival depends on the player's ability to dodge, weave, and return fire with a variety of the ship's weapons. If a player's ship is hit, the player loses health. Heretofore the gameplay is pretty standard, but *Fragile Equilibrium* introduces an uncommon mechanic: enemies that get past the player crash into the left side of the screen, first shattering and then breaking off portions of the playable area. In a game that calls for constant movement, the detriment to the playable area greatly impacts play and the odds of a player's survival. To this end, *Fragile Equilibrium* has a *mend* mechanic, in which players can face backwards and repair their world, slowly restoring

the playable area and giving themselves room to maneuver again. Additionally, repairing the screen recharges the player's weapons, which then creates a strategic dilemma: players that have taken little damage to their screen must allow for some damage so that they can refresh their power levels. The balance to this mechanic is that players cannot mend the screen and continue to fire at enemies concurrently: they must focus their efforts on what is most pressing at the time and continually make judgement calls regarding the best tactic at any given point in the game.

This balance between external defense and internal focus and repair is meant to challenge the player's expectations of constantly fighting incoming projectiles. It pointedly differs from the normal shmup practice of having enemies arrive from a single direction, and it provides a secondary survival mechanic that is ever-present and needs constant monitoring and attention. As noted previously, this mechanic, along with other elements of the game, is meant as an experiential metaphor (as described by Rusch, 2017) for depression, mental health, and self-care. Players must at once both 'deal with' the normal 'shmup world' (i.e., the incoming and persistent external enemies and projectiles as shown in Figure 1), but also with the need to (literally) turn around and focus on their own view of the game world that is literally breaking apart, as shown in Figure 2. In this sense, the game invites players to reflect on external and internal conceptualizations of the world.

Figure 1: Fragile Equilibrium in both shmup mode.

Figure 2: Fragile Equilibrium in repair mode.

Both the shmup and mend mechanics, which are heavily repeated throughout the game, exemplify the amplification of metaphor through repetition (Bogost, 2007). The game's shmup mechanics are contrasted by the calming color palette and serene (although still energetic) music. These elements serve to accentuate the harsh and brittle reality of the world breaking around players and the chaotic dance they are forced into as the game goes on. This further stimulates reflection on the external vs. internal dynamic: something may appear calm and scenic at the outset but can quickly evolve into internal pandemonium. In this manner, the game effectively uses the navigation (and compression) of the environment to stage a dramatic and repeatable story that has similarities to the way that space is often used in conjunction with more traditional game narratives (Fernández-Vara, 2011). The elements of the game work in concert to reinforce the parallel with depression and anxiety: there is a constant need to self-regulate and self-repair, as well as address continual attacks from outside forces, a harsh juxtaposition to the soft colors and serene music that provide a backdrop. The feeling of anxiety is heightened as, inevitably, more of the screen is eaten away and the player's movements are restricted over time.

Development and Release

Fragile Equilibrium was released on Steam, itch.io, and XBOX One in January 2019 after a development period of nearly two years. It was also shown at Miami@Play (Filmgate Miami, 2018), the ICA Games "Ante-Conference"

(International Communication Association, 2019), and Adobe MAX (Adobe, 2018) in regards to its inventive use of Adobe XD during the design process. It was shown at the Open World Arcade (Akron Art Museum, 2019) in connection as a part of the Open Worlds: Video Games and Contemporary Art exhibit at the Akron Art Museum. The game was the winner of the Award for Visual Excellence at the art showcase at the 2019 International Conference on Interactive Digital Storytelling (ICIDS, 2019). The game is rated E for Everyone by the Entertainment Software Ratings Board (ESRB) and is free to play on every platform for which it is available.

Design Inspiration and Artistic Intent

The inspiration for the game came from a number of seemingly disparate sources, and through these design elements, the designers attempted to create a post-apocalyptic nostalgia (Fuchs, 2016) for the time where shmups peaked in popularity. Artistically, the game draws heavily from 1980s fantasy art and music, other shmups such as Treasure's *Ikaruga* (Sega, 2001), Kaihatsu's *Rai Den* (Temco, 1990), and Irem's *R-Type* (Nintendo, 1987), as well as the artistic style of Roger Dean album covers (Dean, 2008; Dean, 2009). Additionally, the game features a nod to the Wabi Sabi aesthetic (Koren, 2008), which is "loosely translated as 'the recognition of the beauty of the imperfect'" (Phelps, 2018b, para 22). The enemies and levels of the game itself become imperfect over time, in addition to the more literal decay of the screen itself. All of these influences work together to create an odd tranquility, even as the world crumbles around the player. It is this passive sense of serenity, beauty, and decay that positions *Fragile Equilibrium* as a vehicle for melancholic reflection. It is meant to evoke emotion and contemplation through every aspect of the world. The player is meant to find beauty and meaning within the confines of the game.

Phelps' (2018b) extended artist's statement yields further insight to the game's genesis, as well as its intended outcome. In the statement, Phelps notes that the game is supposed to straddle the line between calm and chaos, a constant balancing act between self-reflection (which repairs the world around the player and replenishes supplies) and active engagement with the present (which protects the repairs the player made and supports progress through the game). Phelps notes that the game provides a sense

of power, agency, and control in this balancing act: depression is often characterized as solely a negative function, but some artists, musicians, and philosophers claim that their depression has informed their creativity and empathy. It is this sentiment of self-reflection as a tool for growth and healing that is pivotal not only to those with depression, but anyone who engages with the nuances and tribulations of life (Phelps, 2018b). This forms the basis of the mend aspect of the metaphorical action in the game. For the purposes of this analysis, it is perhaps enough to suggest that self-reflection in the face of adversity is a common ground for humanity, a place where one can draw empathy and relate to those who face different challenges. Phelps (2018b) concludes with his interpretation of this melancholic reflection in the game:

> Of all the things I've read and considered as a part of this work, perhaps the one that sticks with me most is (from Wikipedia) "Mono no aware" (物の哀れ), literally "the pathos of things", and also translated as "an empathy toward things", or "a sensitivity to ephemera", [which] is a Japanese term for the awareness of impermanence (無常 mujō), or transience of things, and both a transient gentle sadness (or wistfulness) at their passing as well as a longer, deeper gentle sadness about this state being the reality of life." Hopefully this game conveys some small aspect of that lingering awareness, that sense of empathy, that awareness and gentleness of form (para 22).

Both the Wabi-Sabi aesthetic and the larger, deeper aesthetics of Mono no aware have deep roots in the Japanese traditions of self-reflection and cultural wistfulness ("Japanese Aesthetics," n.d.). The juxtaposition of action within an environment that is not only tranquil, but specifically slower and more serene than would be typically presented in a similar game, is both deliberate and was tested repeatedly with target audiences to ensure that it was noticeable. In this sense, the design of the game is specifically attempting to engage players in noticing the theme of balance between disparate elements. It also encourages reflection on how a multitude of elements can at one time be either positive or negative in context, and thus can ultimately create experiences that are in many ways both.

SITUATING FRAGILE EQUILIBRIUM IN A LARGER REPRESENTATIONAL CONTEXT

The representation of mental illness in video games has been the topic

of an increasing number of academic works (Rivers, 2018) and industry discussion (Sinclair, 2019). Despite these efforts, more work in the field needs to be done. For our purposes, there is some framework on which to build. In their study of the most financially successful games from 2011 to 2013, Shapiro and Rotter (2016) found that 24% of financially successful games contained depictions of mental illness, and about 69% of the characters in these games that were identified as having mental illness also were violent. They directly contrast these representations with research studies that indicate the, "general prevalence of violence among mentally ill persons is low and associated with other factors such as co-occurring substance use disorders" (Shapiro & Rotter, 2016, p. 1594). Shapiro and Rotter (2016) conclude that content linking violence and danger to persons with mental illnesses furthers stigmas, calling for a greater production of video games that, "build empathy and understanding of sufferers of mental illness" (p. 1595). We might also conclude from this that, in general, the depiction of mental illness in games is unrealistic. As noted earlier, such depictions often rely more on tropes and stereotypes than any form of realism or nuance. Thus, the call for a more realistic, empathetic, and informative representations of mental illness in games and interactive media is important.

This discussion of *Fragile Equilibrium* aims to position *Fragile Equilibrium* as one of these new types of games that employ and advocate for positive engagement with topics of mental illness. We theorize that *Fragile Equilibrium* and games similar to it exist within a representational spectrum that can be thought of along two intersecting axes, as Figure 3 shows. The horizonal (x-axis) ranges from wholly literal to abstractly metaphorical in their depictions of mental health. The vertical (y-axis) examines the representation of character and self, ranging from ephemeral and abstract representations to realistic and customizable avatars. These concepts aid in analyzing the intent and effects of these video games as well as illustrating the many design choices game developers might consider when engaging with the topic of mental health. To illustrate, in this section, we analyze a set of games and where they fall along these axes.
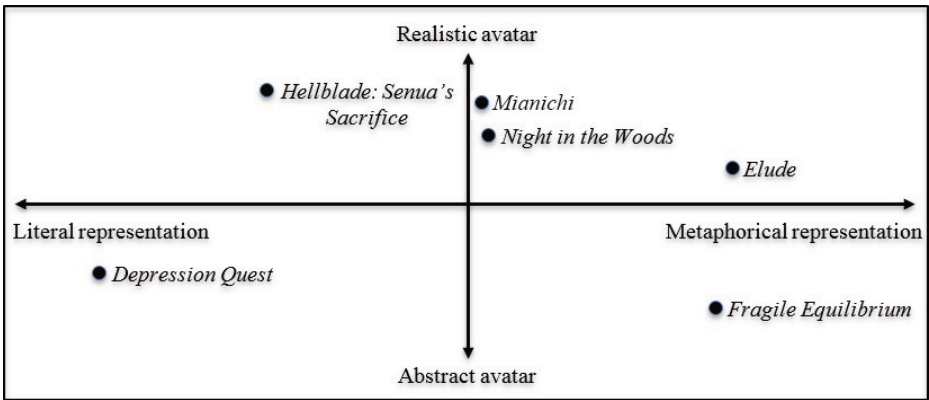
Figure 3: A two-axes plot analysis of design elements of recent games with sophisticated depictions of mental illness, examining a range of games from the literal to metaphorical, and from realistic to abstract avatar representation.

Depression Quest

On the far-left end of our representational spectrum is a category for wholly literal games like *Depression Quest* (2013), developed by Zoë Quinn, Patrick Lindsey, and Issac Schankler. *Depression Quest* is a text-based game originally published online as a browser game. Quinn later submitted it to Steam Greenlight, a resource for independent video game developers to get their projects accepted and distributed through the Steam platform. After receiving harassment, she removed it from the platform and later resubmitted it (Hoffman, 2017). Unfortunately, as previously noted, Quinn later received even more harassment for her game from the online GamerGate movement (Parkin, 2014).

Depression Quest has an intentionally simple and accessible design. It opens with a message from the designers stating that their goals for the game are, "[t]o help people without depression understand what the experience is like and to let people who do suffer from depression know that they are not alone" (Hoffman, 2017). As they play the game, players read very brief short stories from the protagonist's life and select from a list of choices on how to respond to each scenario. Usually, some options are crossed out, enabling the player to see them but preventing the player from choosing

them. These crossed out choices are often the healthier or most beneficial choices for the character to make. As Kyle Orland (2014) discussed in his response to the game, this is an emotionally powerful mechanic because "[i]t's not as if these common-sense moves and solutions to get out of your funk are hidden or unknowable. In *Depression Quest*, they are just *unavailable.*"

As the protagonist's mental state deteriorates from the choices the player has made for them and from the actions of the other characters, more options become crossed out. Orland (2014) points out that "[e]ventually, the lack of choice becomes so crippling that you're trapped among choices that will only drag you down further, embedding a powerful statement on the spiral of depression in a simple game mechanic." Players ultimately reach one of the game's five endings, which cover a range of states of the protagonist and the protagonist's depression. The important takeaway is that none of these are "tidy ending[s]" because living with and managing depression and other mental illnesses is not a straightforward process where one can find a "cure for depression" (Hoffman, 2017).

We have placed *Depression Quest* at the literal end of our representational spectrum (left-hand side) due to its direct and purposeful engagement with the topic of depression. The game's telling of the narrative in the second person perspective, and therefore direct addresses, puts the player in a position to more readily identify with the protagonist (Hoffman, 2017). Zoë Quinn and her fellow designers explicitly state the goals of this game are to promote engagement with depression. *Depression Quest* is one of the most literal representations to be found in the medium. That said, it is interesting that the visual representation of the game is mostly text-based. It has been packaged on Steam and similar platforms with a few live-video clips of individuals seemingly suffering from depression, but the game itself is played by clicking on hyperlinks in a text-based environment. In one sense, this allows the player to more easily envision the protagonist in any way they choose, but it also can be seen to reduce the direct one-to-one nature of the body-as-self in relation to the player-as-avatar within the game world, i.e., that their actions are physical as well as cerebral. As the player is not directly represented, we have plotted the avatar as

abstract, since their ultimate representation is purely a matter of player interpretation.

Hellblade: Senua's Sacrifice

Hellblade: Senua's Sacrifice (Ninja Theory, 2017) is another game that attempts to represent a more nuanced depiction of mental illness. The game, developed by Ninja Theory, places the player in control of a Pict warrior named Senua who must travel to Hel to rescue the soul of her murdered lover. During her journey, Senua suffers from various symptoms of psychosis that impact how her character, and the player, proceed through the world and narrative (Lloyd, 2018). The game itself, and its story, are a metaphor for her mental illness (Gordon, 2019). According to the National Institute of Mental Health (n.d.b, para 1), the term psychosis "is used to describe conditions that affect the mind, where there has been some loss of contact with reality." Symptoms of psychosis can include delusions, auditory or visual hallucinations, "incoherent or nonsensical speech, and behavior that is inappropriate for the situation" (National Institute of Mental Health, n.d.b). Senua regularly experiences hallucinations during the game, often seeing symbols that help her solve puzzles or hearing non-existent characters that give her advice.

Although *Senua's Sacrifice* is not attempting to portray depression and anxiety, like the other games included in this section, we include it as an example because it both portrays mental illness more generally and it is one of relatively few large-budget AAA games to have done so in a way that is not reliant on tropes and stereotypes. The scale of development and scope of the game is a further contrast to other, smaller efforts. Yet, it still deals with many of the same design decisions around interpretations and avatar presentation that are relevant to this analysis.

Senua's Sacrifice is one of the most widely and critically acclaimed games included in this analysis. It won the G4C + Polygon Choice award at the 2018 Games for Change festival and has received strong, positive feedback on its depictions of psychosis. Much of this has been attributed to the developers' decision to work with mental health professionals, in addition to persons who experience psychosis, to design a game that destigmatizes

mental illness (Gordon, 2019; Lloyd, 2018). Some criticism of the game's depiction of mental illness has been focused on the lack of social context in which Senua's psychosis is framed and how her character seemed to be only defined by her mental illness and past traumas (Greer, 2018; Lacina, 2017).

We have placed *Hellblade* a little bit farther to the right from *Depression Quest* on the representational axis, but still closer to the literal representation end than the metaphorical end as Figure 3 shows. This is because the game, like *Depression Quest*, approaches mental illness directly and explicitly through its depictions of Senua's psychosis and its creators' engagement with the mental health community. Beyond just depicting psychosis, *Hellblade*'s gameplay and narrative function as thinly veiled allegories for psychosis beyond the depictions of the main character. Due to these allegorical elements, *Hellblade* can be viewed as slightly more metaphorical than the direct and focused narrative interactions of *Depression Quest*. With regards to the avatar (vertical axis), the game more directly links the representation of Senua's psychosis to the physical, as the human avatar of the main character physically reacts to these elements with sight, sound, and touch within the game in ways that ask the player to reflect on these touchpoints between mind and body. Thus, given its use of a more realistic avatar, we place this game in the upper quadrant.

Night in the Woods

Another recent game with a sophisticated representation of mental illness is *Night in the Woods* (2017). *Night in the Woods* is a platformer adventure game that follows an anthropomorphized cat named Mae. After dropping out of college, Mae returns to her hometown of Possum Springs, a former mining town that is slowly sliding into greater and greater economic decay. Mae attempts to resume her small-town life and restarts her friendships with some of the other anthropomorphized animals of Possum Springs. While doing this, she also works to figure out a local mystery and battles recurring nightmares. Mae and her friends each struggle with their own mental illnesses throughout the course of the game. She, for example, deals with issues surrounding depression and anxiety, even having experienced depersonalization in the past. Eventually, through growing

their friendships, Mae and her friends develop compassion for each other and validate their experiences with mental illness (Spencer, 2017).

Night in the Woods was received positively with commendations focused on its frank engagement with mental health issues, as well as its well-rounded characters (McElroy, 2017; Spencer, 2017). The latter point was touched on repeatedly with one reviewer noting that characters are not solely defined by their past traumas and mental illnesses any more than a "real person" would be (Ashley, 2018). Another reviewer discussed how the designers "wanted to make a game about people who experience mental health issues, not the issues themselves" (Spencer, 2017). The general consensus amongst reviewers has been that these fully fleshed out characters promote players' engagement with the characters' mental health issues by making the characters believable and understandable.

Night in the Woods can be placed in the middle of the representational spectrum in Figure 3. The game openly and intelligently depicts and engages with issues pertaining to mental health and does so in a much less direct way compared to the previous two games we have discussed. As Phelps and Consalvo (2019) argued, *Night in the Woods* "never explicitly foregrounds itself as a game about mental illness or depression" (p. 5). Rather, the mental health of Mae and her peers is largely left open to player interpretation. Phelps and Consalvo (2019) further argue that the rural, impoverished setting of *Night in the Woods* not only impacts the mental situations of every character, but also communicates to the player themes of apathy and despair. The game employs literal, but not necessarily explicitly stated, depictions of mental illness while also containing metaphors of mental illness through its environment and narrative.

It is also important to note that *Night in the Woods* engages in the topic of depression specifically through its core game mechanic—the loop of Mae's day. As Phelps and Consalvo (2019) note:

> Procedurally, the game's core loop is to take Mae through the day, from waking up in the attic of her parents' house, through talking with and hanging out with friends, exploring a bit of the town, and then returning home. Although Mae and a friend or parent will occasionally go to a different area or scene (such as a party, the mall, or an abandoned building) there are no secret areas to unlock, and the town does not get appreciably

> larger over time; the player as Mae does not gain access to more places or more abilities. Instead, the player's journey is repetition – day after day, the same places, and the same people. This can be comforting, frustrating, and boring, sometimes all at once. Yet that daily foray, engaged in over and over, serves at least two purposes if considered metaphorically. Mae's journeys through the town embody a form of self-care treatment for depression and anxiety with many parallels to [many layperson's descriptions of] current cognitive behavioral therapy techniques which often involve specific attempts at providing daily structure and reducing complexity and ambiguity by preplanning and compartmentalizing activity. Thus, not only is the repeated routine a statement on economic instability and lack of opportunity, the fact that this interaction is both comforting and frustrating is a poignant statement on depression itself and even the treatment thereof (p. 6).

This has several connotations from a design perspective: it uses repetition as a narrative mechanic to situate the player's engagement with a topic (Bogost, 2007) and it specifically thwarts the typical ways in which adventure games appeal to players who might be typically associated with the *explorer* in Bartle's (1996) player types. There is, ultimately, nowhere to go, as the town cannot be fixed and cannot be escaped. This deeply engages players in a monotonous existence.

From the viewpoint of avatar representation, while Mae is clearly not human, she behaves as such. The avatar of Mae engages the player in the human-like physicality of depression at every turn: players see her sigh, see her visibly frustrated, and empathize with her trudging up and down the same hill through the same neighborhood, day after day. Thus, we place *Night in the Woods* in the upper quadrant.

Mainichi

A game that operates in its use of the repetition mechanic somewhat similarly to *Night in the Woods*, and that actually precedes it in release date, is *Mainichi* by Mattie Brice (2012). *Mainichi* seeks to convey,

> some of the social struggles the developer faces daily as a mixed transgender woman by recreating the simple act of going to meet a friend for coffee. Once the player returns home, they wake again the next morning to do the same scenario, which subtly changes based on how they decide

> to get ready. It's a very short but very personal slice of life experience (Mainichi, n.d., para 2).

Indeed, the point of the game is to build within its players an empathetic resonance with the plight of the author, and the 'psychic toll' (Porpentine, 2012) that they endure by feeling different and alone. While the major focus of the game is not depression or anxiety, these themes are resonant to some players who empathize with the feelings of loneliness and apprehension inherent in the experience of the game.

Mainichi was well-received within the independent game development scene and was an official selection at IndieCade 2013, among several other shows and installations. From a representative standpoint, the game is very literal in terms of how player actions are performed, but it relies on players to interpret these experiences for themselves by representing its themes through a repeated slice-of-life tactic that draws the player towards reflection. Thus, we place it towards the middle of the x-axis of the design space as it is using repetition as a form of metaphor, but in more literal ways than some other games discussed. It is, however, one of the most personal games of all of the examples presented here. The game uses slightly more realistic avatars than *Night in the Woods*. The avatars in *Mainichi* are human, but they are presented in an 8-bit anime-styled cartoon version of human, which is typical of the tools used to construct the game. Thus, we place *Mainichi* in the upper quadrant.

Elude

Another game that lies within the metaphorical end of this framework is *Elude* (GAMBIT Singapore, 2010). *Elude* is a game that attempts to emotionally simulate aspects of depression. It is intended "to inform friends and relatives of people with depression about what their loved ones are going through" (Rusch, 2012, p. 1). The game begins with the player character walking through a forest which is meant to represent a neutral state of mind or mood. The player's goal is to climb up the trees to reach their canopy. While climbing the trees, players "resonate" with various "passions" that are symbolized by colorful birds. When players reach the

treetops, through elevating their mood and resonating with their passions, they are able to soar through the skies.

Once flying, the gameplay changes and players must maintain this happy state for the character by continuing to fly upward. At some point, the character's mood will fall and so will they, through the sky and back toward the lowest parts of the forest. The character is effectively dragged down by depression. Players must then resume climbing to find the character's "true passions" (Games for Change, 2010), a cycle that repeats itself. The actions of the avatar are metaphorical. The climbing, running, and flying mechanics are metaphors for experiences of depression and its contrasts—being pulled down and trying to climb out with all one's effort during a depressive episode, and feeling light and free when not having episode. The idea of *resonate* as an action has no specific real-world connotation—it is purely an analogy for recognition and reflection.

We have positioned *Elude* on the far right of the representation spectrum (metaphorical representation) since it deals with mental health entirely through metaphor. As designer Doris Rusch (2012), wrote, "[s]ince depression is an abstract concept, the design of 'Elude' relied heavily on the use of metaphors" (p. 1).

While the actions of the player are metaphorical for the feelings and experience of depression, the representation of the avatar the player uses in *Elude* is more realistic than abstract. The player avatar can be considered realistic in presenting a slightly stylized representation of a young boy, with certain liberties taken to present the character in a cartoon-like style as integrated with the hand-painted approach for the environmental art. Similarly, the character moves in a relatively realistic fashion with respect to the walk cycle and jumping action, although with obvious fictionalized elements for the flying sequences.

Fragile Equilibrium

In considering the metaphorical end of the representational continuum, we again examine *Fragile Equilibrium* in the context of our plot analysis. As discussed earlier, *Fragile Equilibrium* is a game about balance and the

difficulties surrounding the maintenance of that balance. This core element of the game is intended to function as a metaphor for living with depression (Phelps, 2018b). The designer, Andrew Phelps (2018b), discussed how depression changes the way someone "move[s] through life. It becomes a constraint." This is represented in the game by the enemies and their damage impeding the player's ship from moving in the play space. Just as the in-game damage consumes the game world, depression can feel like it is consuming a person's emotional and physical spaces. However, as noted earlier, Phelps (2018b) argues that there is sometimes another side to dealing with depression, writing that, "it is also a thing from which many artists draw their creativity, their spark, their empathy" (para 15). Seeking to understand oneself can be very empowering, similar to how, in the game, healing the world grants the player powers to fight off more enemies, and this plays to the overall notion of repair in the game, of putting the world back together and appreciating its beauty while recognizing its fragility. As noted earlier, players must constantly repair their playable area whilst fighting off incoming enemies, which is where the theme of balance arises. As Phelps (2018b) summarized,

> [*Fragile Equilibrium*] invites the player to understand what it is to feel squeezed between a need to focus on forward progress, on challenges, on obstacles, on goals, but also to focus inwards, to face 'the wrong way', to be constantly aware that they are looking not just at a virtual world, but at a purposefully re-rendered representation of one. It is a quest for a fragile equilibrium, and thus the name (para 16).

Much of this is present in the form of metaphor and is never explicitly presented to the player, and as such requires some reflection and interpretation on the player's part. Because of the more metaphorical method of representing the experience of managing life with depression, *Fragile Equilibrium* is much closer to the metaphorical end of the representational spectrum. Further, the game moves away from representing a player directly as an avatar, using instead the shmup tradition of presenting a ship as the playable character. There are no cut-scenes with the pilot, no dialogue from mission control, no element that attempts to humanize or personalize the craft in the game. Thus, we place the game in the lower right quadrant. In this sense, *Fragile Equilibrium* shifts

the focus on depression to the interpretation of and interaction with the environment as a more abstract approach.

Furthermore, the design of *Fragile Equilibrium* illustrates the way that experiential learning theory can directly inform game design with regard to mechanics and non-narrative elements. Each level of the game introduces a slightly new environmental twist. The first level slowly introduces the player to the shattering of the screen and the repair mechanic, first gently, and then in ways where the flow of the level begins to guide player towards patterns and strategies of moving back and forth between progression and repair activities. Thus, players are introduced to the core mechanic, and then practice it repeatedly in an experience loop. Level two introduces crystals that can be charged by shooting them with player weapons, which will then discharge this energy in huge bursts across the screen and clear many enemies at once. Enemies can use the crystals in the same way against the player, and thus this becomes another balance mechanic in keeping with the overall metaphor. It engages the player first in the exploration of the environment, (i.e., what is this thing that behaves differently from what they have already experienced), and then incorporates this concept through repetition until it becomes automated. Level three introduces lanterns that can be pushed by player weapons into enemies for incredible damage bonuses, but again enemies can do the same to the player, creating a push-dodge balance mechanic. Level four adds mines that can be triggered by player to damage enemies. But, if the mines are detonated with the player in range, the player is pinned to that spot for a certain length of time. This fits metaphorically in the representation of depression with certain events causing a kind of emotional paralysis and inability to move. It specifically causes a form of frustration where the core defensive ability of the player, dodging, is momentarily disabled. This comes full circle as these mines, should they pass by the player to the left of the screen, will shatter a huge chunk of the playable area. In this way the mines are more critical than the enemies themselves and serve to heighten anxiety and focus in a compound fashion. The game is ultimately about finding a balance to survive feeling squeezed and thwarted. Each level builds upon this theme in ways that are directly designed to reflect this core experience back at the player again and again.

Analysis of Representational Context

Now that we have an idea of what this mapping of the design space and the games within it looks like, we can move to exploring how depression and mental illness can function as a meaningful game mechanic. The usage of depression and mental illness as a game mechanic can also be thought of as existing on a very similar spectrum to that which we have just described. As a starting example, the protagonist's depression in *Depression Quest* serves as a rather literal mechanic in the game: as the depression and its symptoms become more severe, they physically prevent the player from making certain choices, while still knowing those choices are present. In *Night in the Woods*, Mae's depression and her friends' mental illnesses do not function so much as mechanics that literally impact gameplay like the previous examples, but they do impact her interactions with others, how she approaches activities and tasks in her life, and how the players see and interpret the game world as well as the mental state of the character. Elements of depression can be found in almost every aspect of *Fragile Equilibrium*. As described earlier, the fracturing and destruction of the screen is symbolic of the feeling of one's world breaking apart. The maintaining of balance between repairing and fighting off attacks is a metaphor for having to strike that balance in one's life while constantly feeling squeezed or under pressure. While these mechanics affect and alter the gameplay experience, they are not literally the symptoms of depression. They work as metaphors for these symptoms. *Elude*'s depression also works in metaphor. The mechanics that help and hinder the character are not actual passions and depression, but rather creative metaphors for them.

Similarly, the portrayal of the player in the games from the viewpoint of avatar raises many interesting design considerations. The issues surrounding the identification and personification of players and their avatars are extremely complex (Rehak, 2013; Waggoner, 2009), and well beyond the scope of the limited analysis presented here. Nonetheless, it is interesting to note that the ideas of literal and abstract form here a second distinct axis rather than a simple translation. *Elude*, for example, offers a realistic avatar, but uses a metaphorical representation of action and approach to depicting mental illness. It invites the player to consider the

humanity of its subject directly through personification with the player's avatar. *Night in the Woods* seeks to downplay certain elements of realism regarding avatar depiction through anthropomorphizing the characters, but quite literally approaches the topics of depression and economic despair. *Fragile Equilibrium*, on the other hand, includes a highly abstract avatar and a metaphorical representation, offering no direct representation of the player whatsoever (other than the ship the player controls).

In considering this framework, the overall point is consideration of the breadth of the design space and the potentiality for multiple competing approaches for representing mental illness in games. This is not to say that games plotted in one quadrant are more effective than those plotted in other quadrants, or that a given representative type is preferable. Rather, it is to contextualize the point that games are in their infancy both as a medium in general and particularly when it comes to nuanced representations of the complexity of the human condition. It argues that we should not allow either a stereotypical view of gamer culture, a commercial-centric focus on more literal forms of representation, or a static understanding of "what certain game forms are capable of" limit the ingenuity and innovation of designers seeking new forms of expression, a point which is strongly echoed by the author of *Mainichi* in their own post-mortem (Brice, 2014). It argues for artistic consideration of the entire design space and challenges the notion that learning or empathy can only occur in more literal simulations or with more relatable human-based avatars. In this way, it is a tool for designers to consider their own ideas and prototypes in a broader context.

Repetition as a Common Form

Given the breadth of the design space as just articulated and the need for creative diversity, it is worth noting that there is one common interaction mechanism in all of the games presented as examples here. Beyond a shared focus on a more realistic portrayal of mental illness in games, all of these games incorporate repetition as a core mechanic in their approach to player interaction. We argue that this form of repetition can further promote player engagement with themes and content within the

respective game as noted in the section on experiential learning. There are aspects of each of these games that cause semi-unconscious thought and reflection in players. When playing *Fragile Equilibrium*, for example, players must manage different pieces of gameplay in order to succeed. They must balance repairing the shattered screen, fighting off enemies from hitting the left side of the screen, and allowing some enemies to hit the left side of the screen so they may repair it and draw energy for their special powers, all while endeavoring to progress forward in the level. This occurs in a semi-unconscious state. After these mechanics are understood and practiced, they are quickly automated to a kind of background process while the player actively considers overall strategy, plans for the next wave, and seeks to balance offense and defense. They are aware of their need to maintain this balance, yet it also becomes so natural to them to the point where they don't have to always think about it. Players become suspended in this state of conscious/unconscious limbo and continually repeat these balancing actions while preserving this mental state.

Ian Bogost (2007) discussed how repetition of actions or rules in video games can function to inform us about something rather than it being told to us. Phelps and Consalvo (2019) argued that "repetitive acts in gameplay can function procedurally as metaphors themselves" (p. 2). The repeated, semi-unconscious balancing act of *Fragile Equilibrium* has the possibility of encouraging player reflection on the actions themselves and what they might symbolize. Earlier in this article, repetition was linked to a form of practice and sustained engagement, first in learning a new concept and then practicing that concept in the experience loop phase, and this was itself repeated in each level of the game in slightly different ways. Indeed, we theorize that this commonality of repetition as a mechanic in the representation of these disorders is likely because these disorders themselves have as a common element of their definition that they occur over time (i.e., that they are experienced over a significant period of time in order to be considered a diagnosis). Thus, almost by definition, this repetition-as-interaction modality is likely to recall and model real-world engagement. In this fashion, repetition can be its own form of didacticism, and used effectively as a design element in the portrayal of depression and anxiety.

CRITICAL RECEPTION AND PLAYER RESPONSE

Thus far we have carefully reviewed the relevant design theory, the design process, and the release of the game and associated materials. We have also compared and contrasted *Fragile Equilibrium* in context to other games, ranging from literal to metaphorical representations and realistic to abstract avatars. Our analysis of the design draws not only from a close reading of the game, but also Phelps' (2018b) statements about the game and the processes he followed. But how effective can abstract, metaphorical games be as tools to engender reflection and response in other players? For players that are not presented with additional materials, how well do they convey the themes inherent in their design?

In order to best study and gauge player engagement with *Fragile Equilibrium*'s themes, metaphors, and emotions, this section explores the user generated reviews and comments made on the various platforms on which the game is available. As noted previously, *Fragile Equilibrium* was released on Steam, XBOX One, the Microsoft Store, and the website itch.io. Users have commented and responded to the game on all of its release platforms except for the Microsoft Store. Overall, players have provided positive reviews of the game. Much of the praise has centered around the aesthetics of the game with multiple users complementing the beauty of the art and music, as well as how the two contrast with the action-oriented nature of the game (e.g., OuttaSite, 2019; pikappp, 2019; Verytex, 2019; ZerothShell, 2019). Multiple commenters also stated that the game was a unique and refreshing entry into the shmup genre (The Hooloovoo, 2019; Verytex, 2019).

While none of the reviewers of *Fragile Equilibrium* specifically commented on its metaphorical narrative of depression and anxiety, their responses still provided insight as to their levels of engagement with the basic concepts. One player commented on how they felt the need to balance the various aspects of gameplay (ZerothShell, 2019). Based upon a rough translation, it does appear that this player interpreted themes of despair or hopelessness, writing, "you can't avoid the fate that [the game world] will eventually be destroyed" and "[i]t's not clear if you can save the world" (ZerothShell, 2019).

Additionally, there were two individuals that had video responses to *Fragile Equilibrium*. One YouTuber, OuttaSite (2019), included the game in a video reviewing new and interesting indie games. Most of his comments on *Fragile Equilibrium* revolve around the art, music, and mechanics of the game, but there is one moment where he says that these elements work well with the game's "mildly philosophical message" (OuttaSite, 2019). He does not provide any additional detail outside this comment. As such, it is difficult to discern how much of the core message of the game may have been understood. However, his statement does show that he has understood that *Fragile Equilibrium* is intending to communicate something to its players, and perhaps a bit about how the designed elements of the game all work towards this goal.

The other individual, YouTuber Mr Skysen Games (2019a, b, c, d), posted a series of four "Let's Play" videos on *Fragile Equilibrium*. In these videos, Mr Skysen narrated his gameplay while also reflecting on the various aspects of the game. Like many of the other reviewers, he complimented *Fragile Equilibrium*'s art, music, and unique game mechanics. However, he also exhibited a deeper understanding of *Fragile Equilibrium*'s themes and indeed got very close to speaking about the core metaphor. In fact, he discussed mental health and alluded to the game as a metaphor for depression but stopped short of actually saying it outright. In one specific sequence he said, "what is this? Manifestation of all the bad feels going on? Cuz often times things like depression and whatnot are shown to be like goop like that, just sticky, icky bad feelings and all that. Bogs you down…" (Mr Skysen, 2019a). It would appear that he understood his gameplay experience as metaphorically depicting symptoms of depression despite not specifically calling out the metaphor. After losing one of his playthroughs of *Fragile Equilibrium*, Mr Skysen commented, "loss isn't always a bad thing. You can learn from it" (2019c). This comment would seem to have a double meaning to it. He was learning from his loss in the game but was also making a deeper statement about coping with setbacks in one's life, possibly alluding to the game's message. Another poignant statement came from his second video when he said, "…it's not just recreating everything, you're just pulling it all back into place. You're not creating a new reality; you're just fixing it. You're trying to hold everything all together as best you can in this crazy world…" (Mr Skysen,

2019c). Much like his other comments, this serves as a good example of Mr Skysen's engagement with the emotional response *Fragile Equilibrium* intends to provoke in its players.

Mr Skysen also repeatedly commented on the game's primary concept of balance. He even connected it to how people attempt to manage parts of their lives, further exemplifying his engagement with *Fragile Equilibrium*'s metaphorical nature. As one example, he connected the gameplay strategy of leaving parts of the screen shattered to managing one's life, saying, "...not every peril in life needs to be taken head-on and you don't always have to deal with everything..." (Mr Skysen, 2019c). Overall, Mr Skysen showed very clear engagement with *Fragile Equilibrium*'s role as a metaphor for depression. His own anxiety at parts of the gameplay, in particular the fourth level, are clear in direct observation. Thus, it is clear that a few users were able to connect with the thematic and emotional intentions of the game in an experiential fashion and in ways that are directly in line with the authorial intent of the designer. In this fashion, the game illustrates that such abstract depictions are capable of conveying the underlying emotion of depression and anxiety and begs the question of how other designs could extend this work further to even greater effect.

CONCLUSION

Mental health and mental illness representation in video games has recently been a topic of more significant discussion among academics, game designers, and players alike (Rivers, 2018; Sinclair, 2019). Generally, within popular media, mental illness is depicted in negative and stigmatizing ways, and games themselves are no exception. Such portrayals of mental illness vary from inexplicably violent characters to sanity meters that "measure" mental illness within the game in bizarre ways. In reaction to this, and other cultural elements, there has been a greater push to produce games with positive and destigmatizing portrayals of mental illness (Shapiro and Rotter, 2016; Sinclair, 2019). As we have shown, the games attempting these more nuanced and positive portrayals can be thought of as existing on a continuum of representation that range from literal to metaphorical, and that use avatars that range from realistic to abstract. Games closer to the literal end of the representation spectrum

usually have narratives and experiences that explicitly deal with mental health. Games that are closer to the metaphorical abstract end of the spectrum typically deal with mental illness indirectly through the use of metaphors.

As we have seen with *Fragile Equilibrium*, there are additional ways to engage with and depict anxiety and depression through experiential gameplay and metaphor, without the use of characters or narratives. By using mechanics, replication, and a careful attention to aesthetic conditions, *Fragile Equilibrium* constructs a metaphor for depression and anxiety without ever naming them outright. The evocation of the 1980s and the decaying ruins in the game work to further impress these feelings onto the player. These conditions work to create an element of melancholic reflection, which serves to foster eudaimonic gratification within the player, prompting players to turn inwards and evaluate the core tenets of the game. This is further evidenced by the gaming community's reception of the game. *Fragile Equilibrium* has largely positive reviews across multiple industry standard platforms and has inspired some reflection and debate amongst those who have played through the game. These factors work in concert to suggest that the multiple aspects of *Fragile Equilibrium* work to create a game which successfully communicates with its players and actively engages their observation and understanding. *Fragile Equilibrium* can thus serve as a successful model when attempting to implement these same principles in other games, and interactive experiences, which seek to create meaningful experiences via experiential metaphor and aesthetic design.

More broadly, in considering depictions of mental illness within games, and specifically depictions of depression and anxiety, designers should be encouraged to consider engaging with these themes in a broad and unrestricted way. While some members of the current gaming community may continue to struggle with what constitutes a real game experience, designers should be free to explore the myriad of ways that games can engage in complex and nuanced subjects regarding the human condition. It is only through experimentation and repeated design that games can continue to expand as a form of art and expression. More recent attempts to engage with issues of mental health through increasingly abstract and

experiential approaches are key to continue exploring how to better inform public understanding of these conditions and the emotional experiences they can have on affected individuals.

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