HANDLING DIFFERENCES IN SKILLS BETWEEN PARENTS AND CHILDREN PLAYING TRINE AND LITTLE BIG PLANET

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Introduction: Cooperative Game Design and Difference in Skill

There are several ways to classify the numerous games that can be played together. A major distinction can be made between competitive and collaborative games. In competitive games each player tries to win over the other player(s). In contrast, the goal of cooperative games is not to win as a player but as a team collaborating with other players. However, within the field of game studies it has become quite obvious that the way in which a game is designed affects the whole gaming experience (Björk & Holopainen, 2005), for individual players as well as groups of players, such as in cooperative games. Seif El-Nasr et al. (2010) developed a set of cooperative design patterns and concluded that both a split screen and the camera led by the first player caused the players to wait for each other and get in each other's way. They conjectured that these patterns could have a negative impact on the play experience. However, in this paper it is conjectured that different skill levels between players play an important role in how these cooperative game design patterns are experienced. For instance, Voida and Greenberg (2009) found that the level of expertise in groups playing together usually

varies and that 'gaming groups gave careful consideration to the selection of an appropriate gaming platform and suitable games for groups with ranges of expertise levels'. Taking differences in skills into account therefore gives a crucial refinement to the work on cooperative game design patterns and helps designers to better understand the kind of player interaction a certain cooperative game design facilitates.

This paper thus aims to explore the interaction patterns that emerge when players of different gaming skills play co-located cooperative games and how this relates to different design characteristics of the game.

Study Design

In order to get a deeper understanding of how the game design of cooperative games handles the differences in skills it was decided to focus on parents and children playing together. Parents and older children are likely to have different gaming skills as well as "life skills", which makes them especially suitable for this study.

Two cooperative games were chosen that have several features in common, but also possess some quite distinct (cooperative) features as well as difficulty levels. These games were *Little Big Planet* (*LBP*) (Media Molecule, 2008) and *Trine* (Frozenbyte, 2009) on the PlayStation 3 (PS3).

Videotaped play sessions of four parent-child pairs playing these games were analyzed. The analytical approach was Interaction Analysis (IA) of video (Jordan & Henderson, 1995). Several studies have used similar approaches in order to study *how* gamers manage particular gameplay activities (e.g Mondada (2013), Sjöblom (2008) and Reeves et al. (2009)). These studies are often explorative in nature, sometimes even based on a single case. While not relying on a single case, this study involves a limited number of cases and is explorative in nature. The main goal is to see what interaction patterns can emerge when parents

and children with different skills are playing together, and how these patterns can be attributed to game design characteristics.

Data Collection and Analysis

While the pairs were playing, the screen was captured and the pairs were filmed with a webcam. Pairs were urged to play each game for around half an hour to an hour, resulting in approximately 6 hours of videotape. Transcripts were initially created in the players' native language using simplified transcription conventions similar to Aarsand (2007). Informal discussions with/between the participants about the differences between the games that occurred after the play sessions were noted by the researcher. For the reader's convenience, the transcripts have been translated into readable English (not verbatim).

The film material was analyzed by looking for episodes in which the players were presented with typical challenges in the game. We then determined whether there was an observable difference in skill between the players, how this affected the interaction between the players at that moment, and how the game design features facilitated or hindered them in overcoming the challenge together. Thereafter, the typical interaction patterns for the game play in each game were described.

After the gaming sessions all participants were asked to give written answers to the following questions for each of the games: What was the most fun with this game, What was the least fun with this game, How did it feel to play this game with the person you played with? The answers to these questions were used to determine whether the interaction patterns that emerged from the video data matched the players' experiences.

The Parent-Child Pairs

Table 1 shows the characteristics of the parent-child pairs.

Parent	Child	Previous experience
Paul (38)	Ester (11)	Ester has played some PS3 games before on a friend's PS3; Paul has no experience with PS3, but they own a Wii and play games with it together.
Ingrid (41)	Sam (13)	Sam owns a PS3 and plays football games on it with his brother. Ingrid had occasionally participated in these games but isn't an avid gamer.
Lizzy (43)	Susan (11)	They own a Wii on which they play sports games together, but they have never played on a PlayStation.
Ron (44)	Jasper (8)	They own a Wii on which they play sports games as well as some cooperative games such as *LEGO Star Wars* (TT Games, 2007). They have never played on a PlayStation.

Table 1. Characteristics of the parent-child pairs.

Little Big Planet

In *LBP* each player controls a ragdoll. All ragdolls have the same abilities. Together the players have to jump and avoid obstacles to successfully navigate to the end of a level to win. The players can collect points and costumes for their characters on their way, and there are shared puzzles and objects that the players can interact with at the same time. The camera is led by the first player and a player that lags behind only has a short time to catch up before he/she disappears from the game and has to be revived. A character that has disappeared/been killed reappears once one of the other characters has reached a spawn portal (see Figure 1). Characters can only reappear from each spawn portal a limited number of times. If all characters disappear and cannot spawn because the last spawn portal has been used too many times, the level is lost and must be played over.

Figure 1. The ragdoll with the blue hair has just reached a spawn portal (highlighted circle) in Little Big Planet

Trine

In *Trine* there are three main characters (a thief, a wizard, and a knight) that need to jump and avoid obstacles and enemies to successfully navigate to the end of a level to win (see Figure 2). Each player controls one character and can switch to another character that has not been taken by another player. The three characters are complementary, meaning that they have different abilities. There are shared puzzles and goals and limited resources. The camera follows one player (but not necessarily the first) and other players disappear from sight if they do not stay close to each other. Each character can be killed when it receives enough damage (e.g. by being hit by an enemy or falling in a spiked pit, not by friendly fire) and will spawn at the next portal if another player reaches it. Since this means that a killed character with its special abilities is no longer available to the remaining player(s) until the spawn point is reached, this may lead to a situation where players are very dependent upon each other. When playing with two players, a player whose character

has been killed can take the character that has not yet been taken to continue playing.
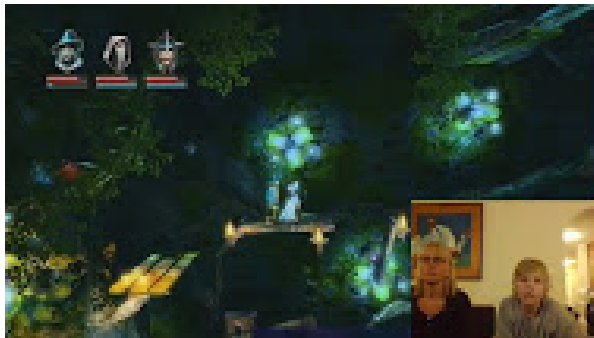
Figure 2. The wizard and the thief have reached the same platform in Trine

Results

In this section the typical interaction patterns for each of the games are described and illustrated with excerpts. After the presentation of the typical interaction patterns the game design patterns that seem to cause their emergence are described and the players' experience of the game play is discussed.

Little Big Planet

Three characterizing interaction patterns emerge in *LBP*: Teasing, Laughing at failure, and Teaching.

Teasing

Teasing is a common interaction pattern in *LBP* when one of the players is behaving less skillfully. In the excerpt below, Ester and Paul need to jump some blocks to progress. Ester is struggling to get up on the blocks while Paul jumps up rather easily. Ester keeps struggling with the block and stays behind.

01 34:19 Ester: now the pro will (3) let the pro take care of this ok? Haaa ((she drags too far, but Paul is able to hop up anyway))

02 34:24 Ester: no hm

03 34:34 Ester: [I can't get up ((she is unable to place the block at the right position))

04 34:34 Paul: [will the pro come soon or what? ((he has been waiting for E))

05 34:38 Ester: I am actually a pro at dragging ((she explains that she is good at dragging, not at everything else))

06 34:39 Paul: should I drag? ((he misunderstands Ester's comment and thinks she wants him to drag the horse))

07 34:40 Ester: no, I am a pro at dragging ((she explains again that she is only a professional at dragging)

08 34:52 Ester: uuuhhh ((tries to jump up))

09 35:00 Ester: one just glides on this thing (1) bad material thus ((she tries to drag the block, but the block rolls over instead))

10 35:07 Ester: but uhuh ((unable to hop up, laughs))

11 35:15 Ester: oh I'm being crushed o o ((the block is crushing her))

12 35:22 Paul: shall I ride without you or are you coming? ((he has been waiting with the horse at the top))

13 35:24 Ester: I will just hop onto this here howoowooo! ((both laugh))

14 35:33 Ester: finally! There comes the pro again ((grins))

Even though Ester is lagging behind, this does not cause any

troubles for Paul; he does not necessarily have to wait for Ester and could decide to go on alone. However, he chooses to wait for her, and instead he teasingly reminds her that she said that she was a pro on line 04 and Ester takes up on that again on line 13 when she grins and says: 'Here comes the pro again.' This excerpt also shows the point that both players can act more or less skillfully at different times within a single game; usually Ester acts more skillfully (making her the 'pro' at dragging), but in this case it is Paul.

Laughing at failure

Another typical interaction pattern occurs when one of the players fails but both players laugh at the situation. In the next excerpt Sam and his mother Ingrid are playing. Sam has extensive experience of *LBP* and helps his mother by explaining the game and staying close to her. There are many situations in which Ingrid is less skilled in overcoming the challenges, like jumping and running. In the following example Ingrid has been able to jump over some obstacles but there are still two left before she reaches safety. Sam urges her not to fail.

01 17:35 Ingrid: watch out for me now

02 17:36 Sam: jaha

03 17:39 Sam: yes! ((she has jumped to the next object)) Oh, so please don't fall now!

04 17:44 Ingrid: wheee, no! ((Ingrid falls, both lean back, hands to their heads and laugh, see Figure 3))

We can clearly see that there is no real frustration on Sam's part about his mother's failure. Both laugh and since Sam already had reached the next portal, Ingrid's character is transported there and they can continue playing.

Figure 3 Ingrid and Sam both hold their heads and laugh when Ingrid has died the last time

Teaching

Often the most skilled player shows teaching behavior towards the less skillful player. In the excerpt below, Sam tries to show to his mother how she should jump up on a wheel by going back and performing the jump again.

01 25:10 Ingrid: there! you release it so when it is at [sort of four o' clock?

02 25:12 Sam: [ah I

03 25:13 Sam: ah I'll show you again

04 25:15 Sam: [ah

05 25:15 Ingrid: [ah you show me yes

06 25:16 Sam: watch here

07 25:17 Sam: when it is down there ((points at the screen))

08 25:22 Sam: so, go now

Players' experience of the gameplay

An important theme in *LBP* that emerges from the questionnaire is the sense of togetherness. Ingrid for example writes: "the most fun [with LBP] was the collaboration with Sam, that he was having so much fun on my behalf…that he opened up to me." And Susan writes about the collaboration with her mother: "It was really fun, exciting and cozy". Some adult participants commented that *LBP* was "a bit monotonous" (Ingrid) or "not very spectacular" (Ron), but it seemed that the positive playing atmosphere between the players compensated for that.

Characterization of LBP

LBP can be characterized as a game in which the player that acts most skillfully is able to create progress in the game for both players. Therefore, players can tease, laugh at failures and in some cases even show teaching behavior when confronted with a difference in skill. There are several game mechanics in *LBP* that make this compensation for one player's lack of skill possible. First of all, a failing player is transported to the furthest portal one of the players has reached and the **portals are quite close to each other**. Therefore it is likely that the remaining player reaches it even if the other player's character has been killed. Furthermore, the loss of a character does not usually lead to a loss of some necessary abilities because in terms of gameplay all characters are similar, i.e., unlike in *Trine* (see next section) the avatars do **not** have **functional roles** in relation to the challenges in the game. Therefore the game does not become much harder when one of the characters has 'died.' Finally, the **camera** always **follows the leading player**, making it easy for the most skillfully acting player to proceed even when the other player is lagging behind. It is interesting to notice that this contrasts with Seif El-Nasr et. al's (2010) finding that the camera being led by the first player may lead to waiting for each other affecting the gaming experience negatively. In LBP the players sometimes choose to

manage the camera and thus wait for each other, as in the following excerpt where Ester is lagging behind and has troubles seeing how to jump.

01 25:10 Ester: I still don't know how one can come there (.) hm (.) hm

02 25:12 Ester: hm hm ((tries to jump up a wall but has troubles doing so))

03 25:16 Paul: do I have to help you so you can [see something?

04 25:18 Ester: [o please

05 25:19 Paul: see something

However, this does not cause frustration because the players can make the choice to wait or just retrieve the other player at the next portal.

Trine

The characterizing interaction patterns that emerge in *Trine* are Frustration over partner's failure and Frustration of own failure.

Frustration over partner's failure

In contrast to *LBP* failures from the least skillfully playing player in *Trine* often lead to frustration on the side of the more skillfully playing player. Below, two examples are given to illustrate this. In the first example, Ingrid plays the wizard and Sam the thief. Sam is going ahead while Ingrid is trying to draw a box. Ingrid often has troubles using the controller to carry out tasks.

01 31:01 Ingrid: I should maybe create a little box like you did so you can stop that thing ((tries to draw a box))

02 31:08 Sam: you draw a circle, mama!

03 31:10 Ingrid: it went well when you did that

04 31:11 Sam: because I am good

05 31:18 Ingrid: ah

06 31:19 Sam: I don't see anything ((he is on platform higher up which leads him to being out of view))

07 31:20 Ingrid: it worked

08 31:21 Sam: I don't see anything ((a bit more urgent))

09 31:23 Ingrid: a, so you see nothing

10 31:29 Sam: I know how to get over ((tries to jump but is killed and spawned back to his mother's location))

11 31:32 Sam: no, I knew it when I come over (.) you should die

12 31:34 Ingrid: why that?

13 31:35 Sam: you should die ((shoots arrows at his mother's character without any effect))

14 31:36 Ingrid: but what are you doing? You are not supposed to hit me

15 31:40 Sam: I managed to do it but I died because I was too far away

From this excerpt it is clear that Sam's going ahead leads to a problem for him since the camera stays with Ingrid's wizard. Sam is therefore unable to see what he is doing. While he performs skillfully, he is held back by his mother's unskilled performance. Playing the game alone would probably be easier for him, and he thus tries to shoot the wizard, saying 'you should die' in lines 11 and 13. Although it is a little bit playful, he says this without smiling.

The second example is from Jasper and Ron. Jasper is often annoyed with his father when playing *Trine* because he experiences that his father Ron is hindering him. In the following excerpt, Ron is the thief and is (therefore) going slightly faster than Jasper, who is the knight. Jasper is blaming his father for killing them both by going too fast.

01 03:41 Jasper: dad, you are way too fast, I can, I can't do this you know

02 03:44 Ron: I I don't know where I am

03 03:47 Jasper**:** yeah, now I am already dead ((the knight is killed))

04 3:50 Jasper: now we can't do the fighting anymore

05 3:55 Jasper: dad, you have killed the fighter

06 4:02 Ron: I will also be dead soon, I know, I don't know what to do

07 4:18 Ron: I am also dead

08 4:22 Jasper: good idea to, to kill me

09 4:29 Ron: so ((the last of their characters is also killed))

10 4:30 Jasper: is that what you wanted? ((they have to return to the last portal))

A final example comes from Ester and Paul. Ester is playing the wizard and Paul the knight. Ester has just succeeded in hopping to the other side of a spiked pit and her father is about to follow. He dies and Ester has to go on alone.

01 9:38 Ester: oeeh that was lucky

02 9:40 Paul: whow ((P tries to jump but falls down instead))

03 9:47 Paul: ouch ((jumps on pins))

04 9:50 Ester: daddy you can't hop several times

05 9:52 Paul: ((laughs))

06 9:52 Ester: daddy every time you hop you land at the same place so you should not hop ((P's character has died))

07 9:53 Paul: ((laughs))

08 9:58 Paul: that was stupid

09 10:00 Ester: whoaw, my god daddy, why now? ((she is now alone as the wizard))

10 10:02 Ester: and so I can [xxx

11 10:03 Paul: [watch out now ((a skeleton shoots an arrow at the wizard))

12 10:03 Ester: whhaow

13 10:04 Ester: what did I take on me daddy?

14 10:05 Paul: just run now

15 10:06 Paul: you are running in the wrong direction

16 10:07 Ester: yes but say so then!

17 10:10 Ester: this is agonizing [you know?

18 10:11 Paul: [run fast now

19 10:11 Ester: oaaah

20 10:12 Paul: fast ((laughs))

21 10:13 Ester: I do run fast, well you know how fast I run aha my god

22 10:17 Paul: fast eh

23 10:18 Ester: why do you have to die right now?

It is clear that Ester finds the situation quite stressful. At first she is a bit annoyed by her father's hopping which kills his character (lines 4 and 6). Thereafter she complains about her father having to "die just now" in lines 9 and 23. She now has to proceed on her own until she reaches the next portal, and while her father is giving her verbal advice he cannot do anything to help her. Although Ester is currently the most skillful player, she feels the responsibility to keep them both going (which she explicitly expresses in line 13 saying "what did I take on me daddy?") and this is not easy without the help of her father's character.

Frustration over own failure

While the most skillfully playing player can be frustrated over failures by the other player, the least skillfully player can also become frustrated over his/her own failure in relation to the (either expressed or sensed) frustration of the other. In the following excerpt, Paul and Ester have just opened a wall with a heavy fist and enter a new area. Ester is the knight and Paul is the thief, and they are getting attacked by skeletons. Ester has trouble using the right buttons on the controller to use her character to fight.

01 4:14 Ester: ooh

02 4:16 Paul: [aah behind you!

03 4:16 Ester: [xxx run

04 4:17 Ester: behind you

05 4:19 Paul: take it you can hit

06 4:21 Ester: well well I don't remember, OK hit

07 4:24 Ester: no wro:ng ((instead of hitting she changes character several times))

08 4:25 Paul: gggg ((makes a sound in his throat))

09 4:28 Paul: soooo yes

10 4:29 Ester: really huhu

It is likely that Ester sees her father's comment in line 05: 'take it, you can hit' in combination with his throaty sound in line 08 as a critique of her not so skilled performance when trying to kill the skeletons. Later on she clearly expresses that she thinks her father is angry with her because she is unable to perform skillfully (especially lines 19 and 21):

11 6:29 Ester: well I don't like this game ((they have slain all skeletons))

12 6:31 Paul: do you not like it?

13 6:32 Ester: weeeeah, take cover! ((skeletons are attacking them))

14 6:34 Paul: whoooow

15 6:35 Ester: ouch, why especially me? ((gets hit by an arrow of one of the skeletons))

16 6:37 Ester: [wva xxx

17 6:37 Paul: [how do you change? ((wants to change to another character))

18 6:39 Ester: so

19 6:40 Ester: I don't like it when you just get angry with me

20 6:43 Paul: I↑ never get angry

21 6:44 Ester: yo when you say that I miss all the time

22 6:46 Paul: ((laughs))

Players' experience of the Gameplay

In *Trine* the most important theme in the questionnaire seems to be that the game was hard and one got stuck, since this was mentioned by 5 out of 8 participants as the least fun. The way the collaboration between the players is implemented in *Trine*, having different characters that have different abilities, adds to the difficulty of the game. For example, Ron points out as the most fun: "[*Trine*] was also more challenging, the interdependence between the players was larger than in the other two games." When discussing the collaboration between him and Jasper he adds: "One thing was clear: Jasper had to have the fighting character. I also have to admit that since we both didn't know the game, Jasper understood the game sooner than I did and knew when to use which character. A result was that I got even more reprimands." Especially Ingrid, Lizzy and Ron clearly indicate that the collaboration with their children was more fun in *LBP* than in *Trine*.

Characterization of Trine

Trine leads to more signs of frustration from both players than *LBP*. The game design characteristic in *Trine*, contrary to *LBP*, is that the player that acts most skillfully is still unable to make the team progress in the game when the other player behaves less skillfully, and may even be hindered to behave skillfully.

There are several game mechanics in *Trine* that cause this. First of all, a player is transported to the last portal one of the players

has reached, but the **portals** are quite **far from each other** so that chances are that none of the players is able to reach the portal. Furthermore, the **functional roles** cause the loss of a character to lead to a loss of some necessary abilities, making it harder for the remaining player to reach the next portal (for example, losing the knight makes it almost impossible to fight enemies, as Jasper points out to his father). Finally, the **camera** does **not** always **follow the leading player**, making it harder for the most skillfully acting player to proceed when the other player is lagging behind. In order not to hinder each other, the players have to perform equally skillfully throughout the game. It is interesting to note that Lizzy and Susan, who both lack game playing experience, show less frustration when playing *Trine*, compared to the other pairs. This is likely to be related to the fact that there is no clear difference in game playing skills between them (yet).

Discussion and Conclusion

The results of this study suggest that the cooperative gameplay differs between the different game designs, leading to different interaction patterns between players with unequal skills. In contrast to Seif El-Nasr et al. the camera being led by the first player did not necessarily seem to lead to a negative interaction pattern between the players in *LBP*. We conjecture that it is not a single game design pattern, such as camera setting, that leads to a negative gaming experience for players with uneven skill levels. Instead it is the combination of game design patterns that either facilitates or hinders the balancing of skill levels between the players. Designs where the lack of skill on behalf of one player holds back the progression of the other player can create tension and frustration, such as in *Trine*. In contrast, designs in which skilled performance of one player can help the game's progress for all players, such as *LBP*, lead to less frustration. While the data in this study is limited, the interaction patterns presented here in combination with the analysis of the cooperative game

design features present a basis for further research. As Voida and Greenberg (2009) indicate, it is important to provide modes of play that allow players with different skill levels to play with or against each other. Game designers thus have to be very aware of how (combinations of) challenges and game mechanics in combination with a difference in skills affect the interaction between players. The combination of game mechanics in *Trine* is just an example of how a game design can in fact hinder skilled performance by one of the players, and therefore frustrate the collaboration between players with different skill levels. Other combinations of game mechanics may lead to similar results.

These results indicate that difference in skill is indeed an important factor in how the interaction evolves and is valued. However, there may also be game themes that are generally more attractive to some players, and players may respond very differently to different themes. Furthermore, it is clear that the relationship between the players, as well as their knowledge about a specific game, plays a role in how the collaboration is experienced as well. This is an interesting topic for further research.

References

Aarsand, P.A. (2007). Computer and video games in family life: The digital divide as a resource in intergenerational interactions. *Childhood: A Global Journal of Child Research, 14*, 235-256.

Björk, S., & Holopainen, J. (2005). *Patterns in game design*. Hingham, M.A.: Charles River Media.

Frozenbyte. (2009). Trine. [PS3]. Helsinki, Finland: Nobilis.

Jordan, B. , & Henderson, A. (1995). Interaction analysis: Foundations and practice. *The Journal of the Learning Sciences, 4*(1), 39-103.

Media Molecule. (2008). Little Big Planet. [PS3]. Foster City, CA: SCEA.

Mondada, L. (2013). Coordinating mobile action in real time: the timely organization of directives in video games. In P. Haddington, L. Mondada & M. Nevile (Eds.), *Interaction and mobility : language and the body in motion* (pp. 300-341). Berlin: De Gruyter.

Reeves, S., Brown, B., & Laurier, E. (2009). Experts at play. Understanding skilled expertise. *Games and Culture, 4*(3), 205-227.

Seif El-Nasr, M., Aghabeigi, B., Milam, D., Erfani, M., Lameman, B., Maygol, H.I., & Mah, S. (2010). *Understanding and evaluating cooperative games*. Paper presented at the Proceedings of the 28th international conference on Human factors in computing systems, Atlanta, Georgia, USA.

Sjöblom, B. (2008). Gaming as a situated collaborative practice. *Human IT, 9*(3), 128-165.

TT Games. (2007). Lego StarWars: The Complete Saga: LucasArts.

Voida, A., & Greenberg, S. (2009). *Wii All Play: The Console Game as a Computational Meeting Place*. Paper presented at the Proceedings of CHI 2009, Boston, MA, USA.