

The Impact of Visual Feedback on Character Choice

Exploring how the VFX of ultimate skills affect player choices in mobile games

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Bachelor thesis 30 hp
Media Technology | HT2024/VT2025
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Impakten av visuell feedback på spelfigursval

**En utforskande studie i hur utseendet av ultimata
förmågor påverkar spelares val i mobilspel**

Abstract

Visual feedback is a tool used in order to communicate to the player what effect their input has on the game. Previous research has looked at how visual effects (VFX) can be used, but not how they could impact the players character choices. The type of VFX that is examined in this study are those belonging to the character's ultimate skills. In this study, six people have played a game where character choice is an important feature. The participants were interviewed using the method *Stimulated Recall*. These interviews were analyzed using a *Thematic Analysis* method. The results of the study indicate that certain visual cues in ultimate skill VFX impact player perceptions, which in turn affect character choices. These visual cues were categorized into the following themes: perception of role and efficiency, connection and weight, contrast, amount of detail, and visual delegates.

Keywords: VFX, ultimate skill, character choice, visual feedback, juice

Abstrakt

Visuell återkoppling (visual feedback) är ett verktyg som används för att kommunicera till spelaren vilken effekt deras input har på spelet. Tidigare forskning har undersökt hur dessa visuella effekter (VFX) kan användas, men inte hur de kan påverka spelarens val av spelfigurer. Den typ av VFX som undersöks i denna studie är de som tillhör spelfigurens ultimata förmågor. I denna studie har sex personer spelat ett spel där spelfigursval är en viktig funktion. Deltagarna blev intervjuade enligt metoden *Stimulerat återkallande*. Intervjuerna blev sedan analyserade enligt en *Tematisk analys*-metod. Resultaten av denna studie indikerar att vissa visuella ledtrådar i ultimata förmågors VFX påverkar spelarens intryck, vilket i sin tur påverkar spelfigursvalen. Dessa visuella ledtrådar kategoriseras under de följande rubrikerna: uppfattning av roll och effektivitet, koppling och vikt, kontrast, detaljnivå, och visuella delegater (Visual Delegates).

Keywords: VFX, ultimata förmåga, karaktärsval, visuell återkoppling, juice

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Introduction

In video games, Visual Effects (VFX) are visual elements that are used to enhance the general feeling of the game and to create a sense of immersion (MadVFX 2023). These can show up as fog, explosions, glitter, water, attack effects and much more. In many games VFX are used to give the player visual feedback to their actions. One form of visual feedback is *juiciness*, which is divided into two categories by Fabre et al. (2024); feedback that helps the player understand the mechanics of the game, and abundant amounts of audiovisual feedback. Deterding (2015, 313) describes juicy feedback as “varied, unexpectedly excessive sensual positive feedback on small user actions and achievements”. Deterding (2015) notes that juicy feedback is a design lens that can be used to inspire curiosity in the player, and increase the feeling of competence. Game developers do not only restrict the concept of juiciness to player feedback, but consider it a part of the overall game feel (Hicks et al. 2018). One example of a use case for juicy design is in the *ultimate attack* or *special skill* in mobile gacha games. An ultimate skill (sometimes abbreviated to *ult* (Wiktionary 2024)) is a character's strongest skill, which is often unique to them and has a cooldown which means it cannot be used as frequently as the characters normal skills. An ultimate skill triggers more impressive animations and VFX than the character's regular skills when used. In this text, the term VFX is primarily used to describe the visual elements that are triggered when using an ultimate skill. An example of the usage of ultimate skills is in *Cookie Run Kingdom* (Devsisters 2021), where the character's portrait flashes across the screen along with the ultimate skill, which has a larger VFX than the character's normal skills (see Figure 1). Ultimate skills are utilized in many mobile games, like *Cookie Run: Kingdom* (Devsisters 2021), *Genshin Impact* (miHoYo 2020), and *AFK Arena* (Lilith Games 2019), which allow for the player to build teams of their collected characters. Since every character has their own unique ultimate skill and visual feedback, they each provide a different gameplay experience. For us it becomes interesting to see how the character-specific ultimate skill VFX impacts the player's choice of characters.

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Figure 1: A character's normal attack (top) and ultimate attack (bottom). Cropped screenshots, *Cookie Run: Kingdom* (2021).

Related research

VFX and Visual Feedback

One important form of visual feedback is juice. Hicks et al. (2018, 6) found that game developers feel that it is important that the juiciness of a game matches its intended genre, otherwise it could impact the game feel negatively. Game feel is a game design concept described by Swink (2009). It represents how the player interacts with a game, and how feedback is given to the player's actions through real-time response, physical interactions in the virtual space, and polish (Swink 2009). Swink (2009) highlights feedback as an important part of the real-time response. If the player's action has an instantaneous response from the game, it becomes easier for the player to feel that their actions are connected to the game (Swink 2009, 44). If the feedback comes too late, the game instead feels unresponsive. Players also appreciate when juicy effects are relevant to the action taken by the player, i.e. nonrandom (Kao et al. 2024). The feeling of competence is increased when the visual feedback reflects the difficulty of the action (Kao et al. 2024). Additionally, Kao et al. (2024) highlight player curiosity as a potential engagement driver when it comes to juicy effects in games. Text/onomatopoeia can also be used as a form of juicy VFX, but not to the same effect as regular particle effects (Fabre et al. 2024). Furthermore, text effects help convey information to the player and contribute to stylistic choices (Fabre et al. 2024). Kao (2020) studied how players perceive juicy VFX in an RPG setting with different amounts of juice and found that players prefer medium (average) or high (above average) amounts of juiciness over none or extreme amounts (far above average). Canales and Jörg (2020) found that players prefer audio feedback over visual or audiovisual feedback in virtual reality games. This could indicate that different types of feedback have differing effectiveness depending on the game type.

Another type of visual feedback is Visual Delegates (VD). VDs are visual effects that convey sensory modalities to the player (Misztal and Schild 2022). These can be used to show when the player character gets hurt by making the screen flash red, or by a stamina bar running out when the character gets tired. Misztal and Schild (2022)

found that some players enjoy it when VDs give them both perception in the game world as well as status information. Bunyamin (2024) found that higher quality video game graphics contribute to a more positive user experience. Moreover, players find games with higher quality graphics more satisfying and enjoyable to interact with (Bunyamin 2024). Hicks et al. (2019) also found that VFX contributes to a feeling of polish and aesthetic appeal in video games, but the inclusion of such does not objectively impact player performance. Similarly, Juul and Begy (2016) found that players perceive games with juicy effects as higher quality. Juul and Begy (2016) also highlight that players feel slightly more competent when playing a game with juicy VFX, however the results of their study were not statistically significant. Seif Al-Nasr et al. (2007) emphasize how lightning can be used to convey strong emotions to the player. Additionally, change in lighting in a scene can impact the atmosphere of the game and create a sense of danger or relief. Elements such as VDs and graphical polish (in the form of VFX) and atmosphere in turn contribute to player immersion (Misztal and Schild 2022; Hicks et al. 2019; Seif Al-Nasr et al. 2007).

Character choice

There are several factors that affect the player's choice of characters in games. Kukshinov and Shaw (2022, 96–97) found that players tend to pick characters that align with the setting of a game when it comes to unrealistic game worlds. This is especially notable if the players are given the chance to play as a non-human character (Kukshinov and Shaw 2022). Additionally, in realistic settings individuals from marginalized backgrounds tend to choose characters that they feel represent them in some way, whilst non-marginalized people do not have the same preferences (Kukshinov and Shaw 2022, 95-96). Kukshinov and Shaw (2022) note that this can act as motivation for game developers to create more diverse playable characters. Furthermore, the player's choice of character heavily relies on aesthetic appeal (Kukshinov and Shaw's 2022, 95; Kim, Kim and Mattila 2012, 87). Players also prefer when the roles of the characters align with their appearance (Kim, Kim and Mattila 2012, 87). When it comes to first impressions, it only takes 100 milliseconds

of exposure to a stranger's face to form an opinion on them (Willis and Todorov 2006, 594). Longer exposure allows for deepened and more confident opinions which extend from the first impression (Willis and Todorov 2006, 597). This could indicate that the first impression can have a big impact on the player's perception of a character.

Visual feedback and positive associations

Players tend to feel as if they perform worse when experiencing higher amounts of in-game deaths and failing to kill many enemies in harder game difficulty conditions (Klimmt et al. 2009, 7). In connection to this, players feel a higher amount of enjoyment when they consider their performance good (Klimmt et al. 2009). Similarly, Shafer (2012, 726–727) found that players experience an increase in enjoyment when winning, or succeeding in a level, in player versus player (PvP) and player versus environment (PvE) settings. When reaching success conditions in a game, developers can provide the player with positive juicy feedback. One such form of positive juicy feedback is to give the player a feeling of reward (Hicks et al. 2018, 6). This means that the player should be able to associate certain visual feedback with the sense of being rewarded. This could indicate that the positive feelings of accomplishment (i.e. winning a game) might have a chance of carrying over to the associated visual feedback, becoming a sort of pavlovian conditioning (Rescorla 1988, 151). This positive emotional connection to certain visual stimuli then potentially has the capacity to extend to juicy ultimate skill VFX, which in turn could impact players character choices.

Purpose and research question

The purpose of this study is to explore what effect visual feedback has on players character choices in a mobile game. This has the possibility to help inform how ultimate skill VFX can be used in similar games to affect the player experience in different ways.

RQ: How does the visual feedback of ultimate skill VFX affect character choices in mobile games?

Methods

Data collection

The method *Stimulated Recall* (Pitkänen 2015) was used for the data collection of this study. This method allows for the participants to easily recall the gameplay and describe the reasoning behind their choices and feelings. Having the VFX on a recording also allowed for easier communication between the participants and the researchers when referencing effects that were hard to describe. The play session was timed and stopped after 30 minutes for each participant. All participants played the game on the same phone (an iPhone 15) to ensure that there were no technical differences that could have had an impact on the results. The phone screen was recorded using the phones built in screen recording function. During the play session, a stopwatch was used to take note of important time stamps for the recording. The participants were interviewed for 20-30 minutes immediately after the play session, using a semi structured interview format. The interview questions primarily asked what impressions the VFX gave the participants, how effective the VFX felt/what effect it had, and how the participants chose their characters. The sample size consisted of six Swedish individuals (4 female, 2 male, aged 20-21) who participated on location in Stockholm. All interviews were held in group rooms at Södertörns library, to reduce the risk of environmental factors causing distraction or influencing the results. The interviews were held in Swedish to allow for easier communication, since all participants spoke this language fluently. The participants were recruited through a convenience sampling, where mutual friends recommended them. A criteria for participating was prior familiarity with mobile gaming, to minimize the need for guidance during play. A pilot session was held to test the game, interview questions, and equipment. The data from the pilot session was not used in this study.

The game used for this study was *Cookie Run: Kingdom* (2021). This game includes ultimate skill VFX with juicy design, and allows for the player to choose their own characters for their team. The game is designed so that the player receives the same five characters in the beginning, and is able to randomly receive others later on. The

participants all received at least three additional characters during their play sessions, and these differed for each participant. During the play session the participants were told to focus on the parts of the game involving PvE. When playing, the participants were told that they were allowed to skip story-elements, which all of them did. The participants also had the option to play the PvE instances on auto-mode, which means that the ultimate skills are triggered automatically instead of by user input. All participants had auto-mode turned on for large portions of their non-tutorial play time.

Data analysis

When analyzing the data, we performed a *Thematic analysis* (Braun and Clarke 2006), where patterns in the data were categorized into themes (Figure 4). The coding of the data was done by both researchers to make certain that no important information was missed. To ensure that the codes were assigned to their proper themes, they were iterated upon several times during the process of analysis. It is also worth to note that one of the interview recordings had low audio quality. The quotes from this recording with several indecipherable words were discarded and have not been used in the presentation of our results.

Results

In this section we present the results of our data gathering. All participants had the same five starter characters in common; Gingerbrave, Strawberry Cookie, Wizard Cookie, Chili Pepper Cookie and Custard Cookie III (Figure 2). During the play sessions the participants did not choose to thoroughly read about the characters actual functions. In the interviews, it instead became clear that they had based their impressions on the visual cues provided by the characters ultimate skill VFX. These impressions affected how the participants viewed the characters, which in turn contributed to their motivations for choosing certain characters. The participants predominantly chose to play with the characters they liked the most, and the motivation for these positive emotions were most often based on their ultimate skill VFX. Certain visual elements stood out in the interviews, and we categorized them into the following themes: *Perception of role and efficiency*, *Connection and weight*, *Contrast*, *Amount of detail* and *Visual delegates*.

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Figure 2: Chili Pepper Cookie (bottom left), Strawberry Cookie (top left), Gingerbrave (middle), Custard Cookie III (top right), Wizard Cookie (bottom right). (@CRKingdom 2021)

Perception of role and efficiency

This category encompasses how the participants perceived the roles of the characters, which they primarily based on their ultimate skill VFX. Since the participants did not read the actual skill functions, they attributed progress in the game to the ultimate skills triggered around the same timeframe. Only one of the participants looked closer at the character profiles, however this was towards the end of the play session. Two of

the participants expressed that they took no great interest in reading about the character's skills, and instead chose their characters randomly.

“I didn’t have the energy to read a bunch of info about damage and that stuff, so I just went with pure chance and waited to do so.” (P5, translated from Swedish)

The participant that took a closer look at the character profiles expressed that the final impression of one of these characters was slightly impacted by this new information. Without this information the first impression of the character was negative when solely based on the ultimate skill VFX.

“(…) Later I went in and looked at their skills because I felt like they should have different roles. Then I understood that it might be a tank, the cookie's task isn’t to do damage but to take it. Then I understood it a little better, because at first I thought it was fairly useless.” (P4, translated from Swedish)

Another participant reflected on this as well, and understood that basing your opinion on just the VFX would not contribute to understanding the full character and its potential. However, this participant also resonated that the game wanted to visualize the strength of the character through the ultimate skill VFX.

“I think they want to visualize, especially for someone like me right now who is just skipping through everything. They want to show me that this one has the coolest effect, so it’s stronger than Gingerbrave. But I also think that if you read what the effects do then you have to adjust yourself to the [actual functions of the game]. Because you probably can’t base everything on what’s the coolest.” (P5, translated from Swedish)

When asked about what effect the ultimate skills had on the battle, the participants would often describe the visual cues that the VFX displayed. For example, if a character had a VFX that covered all of the backline enemies the participants would think that the skill affected the entire backline. This would often be accompanied by how efficiently they thought the character performed based on its effect on the enemies.

“It felt like she took care of them, like, the ones in the back fairly quickly. And again because she- it’s not just that she hits once, she goes back and forth and then forwards. So again, repetitive motion and she does kinda good damage, or that’s how I perceived it anyways. And she takes care of the ones in the backline. Everything in one becomes a good character, I think.” (P3, translated from Swedish)

The participants' impressions were also affected by the comparisons that they continually drew between their characters.

“Whilst Gingerbrave did a stab, like a little more than a stab, she spun around. So maybe a little less [damage], but more [attacks] more times. So, if she would get disrupted in the middle of an attack it would do a bit less [damage] than those stabs. But if she went the whole way through it would do quite a lot of damage, I think.” (P5, translated from Swedish)

One participant expressed that Gingerbrave (the starter character) felt less effective due to the overall look of his ultimate skill VFX compared to that of the enemies.

“Maybe the first cookie. I’m still unsure about if it’s supposed to do a lot of damage. Its attack disappeared alongside bigger enemies

because it was just kicking which wasn't very effective.” (P4, translated from Swedish)

When asked why they had a positive impression linked to one character, P6 explained that it was rooted in its VFX. The animation showed the character striking the enemies several times.

“The fact that it did damage on many [enemies] at the same time over a longer period. It stood and swung its club. I perceived it as quite strong because it hit several times. It felt like it did more, even though it maybe didn't.” (P6, translated from Swedish)

The majority of the participants did explain how their impressions of the characters' skills may not have been correct. However, they based their understanding of the functionalities of these characters on their VFX. Additionally, these impressions motivated their character choices, even though they acknowledged that they often were guesses.

When asked about the first character presented to the player in the game (Gingerbrave), the participants all called this a “beginner character”. The reasoning was both based on the fact that it was the initial character, but also on its VFX. Gingerbrave's ultimate skill VFX shows him dashing forward with his candy-cane towards the enemies with a faint yellow glow showing him speeding up. The VFX is not very embellished compared to the rest of the characters.

“It wasn't anything special, because I understood that it was the first cookie you get in the game, so there is nothing special about it. It just had a normal attack and no unique ult.” (P6, translated from Swedish)

For some participants, one of the most important features of the characters is their visual design. However, if the character is perceived as useful their efficiency in battle might be prioritized over aesthetic appeal.

“I’m a very visual person, so sometimes I look at a character and go ‘oh, how pretty, I like this one’ or ‘oh, this one wasn’t so pretty, I don’t like it’. But if they are very good at what they do I will start liking them more and more because they are useful. So maybe a bit shallow, but yeah.” (P3, translated from Swedish)

Connection and weight

In this study, connection refers to whether or not the participants were able to connect the ultimate skill VFX to its respective character. Weight explains how much impact and power the participants felt a VFX had. This was most frequently noted for characters whose VFX had a strong connection, which often were those that swung a melee-weapon. These are weapons that are used in close combat, which both Chili Pepper Cookie (knife) and Strawberry Cookie (lollipop-sledge) had. One participant noted that they had a preference for melee attacks over magic/ranged ones.

“I don’t know, I think it’s clearer in my head... I partly like the animation more, and I feel like it looks like they do something. That they actually contribute, and it feels like they have more weight and power in what they do even if they just spin around with a little sledge hammer.” (P1, translated from Swedish)

Another participant noted that an attack VFX with more weight to it felt more satisfying.

“I like it when characters have stronger attacks. I feel like it’s very satisfying to see them throw or do heavier attacks.” (P3, translated from Swedish)

One participant failed to connect the character Wizard Cookie to its VFX, which resulted in this character not being noticed. The participant had no issue remembering the rest of the characters on their team. This meant that a lack of connection caused a character to be less memorable.

“Yes, the ones that had a lot of movement [were noticeable]. Because the ‘Lightning strikes’ - the wizard - he just stood at the back and said ‘Lightning strikes’ and it came. (...) And then that circle, what was it called? (...) I didn’t understand what it was. I thought it was something for everyone. A collective magic circle. (...) I didn’t know that the wizard was there. I didn’t see him.” (P2, translated from Swedish)

We asked why this character had not been switched out, but since the participant had not noticed the character during their play session there had been no impression formed around it. Instead, the characters that stood out had reasonings for being chosen to play with. This character notably did not have any melee-attacks and instead waved a staff and summoned a magic circle at the other side of the field.

For others, the constant visual stimuli made it harder to distinguish the different ultimate skill VFX from each other and to connect them to their respective characters. One participant noted that the characters whose skills reloaded quicker were easier to remember and connect.

“Yes, I would say... Or not the effect in itself, but he is one of four-five characters and then you have five of them doing ults within

seconds of each other, and there is a lot happening at the same time on the screen. But I think his one was the one that took the longest to reload, and Gingerbrave's attack takes the shortest to reload so you notice him all the time." (P5, translated from Swedish)

For P1 it was hard to keep focus during some parts of the gameplay due to the amount of visual cues happening at once. This impacted the ability to connect the characters and their ultimate skills.

"I felt very overstimulated by everything that was happening. There were popups and images to the left, right, down." (P1, translated from Swedish)

It is worth to note that P1 decided to skip through most story elements and tutorial information, which in turn could have contributed to a feeling of overstimulation.

Contrast

In this study, a high contrast ultimate skill VFX refers to an effect that stands out against the background and other characters/effects. A VFX with low contrast is instead one that blends in with the other visual elements of the game. In some cases, higher contrast VFX left a bigger impression on the participants in comparison to their lower contrast counterparts. The main elements that contributed to contrast were position, movement, color and overall diversity. One participant had a hard time understanding one character's purpose, and when asked why, highlighted that VFX positioned at the back of the screen were harder to notice.

"I probably would have said that it has more to do with it being very centered. Like, these middle attacks from the Wizard or the girl who stabs, where you see her go across the whole screen or the wizard

who goes (participant imitates lightning sound effect). But this [character's attack] is just straight and at the back. I think you focus more on the enemies who are at the front, so the last thing you look at is at the back.” (P5, translated from Swedish)

Two other important factors that contributed to high contrast in the VFX were movement and color. Characters that had a lot of movement were more easily noticeable and more memorable to some of the participants.

“Maybe because I saw her more, I don't know. I looked at her every time she spun. Maybe it's because it was more (...) attention grabbing. Because there's a movement on the screen. Because I didn't look directly at the other characters.” (P2, translated from Swedish)

Contrasting colors also helped certain characters stand out more than others.

“The red one. (...) I like that she has movement in her [VFX]. It catches the eye a bit (...) It was very clear when the characters got healed, not just because of their health bar, but also because there was a green light. I thought it was clear and good.” (P1, translated from Swedish)

Another participant noted that the contrasting colors made the characters more memorable.

“Yes, that might be why I remember her and the sledge-girl more. It might be because of the contrast. It's a green surface and the others are a little more brown-yellow in color, so it could be that I just think they are more visible because they are more red in color.” (P2, translated from Swedish)

One participant expressed that due to the VFX being diverse, it was easy to distinguish the characters from each other. This also prevented the participant from mixing up the characters' VFX and made the perceptions of their purposes in the game grounded in the visual input of the corresponding characters. In practice, this meant that this participant did not mix up the magic circle of Wizard Cookie with the knife slashing of Chili Pepper Cookie.

“I think I understood what every character did because they felt so different so it felt like it was hard to... It felt like you wouldn't make the mistake of mixing them up and being like ‘what does this one do?’” (P3, translated from Swedish)

Amount of detail

The participants often pointed out the amount of detail in the characters' ultimate skill VFX. Different visual elements such as size, color, and overall level of detail impacted how they viewed the characters' ultimate skill VFX. A common theme found was that participants would have a more positive impression of VFX with a higher amount of detail. When using a new character, the participants compared the ultimate skill VFX with their previous characters, which often affected the impressions of those characters.

“It pretty much confirmed to me that he was weaker. Especially when I got the event cookie who was like, that ult versus the first cookies ult, it was such a big difference. (...) I thought it was so cool because it was very beautiful visually, and it did a lot of damage so those were two things I like in one. She quickly became my favorite. [The ultimate attack] did a lot of damage and it was big and beautiful. It felt powerful because of the size too. And of course the damage.” (P3, translated from Swedish)

One participant expressed that the character with the most detailed VFX was their favorite. This was also the character that they thought was the strongest on their team.

“It felt the most powerful. I think it also took the longest to recharge. It happened more rarely, but because it took up so much space on the screen it was really hard to miss. It was like alright, don’t mess with the [Squid ink] cookie. Very aggressive and over the top attack. It makes the one at the back look weaker. It looks the coolest that way. (...) It felt like it was a more rare character and it was more... It felt like more effort had been put into the effect (...) so it felt like it was the best ult visually.” (P5, translated from Swedish)

When triggering the ultimate skill, the character portrait flashes across the top of the screen for a moment. One participant had experience with other games in the same genre where the ultimate skill would trigger a visual that covered the screen. Although some participants felt like a bigger, more detailed VFX was better, this participant preferred being able to see the other characters and enemies on the screen when using their ultimate skills.

“At first I felt like it was very clear that there was an ultimate attack because all of the special effects around the screen. And in gacha games there is usually some sort of animation or effect to tell you that you’re ulting. (...) It didn’t cover the whole screen which can feel nice since there are so many cookies and enemies.” (P4, translated from Swedish)

All participants wanted to replace Gingerbrave, who had the least detailed VFX. Additionally, some participants expressed that they would replace a character

with a less detailed VFX for one that had more detail. They often correlated a more detailed attack with doing more damage.

“I would have switched out the first character. The gingerbread. Because even if he had these attacks it felt like there are other characters who could basically do the same thing as him but more, and maybe even look cooler. Both the character design and the attack.” (P3, translated from Swedish)

One participant thought that the lack of detail meant that it was a character that should be replaced.

“[The ultimate attack] was a bit minimalistic. You notice that this character could always be upgraded or replaced by someone stronger.” (P5, translated from Swedish)

Two participants noted that the game would have been more boring without the VFX. For one of them, this resulted in character choices based on wanting to experience more visual stimulation.

“I just wanted something new all the time. I just wanted new characters all the time. I am, what can you say, the consumer. I just wanted new things, I was an iPad baby. An iPad baby who just wanted to see new things all the time. I wanted visual stimuli.” (P2, translated from Swedish)

Visual delegates

As mentioned previously, VDs are visual elements that help visualize sensory modalities to the player (Misztal and Schild 2022). Certain VDs related to the ultimate skill VFX were pointed out by the participants as something that contributed to how

they viewed the characters in the game. The most important VDs were health bars that showed when the characters and enemies lost/gained hit points (HP), and the recharge timers on the characters ultimate skills (Figure 3). One participant also highlighted a positive impression of when a characters' VFX was relevant to the amount of damage the effect did.

“I like it when you can see... When there’s something visual that represents how much damage [the attack] does. Because I feel like with the event cookie, it does so much damage and it feels like you see the laser beam (...) The damage was powerful and visually [the attack] was also powerful so it matched. I like that.” (P3, translated from Swedish)

The participants would continually compare their characters to each other. This was especially notable in the context of the initial usage of a character. An important point of comparison was how much HP reduction they could see the ultimate skills causing when triggered. In the game, this is shown by a minus sign followed by numbers in red above the head of the character taking damage. The characters that caused less damage would often be viewed less favorably by the participants.

“I don’t know if she had some sort of finishing blow that took off a bit more [HP] than what she did during the attack, but it felt like her spin- It didn’t do a lot and it didn’t take off a lot [of HP]... And it might be a bit biased but I like seeing when [the HP are] reduced. I felt like I could just switch her out.” (P3, translated from Swedish)

One participant also thought that a character visually causing more damage was a sign that it was better.

“It wasn’t very effective. I felt like the others in the team were better.

Then you received the one that was like an epic cookie, what was her name? Chili I think... For example, she was a lot better and did a lot more damage than he did.” (P6, translated from Swedish)

P1 took note of the visual delegates related to the healing effects, and had a very positive impression of the healer character based on how it saved the other characters on the team from dying. However, P1 did not entirely understand what the visual cues of the healing effect meant.

“And then when you see the healer still recharging (...) It was a real nail biter! (...) And I didn’t understand what that little blue line [meant]. Because I understood that when they were healed a blue [line] appeared and it got filled with green. But then it had a small blue line over it that I didn’t understand what it was. Was it some sort of immunity?” (P1, translated from Swedish)

When asked about which character they felt had the biggest impact on the PvE matches, P2 based the answer on the character's recharge times. The recharge times differed between characters.

“I think it’s because in other games I’ve played, the ones that have longer recharge times tend to be stronger characters. But I’m not sure.” (P2, translated from Swedish)

Another participant resonated similarly, and expressed that a longer recharge time is an indication of a stronger character.

“It shows which one is the strongest and which is the weakest. Because if you have one who has a shorter [recharge time], generally, they do an attack that does less damage. Then if you have a stronger [character] it usually does more damage. So [the recharge

time] shows the different strengths of the characters. That, and a difference in importance. When you use them during boss fights you might want to use the ult first and then normal attacks whilst the stronger one recharges.” (P5, translated from Swedish)

P5 also felt like the recharge timer could impact in which order the ultimate skills should be triggered.

This image has been removed in the digital version due to copyright reasons.

Figure 3: Ultimate skill recharge timers. Cropped screenshot, *Cookie Run: Kingdom* (January 13, 2025)

Discussion

From our results we have gained an insight into how some players perceive ultimate skill VFX and how these effects can impact character choices. These perceptions were based on different visual elements of the characters ultimate skill VFX. One important

factor was how the participants perceived the characters' roles and their efficiency in the game. Our results were similar to Kim, Kim and Mattila (2012) who found that players enjoy when character designs align with the characters' roles. In our study, this extended to the characters VFX. It was easier for the participants to understand the role of a character if the VFX reflected it well. The majority of the participants based their impression of the characters on their ultimate skill VFX. This impression could be wrong, which in turn could indicate that players form false impressions on characters whose VFX does not align well with their purpose. However, this was something the participants were conscious of. They were still able to recognize if the visual feedback was positive or negative, which helped form their opinions. Although the VFX were the primary factor when it came to character choice, the reason behind why a character was the participants favorite often relied on character design as well. Adjectives commonly used to describe these characters included “cute” and “beautiful”. These are two important factors that Kim, Kim and Mattila (2012) highlight when it comes to gamers preferences in character designs. However, the participants would still choose characters whose design they disliked if they thought this character was effective in PvE. In our results, this shows a prioritization for performance over aesthetic appeal. Furthermore, the first impression seemed more malleable in our study compared to what Willis and Todorov (2006) had found. We saw a shift in impression from the initial character encounter to when the ultimate skill VFX was first triggered. This meant that a bad first impression of the character design could be changed by the impression of the VFX. The first impression of the VFX helped the players form an opinion on what role the characters had. This impression did not seem to change much from the initial encounter. This is something Willis and Todorov (2006) found about the first impression as well, noting how further impressions are formed through the first one. In our results this means that the impression of the VFX had a chance of overriding the impression of the character design. It is also worth to note that the participants continually compared the characters to each other, which affected their overall opinions.

We were not able to establish a clear connection between winning/losing and positive/negative associations to VFX during our research. This was due to no participants experiencing losing conditions during the data gathering, which resulted in no opportunity for comparison. Shafer (2012) notes how players feel more enjoyment when winning in PvE situations. In our results, the participants largely developed positive associations to the characters whose ultimate skills appeared to have a large impact during the PvE settings. In contrast to this, the participants formed negative impressions of the characters who did not seem to contribute as much. Some participants formed a sense of security around the character who they felt dependent on in order to reach winning conditions. Notably, this character was usually one with healing abilities. Klimmt et al. (2009) note how players evaluate their performance based on in-game deaths/enemy kills in harder game difficulties. In our study, the players only played through the beginning of the game where the levels are less challenging, and often attributed their success to their team composition rather than their own gameplay. Therefore it might be hard to compare our results to Klimmt et al. (2009). More interesting results could be obtained if tested on levels with increased difficulty. To establish whether or not there could be a connection between winning/losing and positive/negative associations connected to ultimate skill VFX, this would have to be tested more thoroughly. However, our results show that there could be a connection between the perceived impact of a VFX and positive/negative association in general.

Another important factor we observed was the feeling of connection between characters and their ultimate skill VFX. The characters whose VFX did not stand out as much were harder for the participants to connect to their respective characters. This resulted in the participants not forming broad impressions of these characters and in a difficulty interpreting their roles. Notably these characters often had ranged skill VFX that the participants felt were less connected to the characters. These VFX were often magic attacks, resulting in some participants having a preference for close combat VFX. One participant failed to connect the Wizard character who had a ranged skill to its VFX. This character's skill would show him doing a small animation to the left of

the screen, and a magic circle effect appearing to the right of the screen. Another participant highlighted how, as the player, you would keep your eyes on the enemies during gameplay. The enemies are to the right of the screen in this game, and the player characters are to the left. This might have been a reason as to why the other participant did not connect the Wizard character to its VFX. This shows that it is important to bring the player's attention to the character as its ultimate skill is triggered if the effect is ranged. The VFX that were easier to connect were often close combat ones, which had a greater feeling of impact. The feeling of weight and impact is a form of polish that contributes to game feel (Swink 2009, 151–52). Swink (2009) describes this as a soft metric, which is a more subjective form of game feel. Some of the participants pointed out this feeling of impact as something positive. Others did not take note of it. However, for those that did it was a very important component. VFX that felt impactful on the enemies were thought of as satisfying and were also preferred. This aligns with Bunyamins (2024) findings that show that players find higher quality graphics more satisfying to interact with.

Contrast was an additional theme that contributed to character choice. In *Cookie Run: Kingdom* (2021), the character's ultimate skills are often triggered at the same time. This means that the screen is often covered in many different juicy effects simultaneously. Kao (2020) found that players prefer medium/high amounts of juice over extreme amounts. Kao (2020) describes medium amounts of juice as the average for the RPG genre and extreme amounts are far above average. Contrary to this, we found that some participants enjoyed a large amount of visual stimuli, where the screen was covered in several large VFX at the same time. However, others found these overlapping effects overstimulating. The ability to differentiate the characters from each other decreased when multiple effects were active. This meant that the participants had a harder time understanding the effects, and this sometimes even prevented them from noticing certain characters. This was especially noticeable with the participant who did not notice the Wizard character on their team. The characters that were most memorable to the participants were the ones that were more contrasting to their surroundings. Notably, the characters with red color palettes (Chili

Pepper Cookie and Strawberry Cookie) were highlighted by the participants. These characters were also pointed out because of their animations. The factors that contributed most to contrast were color, movement, and size. When it comes to size, the effects that covered large portions of the screen and were difficult to miss. The opposite was true for smaller VFX.

The amount of detail of a VFX also played a part in the participants' character choices. The VFX with more detail were generally more juicy. Hicks et al. (2019) point out how juicy VFX contribute to a feeling of polish and aesthetic appeal in games. This was noticeable in our results as well, where the participants gravitated towards characters with juicier and more detailed effects. Additionally, the participants believed that a higher detailed effect was a sign of a stronger character. This resulted in the participants wanting to replace the characters with less detailed VFX. However, when asked why they picked certain characters the answer was often for utilitarian purposes. The participants often noted how the most effective characters were the ones with the most impressive VFX. This shows a possible overlap in aesthetic appeal and perceived utility in our results, similar to Juul and Begy's (2016) findings on how players feel more competent when presented with juicy effects in games.

Similar to Misztal and Schild (2022), we found that the visual delegates in the game were appreciated by the participants. These VDs became an important tool for the participants in order to understand and analyze the ultimate skill VFX. This indicates that VDs can be an important complement to VFX, to help provide more information to the player. Since our participants did not read about the characters' functions, the VDs provided more context clues to their abilities. Fabre et al. (2024) note how text can be used in addition to particle effects when creating juicy VFX. For our participants, the text showing how much HP was lost/gained when triggering ultimate skills was an important factor when it came to character impressions. This showed up as numbers above the character and enemy sprites, indicating that HP was gained (green text, plus sign) or lost (red text, minus sign). This was something the

participants often thought signalled how strong a character was, which in turn impacted their character choices. This shows that VDs helped the participants understand the status of the characters during play. Some participants highlighted the visual HP loss/gain as a very positive addition to the VFX. This supports Misztal and Schild's (2022) findings on how players want VDs to convey immediate status information.

Limitations and future research

There are some limitations to our study that are worth discussing. Firstly, we had a limited sample in a small age-range, with minimal experience with the game genre. Our results reflect our participants' experiences but may not be entirely applicable to the broader audience of the game. However, our study is meant to be an exploration of the subject, which more deepened research could build on. The choice of game could also have had an effect on the results. In the chosen game, the player has to choose several characters for their team. The results may have varied if a game where the player only uses one character at a time had been chosen. Having to consider the characters' roles on the team could also have played a part in the participants' character choices in this study. Additionally, the time limitation to the interview sessions may also have had an effect on the results. Allowing for the participants to play the game for a longer time could have allowed for a deepened understanding, which could have resulted in additional interesting data. It could also have been interesting to see if the results would have differed if the players were told not to use the auto-play function in combat. This could have allowed for a stronger impact of the visual feedback. However, since the auto-play function is available, it is a way for the player to interact with the game. Some players will choose to play the game this way, and our results predominantly reflect the experience which is provided by this play style.

Our study has explored how visual feedback impacts character choice. For future research, a broader sample could be studied in order to more accurately understand

this subject. In this study, we have seen how character-specific VFX impacts the perception of characters. Previous research has looked at how players perceive character design (Kim, Kim and Mattila 2012; Kukshinov and Shaw 2022). Our results indicate that there could be a connection between character design and character-specific VFX when it comes to player impressions. For future research, it could be interesting to see how character design and VFX appearance interact, and in turn how these affect player perceptions.

Conclusion

Our results indicate that player behavior can be controlled through the appearance of ultimate skill VFX. The impressions that the participants received from these VFX were the main motivation behind their character choices. The most important factors that affected these impressions were the perception of role and efficiency, connection and weight, contrast, amount of detail, and visual delegates. VFX with a larger amount of detail and VDs seemed stronger to the participants, whereas a lack of detail

and VDs made the character seem weaker. Factors like connection and weight and contrast made it easier for the participants to remember characters. Additionally, a VFX with stronger impact felt more satisfying. In order for the characters' roles to be accurately perceived, the VFX needed to have appropriate visual clues. In conclusion, the participants' character choices were heavily affected by whether their impression of the ultimate skill VFX was positive (keep in team) or negative (remove from team). Positive impressions were characterized by high amounts of detail, high contrast, and VDs as well as a feeling of connection, weight and impact.

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Appendix

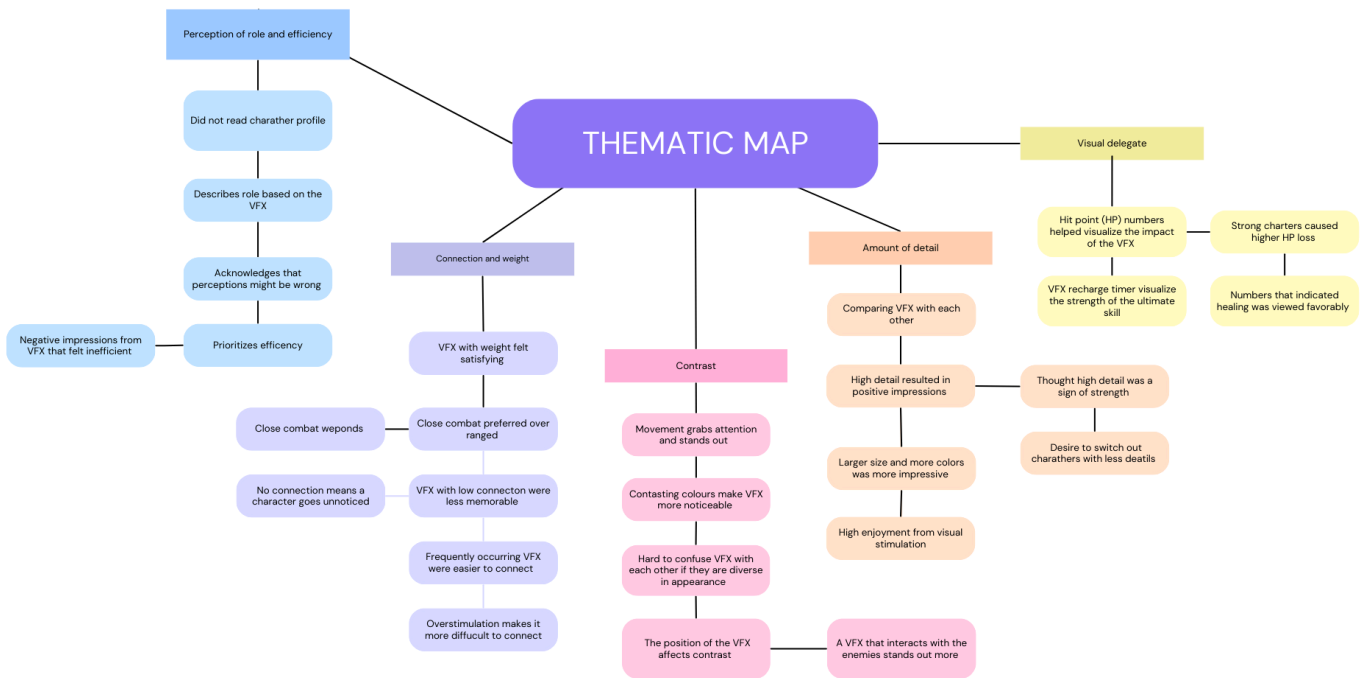


Figure 4: Thematic map