How expert players choose and play strongly identifiable characters

A study of how players behave and strategize in character-based shooter games

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**Sammanfattning**

Olika spel har olika val för spelare vad gäller spelkaraktärer. I en del spel får spelare välja mellan karaktärer med definierade utseenden, egenskaper och roller. En typ av dessa spelkaraktärer kallas hjältar, vilka är skapade speciellt för ett spel eller också är de redan kända från annan media så som filmer. Online multiplayer skjutspel är en kategori av spel som kan innehålla hjältar, där spelare tävlar mot andra spelare. Detta projekt har utforskat hur olika hjältar från olika online multiplayer karaktärsbaserade skjutspel spelas. Målet var att undersöka hur expertspelare väljer och spelar olika hjältar i dessa spel genom att titta på varför spelare valde olika hjältar, deras beteende med dem och vilka strategier de använde. I projektet utfördes två speltest på två olika karaktärsbaserade online multiplayer skjutspel, en studie inkluderade intervjuer.

Studierna resulterade i olika aspekter som visades påverka deltagarnas val av hjälte och val av strategier. Dessa aspekter inkluderade interna aspekter så som deltagarnas preferenser och förväntningar, och externa aspekter så som speldesignerna och andra spelare. Det visade sig att för att göra meningsfulla beslut i spelen krävs en viss kunskap av spelen och dess hjältar. Strategier var också beroende av hur hjältarna var designade och deras funktioner. Det visades också att deltagarna tog olika beslutsvägar. Antingen så valde deltagarna först en hjälte att spela med och anpassade därefter strategierna till den valda hjältén, eller så valde deltagarna en hjälte med en strategi i åtanke. De olika beslutsvägarna markerade olika behov hos spelarna angående speldesign. Om valet av hjälte var det första så var kraven på speldesign att få en bild utav hjältens karaktär, om istället valet av strategi var det första så var kraven på speldesign mer om att få information om funktionaliteten hos hjältarna.

**Abstract**

Heroes are a category of game characters that have a defined set of abilities and predefined roles. Depending on game, the heroes have different functionalities and roles, and are either created for the game and its lore, or are already known from other medias. Heroes occur in different types of games, including online multiplayer shooter games where players compete online in teams against other players. The following project has focused on exploring how different kinds of heroes, in different online multiplayer character-based shooter games, are played. The aim of the project was to investigate how expert players chose and played heroes in online multiplayer shooter games by looking at reasons behind hero choices, player behavior and used strategies when playing different heroes. Two playtest studies have been carried out on two different online multiplayer character-based shooter games, one study including interviews.

The result of the studies demonstrated that hero choice and strategy choice was affected by different aspects including internal factors such as player preferences and expectations, as well as external factors such as game design and other players. It was found knowledge of the game and its heroes to some extent were needed to make meaningful decisions in the game. Strategies used and behaviors with the heroes were dependent on the design of the heroes. Furthermore, it was found that participants took different decision paths, either first choosing hero and thereafter adjusting the strategy to the chosen hero, or choosing a hero with a strategy already in mind. Choosing hero first, participants were affected by internal and external factors. Choosing strategy first, the influencing aspect were only internal. These paths highlighted different player needs in game design. If choosing hero first the player needs concerned understanding the hero as a character, and if choosing strategy first the player needs concerned getting information about the functionality of the heroes.
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## Glossary

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<tr>
<td>Abilities</td>
<td>Functionality of a character, for example powers and skills</td>
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<tr>
<td>Antisocial behavior</td>
<td>Destructive behavior, actions that hinders or frustrates other players</td>
</tr>
<tr>
<td>Autonomous playstyle</td>
<td>Playing independently for own goal and intentions</td>
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<tr>
<td>Co-operative playstyle</td>
<td>Playing co-operatively with other players on your team</td>
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<tr>
<td>Defense role</td>
<td>Role defined as being able to interrupt enemy attacks</td>
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<tr>
<td>Heroes</td>
<td>Category of game characters that have predefined abilities and roles</td>
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<tr>
<td>Melee combat</td>
<td>Close hand to hand combat</td>
</tr>
<tr>
<td>Multiplayer games</td>
<td>Games played together with multiple players</td>
</tr>
<tr>
<td>Offense role</td>
<td>Role defined as being able to deal a lot of damage</td>
</tr>
<tr>
<td>Prosocial behavior</td>
<td>Constructive behavior, actions that benefits other players</td>
</tr>
<tr>
<td>Ranged combat</td>
<td>Attack from distance, often with weapons that requires ammunition</td>
</tr>
<tr>
<td>Stats</td>
<td>Properties, for example health of a character or range of a weapon</td>
</tr>
<tr>
<td>Strategy</td>
<td>Decision rule on how to, for example, play a game</td>
</tr>
<tr>
<td>Support role</td>
<td>Role defined as being passive and with the abilities to heal and support</td>
</tr>
<tr>
<td>Tank role</td>
<td>Role defined as being able to soak damage and affect larger areas in combat</td>
</tr>
<tr>
<td>VoIP</td>
<td>Voice over Internet Protocol, transmitting of voice or multimedia over internet</td>
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1. Introduction

2016 there were 1.8 billion gamers worldwide according to the gaming news website MyGaming (McKane, 2016). The number of gamers alone tells tales about the culture gaming has become, as well as the revenue that lies within it. Games are not only of interest for gamers, but also researchers. Furthermore, the gamers themselves have been of interest for researchers for several reasons. Research has been done regarding for example positive and negative aspects of gaming, as well as motivation behind it (Klimmt, Hefner, Vorderer, Roth & Blake, 2010). Another interesting aspect of gamers reaching beyond motivations for and consequences of gaming, are the players’ behaviors in games. Player behavior is a big area of research, with different aspects. For example, Domínguez, Cardona-Rivera, Vance and Roberts (2016) wrote about player behavior being dependent on the played character. Domínguez et al. explained that when playing games, players tended to act in ways that were consistent with the role of the character they played. The research concerned a narrative roleplaying game with defined characters. Research on player behavior with characters have mostly considered single-player games (Birk, Atkins, Bowey & Mandryk, 2016; Klimmt et al., 2010; Klimmt et al., 2009; Hefner, Klimmt & Vorderer, 2007, Flanagan, 1999). Research regarding player behavior with characters have investigated character identification, thus how a player feels like they are the character they play.

Player behavior around characters in multiplayer games have not been a focus in research to the same extent. Instead research on multiplayer games has focused on the influence of other players. This because online multiplayer games have become a known platform for interaction. This interaction between players, has been found to influence the behavior of players (Ross & Weaver, 2012; Hughes, Griffin & Worthington Jr, 2016). As mentioned, the character the player is playing as has been found to affect the behavior of the player. Furthermore, research has investigated players’ motivations behind character choices (Trepte & Reinecke, 2010). Trepte and Reinecke stated that the character choice was dependent on if the game was competitive or not and if the player was satisfied with their lives or not. More specifically Trepte and Reinecke wrote that if a game was competitive and the players were dissatisfied with their lives, they would choose a character dissimilar to themselves, and if the game was non-competitive and the players were satisfied with their lives, they would choose a character similar to themselves. The similarity regarded both properties and appearance of the player.

Expanding on player behavior is the discourse about game strategies. This since strategizing is a part of a player’s behavior in a game. Strategies were described by Harrington (2009) as decision rules describing how to play a game. These decision rules should be created in advance of playing, and Shrader and McCreery (2008) wrote that expert players have high knowledge of games and tend to conduct problem solving in advance of gaming. Relating to the influence of other players in games, Harrington (2009) further explained that in multiplayer games, players need to consider the actions of other players in order to create strategies. This because a decision made by a player is affected by and affects other players.

Trepte and Reinecke (2010) discussed the reasons behind character choices. Furthermore, in different types of games, there are different types of characters available to choose from. One of the categories of game characters are heroes. Heroes are characters that have a defined set of abilities and roles (Wawro, 2016). These characters are not customizable to the same extent as other player characters as their appearances, weapon types and abilities are defined. With that said, a lot of games including heroes allows for certain customizations such as cosmetic skins or ability boosts. The customizations do not change the heroes, but rather modifies the already defined attributes. Depending on game, these heroes are created specifically for the game and its lore, or are characters already known from other
medias, and therefore have their own lore and background stories. Example of games that includes heroes are multiplayer online battle arena games such as DOTA 2, Paragon and League of Legends, as well as shooter games such as Overwatch and Star Wars: Battlefront to name a few. Depending on game, there are different roles of heroes available, in Overwatch, heroes are divided into four different roles, while DOTA 2 has a list of 10 different roles and each hero belongs to several of these, for example. Heroes are because of their lore and background stories arguably comparable with player characters in single-player games that also are predefined, as strongly identifiable characters.

1.1. Purpose and research questions

This project aims to investigate how expert players play strongly identifiable characters in online multiplayer shooter games in the form of looking at player behavior and strategies when playing heroes. This to expand research on the relation between player behavior and character from single-player to multiplayer games with strongly identifiable characters. Two online multiplayer character-based shooter games will be considered in the project, one released game and one game that is in development at the time of the project. The purpose of the project is to examine how players choose and strategize with heroes compared to the purpose and abilities of the heroes, as well as how the used heroes and strategies relates to player behavior. From the player behavior game design opportunities for character-based multiplayer games will be discussed.

For this project, the research questions are the following:

1. What affects the choice of hero for players in multiplayer shooter games?
2. What affects the choice of strategy for players when playing heroes?
3. How is choice of hero and choice of strategy related?

1.2. Limitations

Two games will be included in the study, a released character-based shooter game and one shooter game that is in development at the time of the project. The result considers how players behave with heroes on a general level. Because of this, game specific functionalities of neither the games or heroes affects the results from the project, and therefore names for both games and their heroes will be excluded from the report. This will furthermore enable a consistent analysis for both of the games, circumventing limitations such as confidential information. The project is limited to two shooter games, as well as expert players. Furthermore, for player behavior the study has focused on strategies. This to delimit the area of research to fit the scope of the project. The project will be conducted in cooperation with EA Digital Illusions CE in Stockholm.
2. Background

This chapter will describe research considering player behavior in games depending on played character as well as the presence other players. It will also include a definition of heroes and game strategies. The purpose of the background is to increase the knowledge of the domain as well as to serve as a basis for the result discussion. The chapter will conclude with hypotheses derived from previous research.

2.1. Heroes

In many games, players are required to use characters with predefined appearances, abilities and stories (Trepte & Reinecke, 2010). Examples of these types of characters in multiplayer games are the elite classes in Battlefield 1, heroes in DOTA2 and champions in League of Legends to mention a few. Heroes are one of the categories of game characters, occurring in a vast majority of games, that comes with a defined set of abilities and predefined roles (Wawro, 2016). These heroes are either created specifically for the game and its lore, or are characters already known from other medias. Wawro (2016) mentioned Overwatch and Battleborn as examples of games where players choose between a set of heroes created specifically for the games to compete in battle arena settings against other players. One of the games using heroes already known from other medias is Star Wars: Battlefront in which players can choose to play iconic heroes and villains from the Star Wars universe (Electronic Arts, 2015). Depending on game, the heroes have different roles, in Overwatch the heroes belong to one of four different roles (offense, defense, tank, support), while in the battle arena game DOTA2, the heroes belong to several of 10 different roles. Heroes are in comparison to avatars created and customized by players more restricted in how they can be played, as their weapon type as well as abilities are defined. Therefore, the player does not have as much freedom choosing character in games with heroes as in games where they can create a character however they like from a wide range of customization options. Instead, games with heroes often gives the player the option between several different heroes, with different types of game styles. As mentioned these division of heroes can be made by giving them different roles, as exemplified above.

2.2. Behavior dependent on character

When playing games, players tend to act in ways that are consistent with the role of the character they are controlling in the game. Domínguez et al. (2016) called this the Mimesis Effect and the effect described how players role-played even when not explicitly instructed to, making decisions and actions in the game they believed fit with the played character. The study looked at a narrative role-playing game with pre-defined characters and discovered that the Mimesis Effect was stronger when the players chose their character compared to when they were assigned one. The reason for this was discussed to be that the player will choose a character they identify more with. Identifications with game characters were described by Klimmt, Hefner and Vorderer (2009) as when a player created the illusion that they became game characters, or felt like game characters while playing them.

Domínguez et al. (2016) described that the role of a character in a single-player game affected the actions of the player. In the study participants were assigned and got to choose between characters with different pre-defined roles. It therefore would be plausible that the Mimesis Effect could be found even in multiplayer games where players can choose between characters with already defined roles. Furthermore, behavior with characters have been researched extensively in single-player games, focusing on character identification (Birk, Atkins, Bowey & Mandryk, 2016; Klimmt et al., 2010;
Research has investigated the behavior of customizing characters to mimic the player, different effects of character identification, as well as the reason behind and nature of this identification. This serves to show that in single-player games the relation between character and player behavior is a relation of high interest. When it comes to multiplayer games, however, this relation is in the background of player behavior as an effect of the social aspect multiplayer games bring. To investigate player behavior dependent on characters in multiplayer games is therefore an interesting area to complement and broaden the knowledge of the player behavior-character relation. Furthermore, investigating this relationship in the context of multiplayer games with hero characters is relevant as heroes come with lore and background stories which makes them strongly identifiable compared to other multiplayer characters that are more generic.

### 2.3. Behavior dependent on other players

When playing a multiplayer game, the outcome of a player’s decision is tied to the decisions of other players, in contrast to single-player games where the decisions of the player only affects the state of the game (Ross & Weaver, 2012). Ross and Weaver discussed multiplayer games where cooperation of players was encouraged in order to win the game, and how the other players affected how a player behaved in those games. Ross and Weaver stated that the behavior of other players could serve as a guide to a player’s own behavior. This because when it comes to behavior, people observe and learn from people in their surroundings.

A lot of research has been made regarding behavior dependent on other players, for example by Hughes et al. (2016) that sought to create a scale to measure behavior in multiplayer online games. The study focused on players of League of Legends, which is an online multiplayer team-based game with a battle arena setting. The study was done in three steps, (1) Literature review and workshops where a scale of 12 dimensions of player behavior with 52 applicable items were defined, and (2) Exploratory factor analysis and reduction of the 52 items, and (3) Verification of the replicability of the scale and winnowing the scale to fit important player behaviors. The dimensions included different types of behaviors such as role choice and autonomy/cooperation. To better fit a model of a two-factor structure with anti-social and pro-social behavior, the dimensions were winnowed in the second and third step of the study, resulting in a final measurement of four dimensions with a total of six statements to measure them.

The obvious difference between single-player and multiplayer games are the presence of other players. As shown, the behaviors of choosing characters, and how to play them are consequently not only dependent on the players themselves, but also on the behaviors of the other players present when making these decisions and actions. Therefore, it is hypothesized that the other players will surface as influencers of the participants’ behaviors during the studies.

### 2.4. Character choice

As mentioned previously in this chapter, Domínguez et al. (2016) argued that players more likely will choose a character in a game that they identify more with. Furthermore, Birk et al. (2016) argued character identification is higher when the players can customize the character to mimic their own appearance, however, character identification can happen when playing a character dissimilar to the player as well (Klimmt, et al., 2009). Alas, players can identify with heroes even though heroes are restricted in customization options. Furthermore, according to Trepte and Reinecke, there is likely to be situations in which choosing a character dissimilar to the player would be beneficial in a game or
for other reasons be more appealing than choosing a character that mimic the player. Either this could be because the character has traits more attractive than the player, or because the game requires a character with dissimilar traits than the player to beat the game. Thus, the identification between the player and the character is not the sole motivation for choice of character in a game. The study concluded that players had a tendency to choose dissimilar characters when the game was competitive and needed characters with specific traits to beat the game, and when the players were less satisfied with their own lives. Contrastingly, players had a tendency to choose similar characters when the game was not competitive, and when the players were satisfied with their own lives. The similarity concerning the similarity in personality factors between the player and character (Trepte & Reinecke, 2010). Klimmt et al. (2009) described that when identifying with a character, a player will ascribe the salient properties of the played character. If a player for example feels cowardly and choose a character with courage, the level of courage will increase in the player. This enables the player to feel like, or for the time of the identification be a character with more attractive properties than the properties of the player. This explains why players less satisfied with their lives are inclined to pick characters with more attractive properties than to pick characters with properties resembling their own. If a player however is satisfied with their own properties the motivation for choosing a character with different properties may not be as high. All this, Trepte and Reinecke (2010) argued depended on the played game. The game is a simulation of the real world to the extent that the player creates a character, builds a house for the character and gets a job for the character. In this game, the character also needs to eat, go to the toilet and socialize with friends, amongst other activities to keep a good level of happiness. In The Sims, there is no reason to create a character with specific traits, because the game cannot be won. The purpose of the game is to play as a character and see how it progresses in a simulated everyday life. In The Sims players therefore have more freedom in the choice of character features and are more likely to create characters that resembles the players themselves. Contrastingly, if a player is playing a competitive game, the choice of character and their features will be adopted to be able to perform successfully in the game. Therefore, in multiplayer competitive games, a player will more likely choose the strategically good character before the similar, more identifiable character (Trepte & Reinecke, 2010). Playing multiplayer competitive shooter games with heroes, players would arguably choose characters that are more strategic, without consideration of how much the hero resembles themselves in its attributes. This because the hero choices and customizations are limited, but also because the goal of the game is to beat the opposing team. This however, does not occlude the fact that players can identify with heroes as the heroes come with their own lore and background stories that makes them relatable.

Furthermore, Lavrakas (2008) described preferences or attitudes to be strong predictors of behavior, for example, if a participant reports high preferences towards a specific game character, the predicted behavior of the participant would be to choose this character more often than other characters.

This section emphasizes that there are different motivations behind character choices, in competitive games the motivation could be whether the character will be successful in beating the game. This should become visible through this study as an influencer of the hero choice, since the games tested will be competitive. Preferences towards characters should also surface as influencers to hero choice in the study according to Lavrakas (2008).
2.5. Game strategies

Harrington (2009) wrote "A strategy is a fully specified decision rule for how to play a game" (p. 34). Preferably these decision rules should be created in advance of playing a game, but improvisation in game is likely to occur. This because, amongst other reasons, the decisions made by a player are affected by other players in a multiplayer game (Ross & Weaver, 2012). Players are furthermore dependent on other players in order to successfully beat a multiplayer game, which usually involves defeating the players on the opposing team. Multiplayer games are in this sense what Harrington (2009) referred to as social situations where the best outcome for someone depends on the actions of somebody else. When playing a soccer game, for example, whether a player kicks the ball to the right or left is dependent on in which direction the player believes the goalkeeper will move. Suppose the player kicks the ball to the right and the goalkeeper moves to the left, this leads to a high chance of scoring a goal. Would that happen, it would partly be due to the goalkeeper’s decision to move to the left. In situations like this, players are subjected to challenges in form of adapting their actions to fit with what actions they believe other players are planning to do. In order to do this, the players need to understand and predict the behavior of the other players in the game.

In games with multiple players and strategies, players can choose the same strategy as others or chose other strategies. In this choice, there are forces that can determine if a player picks the same or another strategy as other players; tipping and congestion. Tipping is when a player is more attracted to choose a strategy because a large number of players are using that strategy and congestion is the opposite, when a player is less attracted to choose a strategy because a large number of players are using it. Congestion could be described by some player choices being overcrowded, and tipping instead where more is merrier (Harrington, 2009). Furthermore, most multiplayer games are what Harrington described as asymmetric games, where players have different roles and therefore different strategies. Harrington also mentioned that even when players face the same choices, they can evaluate them differently depending on individual pay-offs.

Looking at strategies, it is obvious that they are affected by the presence of other players. In accordance with this, it would be feasible that other players will surface as an influencer to strategy choice in the studies, as mentioned earlier in this chapter. From Harrington’s description of asymmetric games, it is also likely that the role of the hero will influence strategy choice, and with individual pay-offs in mind, the choice of strategy will differ from player to player.

2.6. Summary

Regarding the above mentioned background, hypotheses can be added to the research questions presented in the introduction of this report. These hypotheses are presented below.

2.6.1. What affects the choice of hero for players in multiplayer shooter games?

In accordance with the discussion by Trepte and Reinecke (2010), the hero choice will likely be motivated by how effective the hero will be in beating the game (the opposing team). Regarding the research by Ross and Weaver (2012), Harrington (2009) as well as Hughes et al. (2016) the hero choice is also expected to be affected by the presence of other players. This could be seen through players picking heroes that are good for the team, as part of pro-social behavior. According to Lavrakas (2008), preferences are expected to influence the hero choice as well. The hypotheses for the first research questions is therefore the following:
Hypothesis 1: Players will pick heroes they think are more strategic in order to beat the opposing team in the games.

Hypothesis 2: The presence of other players will influence the players’ hero choices.

Hypothesis 3: Player preferences will surface as an influencer in hero choices with players picking heroes they express preferences towards.

2.6.2. What affects the choice of strategy for players when playing heroes?

According to Domínguez et al. (2016) and Harrington (2009), the role of the character influences player behavior. This because players tend to act in accordance with the role of the character and because certain roles have certain available strategies. Domínguez et al. (2016) did their research on a narrative roleplaying game on pre-defined characters. Since heroes are pre-defined characters that players can choose between, it was hypothesized that the Mimesis Effect would be seen with heroes as well. However, the games included in the project was shooter games, not narrative roleplaying games, which could affect the player identification to the characters. However, heroes have their own lore and background stories, which arguably enables a narrative identification in the form of the Mimesis effect.

As well as for the hero choice, the strategy choice is expected to be influenced by other players according to research by Ross and Weaver (2012), Harrington (2009) and Hughes et al. (2016). According to Harrington, for example, players could be more likely to pick a strategy because other players are choosing that strategy (tipping). Furthermore, individual pay-offs described by Harrington (2009) as what makes players evaluate the same set of decisions differently are also expected to surface in the studies. The hypotheses for the second research question are therefore the following:

Hypothesis 4: Players will play the heroes according to their functional as well as narrative roles.

Hypothesis 5: The presence of other players will influence the players’ strategy choices through tipping and/or congestion.

Hypothesis 6: Individual pay-offs will influence the players’ strategy choices by players choosing strategies they personally value.
3. Method

In October 2016, I started an internship at Electronic Arts Digital Illusion CE (EA DICE) in Stockholm. The project was formed throughout this internship, out of personal interest as well as research needs for the company. Questions were added to questionnaires in studies that were conducted at DICE in the beginning of the project. This started the data gathering as well as evaluated the feasibility of the questions. It is important to evaluate the feasibility of questions in questionnaires, because when not asked properly, questionnaires can produce inaccurate or even deceptive results (Goodman, Kuniavsky & Moed, 2012). In order to look at behaviors and strategies of players, studies were conducted on one released and one unreleased game. Multiplayer playtests were conducted with both games, and additional interviews were done regarding the unreleased game. Investigating two different games in two different states gave opportunity to broaden the understanding of how participants understood the design of the heroes and games. In the released game, it was possible to look at the behaviors of the participants compared to the design of the game and the information available of the game and the heroes. In the unreleased game, it was possible to look at the behavior of participants compared to the designer’s intent of the game and hero design. An interview with a designer of the unreleased game provided insights about the game design and the study therefore gave a deeper understanding of the design intent of the heroes. With this information, it was possible to compare the design intent with the behaviors of the participants, to see whether participant acted in the anticipated way with the heroes.

3.1. Multiplayer playtests

The goal of the multiplayer playtests was to collect player behavior both through self-reports in questionnaires and through observation. The studies were conducted as playtests, which is a formative lab method that combines playing a game with answering questionnaires (Pagulayan, Keeker, Wixon, Romero & Fuller, 2012). The reason for conducting playtests was because playtests have a focus on the perception of the participants and are conducted in a controlled and monitored lab environment. Because of playtests’ controlled and limited nature, playtests make it possible to map behaviors to attitudinal data, which Pagulayan et al. (2012) stated is necessary to understand how effectively the game meets the intent of the designers. Therefore, the layout of the studies was that participants played the games and answered questionnaires. The playtests followed the usability method of Open-ended tasks described by Pagulayan et al. as a usability method that gives the participants open-ended tasks in order to observe the participants and how they play. Agreeing with an example of an open-ended task mentioned by Pagulayan et al. the participants were asked to play the game as they would at home, but with a few restrictions on what game mode. This in order to focus on watching the participants and the tactics and strategies they deployed in the game. Restrictions on game modes were made to collect player behavior around the same parts of the game, making the data more focused. Open-ended tasks were used as a usability method because it is useful when the goal is to discover rather than to evaluate. Questionnaires were used both because they are recognized methods to measure player experience (Caroux & Isbister, 2014) as well because questionnaires are used as a usability method to collect attitudinal data regarding self-reported player behavior, gameplay experience, as well as styles and preferences (Pagulayan et al., 2012).

3.1.1. Participants

Since the purpose of the studies was to look at strategies, active screening was used to recruit expert players (Lavrakas, 2008). The criteria for expert players used in the studies was that participants
should play more than five hours of shooter games per week and that the participants should have some sort of previous experience with the games tested. Active screening was used to ensure that the studies would reveal as many strategies as possible used by players, and with the assumption that expert players use more conscious strategies than less experienced players. The assumption was plausible because of Harrington’s (2009) definition of strategies and Schrader and McCreery’s (2008) description of expert player activities coincide. Harrington defined strategies as decision rules for how to play a game, and as problem solving that should be done before playing and Schrader and McCreery wrote that expert players have a high level of understanding of a game and tend to gather information and conduct problem solving before gaming rather than less experienced players that tend to use trial and error during gaming. Accordingly, expert players will more likely report more information about strategies than less experienced players. Furthermore, the definition of expert players by Unsworth, Redich, McMillan, Hambrick, Kane and Engle (2015) as players that play at least five hours per week was used, along with the discussion of Sobczyk, Dobrowolski, Skorko, Michalak and Brzezicka (2015) about consideration of context. Sobczyk et al. discussed the importance of including context when it comes to defining experienced players, in other words what kind of game the players are experts in. For example, a player that plays a lot of racing games but no shooter games, might be an expert in racing games, but would probably not be an expert in shooter games. Therefore, the criteria were that the participants played more than five hours of shooter games and had previous experience of the studied games. The active screening was done through distributing a questionnaire, asking about the number of hours per week participants spent playing different types of games. Participants who fulfilled the criteria for the screening was invited to join the study.

3.1.2. Setup

In the studies participants were playing with and against each other online in the same room. The studies ran on Xbox One consoles and PlayStation 4 consoles. Participants used Xbox One and DUALSHOCK 4 controllers. Video and audio of the participants were recorded, as well as what happened on the participants’ screens. Participants answered all questionnaires digitally on laptops.

3.1.3. Procedure

The playtests combined questionnaires with game play, additionally observations were conducted both during the playtests but mainly after the studies through looking at the recordings from the studies. Following Lavrakas (2008) structure of questionnaires, the questionnaires consisted of three parts; (1) cover letter, (2) instructions, and (3) main body. The cover letter is the introduction to the questionnaire where the study and its purpose are introduced and the introduction explains how the participants are going to answer the questionnaire. After the cover letter and introduction, the questions are presented in the main body of the questionnaire. In order to control that participants had the same amount of time to answer the questionnaires and could start gameplay synchronized, the cover letter and instructions were read to the participants. This gave the participants the information needed before answering the initial questions at the same speed, compared to if the participants would have read this information individually. The initial questions in the main body concerned demographical questions about the participants and their previous experiences with the games. Participants were also tasked with filling in a pre-decided number which served as an anonymous identification for their questionnaires. This according to Lavrakas (2008), that stated that an identification must be included for a questionnaire.

The participants played the games in intervals, completing multiplayer matches. After each match, the participants answered questions regarding the characters that they had played and strategies they had
used. The participants played the games for a total of 90-100 minutes, and answered questionnaires in their own time, therefore there were not a pre-decided set of matches that the participants should have played. The participant played and reported strategies used for as many matches they had time for during the gameplay.

Questionnaires were conducted between each match to make it easier for the participants to remember the strategies they had used, as well as making the task of filling out the questionnaire as unobtrusive as possible (Rubin & Chisnell, 2008). For the sake of helping the participants in answering the questions, aided recognition was included in the questionnaires by having an image of the in-game interfaces or a grid of all available heroes in the questionnaire along the question concerning which heroes the participants had played during the playtest. This to help participants remember which heroes they played during the playtest. Aided recognition can be used when the answer to a question is yes or no, and when the question regards something that has occurred prior to the question, in this case if participants had or had not played a hero (Lavrakas, 2008). The questionnaires also aided participants through branching, which is a way to filter questions so that the participants only need to answer questions that are relevant for them. The participants therefore filled in which heroes they had played and then the questionnaires only displayed questions about the heroes the participants actually had played. Lavrakas (2008) wrote that branching is used in order to not overload the participants' working memories as well as to avoid questions not applicable for the participants. To capture the participants' personal hero preferences, questions were included in the questionnaires asking participants to express their preferences towards each hero. To investigate which strategies the participants used, open-ended questions were included, this not to bias participants with already defined strategies, but to gain insights in what a participant perceived as a strategy in the game. Open-ended questions were defined by Lavrakas as questions without answer categories and these questions tasks the participant with giving an answer in their own words in contrast to close-ended questions that have fixed alternatives to choose between. Close-ended questions are more common in questionnaires since open-ended questions requires bigger cognitive effort from the participants, as well as open-ended questions are harder to control because the participant might not answer in the anticipated way. Furthermore, the accuracy of open-ended, as well as close-ended questions, depends on participants’ perceptions of themselves as well as their willingness to be truthful in the questionnaire (Goodman et al., 2012). Open-ended questions are however suitable when the researcher wants the participants to express their thoughts and perceptions with their own words, which was the case for the studies conducted.

After the total playtime, participants answered questions concerning their behaviors throughout the playtest. This was done through including Hughes et al. (2016) 52 items of behavior (the items can be found in appendix 2). As mentioned in the background chapter, Hughes et al. sought to create a scale to measure behavior in team-based multiplayer online games. In their workshops 52 items were created by participants to describe behaviors in multiplayer online games. These items were divided into eight different dimensions; Trolling, Role Choice, Leadership, Autonomy/cooperation, Teaching, Raging, Enemy Support, and Building Positive Support. Later, Hughes et al. reduced the items to statistically fit to a two-factor scale reflecting constructive (pro-social) and destructive (anti-social) behavior. In this reduction of items four dimensions that surfaced in the workshops were taken away; Role choice, Leadership, Autonomy/cooperation and Enemy Support. The initial scale of 52 items was used, and not the winnowed scale of six items because it was believed that the dimensions Role choice, Leadership and Autonomy/cooperation, that were removed in the winnowed scale, would give useful insights of the participants’ used strategies and their perceptions of the heroes. Furthermore, the
52 items were divided into two sections in the questionnaires, one concerning how participants behaved in the game during the study and one concerning how they usually play. The division was made because 30 of the items included were about communication in online multiplayer games and in the playtests the participant did not have any communication tool available besides the in-game interfaces to communicate. It was decided not to include communication through chat or VoIP in the studies because there was no guarantee that all participants would be comfortable using these functions, or regularly used them when playing at home. It would also have been difficult to process the large amount of additional data this would have given in the scope of the project. The items concerning communication in the scale mostly regarded these types of communication, therefore these items were not applicable for the behaviors specific for playtests. Instead these items were asked with the task for participants to think about how they usually played online multiplayer games, where they might have used these functions.

Observations were conducted during the study as well as afterwards, looking at recordings from the study. The observations were mainly done after the studies, because it was difficult making insightful observations during studies with multiple participants because of the difficulty focusing on one participant. Observing one participant excludes focus from the other participants, and since there is no way of knowing which participant that is going to behave in which way, observations were not focused on individual participants during the studies. The goal of the observations was to find examples of the strategies and behaviors reported from the participants, as well as to confirm participants’ self-reported behaviors. Therefore, it was more useful looking into the videos after having read about the participants’ self-reported strategies and behaviors.

3.1.1. Analysis

To analyze the qualitative data from the open-ended questions of the questionnaire an approach inspired by Grounded Theory was used. The answers were coded with open coding and axial coding. Open coding is defined by Howitt (2013) as when each line or paragraph is scrutinized for its meaning. Open coding should be done as close to the original data as possible, without preconceptions. The open-ended questions regarding strategies were further analyzed with axial coding to see which answers that related to each other in order to form the categories of strategies the participants had used. Howitt characterized axial coding as organization of the initial codes with the purpose of identifying key concepts. In addition to the coding, the axial codes were scored based on the frequency of the codes. The frequency scoring was done in order to see which strategies that had been used several times and by several participants.

The questions regarding behavior and strategies encouraged participants to give examples from the matches they had played to describe the strategies and behaviors further. When possible the answers to these questions were used as references to situations in the matches where a strategy or behavior could be observed. This in order to find insightful observations from the big amount of video materials that was available from the studies (90-100 minutes per participant). During the studies notes were also made if a useful observation was made. The observations of strategies and player behaviors were then written down and complemented with screenshots and/or video to get rich descriptions of the observations.

The selection of heroes from the games that were considered in the result were limited to six heroes per game. The subset criteria for which heroes to analyze from the released game were the most
played heroes of every role and two other relatively popular heroes. For the unreleased game, the
criteria concerned the heroes with most impact for the development process.

The 52 items of behavior were categorized according to their dimensions as well as the behavior they
described. Hughes et al. (2016) divided the winnowed items into two different categories of behaviors;
destructive and constructive. These categories were still used along with other categories describing
the other items. In these categories, the mean of the numbers of the items included was calculated to
describe the frequency of this category of behavior. Furthermore, the items were divided in two
sections, producing a frequency of the behaviors specific for the playtest and a frequency of the
behaviors concerning communication.

To be able to compare strategies with behavior, each strategy was described with the key concepts
taken forward from the axial coding for each participant. This resulted with a list per participant with
the frequencies of self-reported behaviors and strategies. To support these results some of the
strategies were strengthened with screen shots or video clips of the behavior.

The behaviors of the participants were strengthened with data about which heroes the participants
reported personal preferences towards, which heroes the participants played and which roles the
participants played the most.

To analyze the impact of game design in the behaviors of participants, the behaviors were compared to
the design intent and roles of the heroes. Design elements presented to the participants in the games
were examined, and an additional review of other multiplayer shooter games was made to create a list
of design elements typically present in character select screens in these types of games. Design
opportunities deriving from the player behavior of the participants and the review of design elements
was discussed.

3.2. Interviews

The goal of the interviews was to collect in-depth information about behavior and strategies through
observing and interviewing participants during gameplay. The study followed the usability method
Open-ended tasks, as the purpose was to examine which strategies and tactics participants used when
they played (Pagulayan et al., 2012). The participants were observed and interviewed one at a time as
they played the game, this in order to ask about observed behavior while it occurred. Interviews were
conducted because according to Goodman et al. (2012) interviews are necessary to get a deeper
understanding of the user experience of a participant.

3.2.1. Participants

Four participants were observed and interviewed. The criteria for the participants were the same as for
the multiplayer studies. Furthermore, the participants chosen for the interviews were the participants
with high self-reported familiarity and experience with the game.

3.2.2. Procedure

The participants were interviewed for 20 minutes each. The participants were seated far from each
other in order to make the interviews as unobtrusive to the other participants as possible. During the
interviews, the participants were asked to think aloud. Think aloud is when a participant verbalizes
what they are thinking during a usability test session (Rubin & Chisnell, 2008). Rubin and Chisnell
wrote that letting a participant think aloud during a usability test can reveal clues about the
participant's perception of the system being tested. The interviews were semi-structured with a few pre-constructed questions regarding the heroes the participant chose and the strategies the participant used. A semi-structured interview was used together with think aloud to get an understanding of the participants’ perception of the choices they made in the game. With these methods, the interviews could be treated as open discussions lead by the participants (Benyon, 2010; Lavrakas, 2008).

3.2.3. Analysis

For the interviews and observations, a document was prepared for each participant with fields regarding the strategies and heroes the participants used as well as fields for explanations and observations of these strategies and choices. The notes were during the study divided into these fields. When something was observed that was of interest to look up later in the video material, the time was noted down to help go through the data after the study.

The notes from the interviews were then coded with open coding and axial coding to categorize the strategies and behaviors observed. If the notes written down were lacking information, the video material was visited to further describe the observed behavior before coding it. Parts of the interviews were transcribed for the presentation of the result.

3.3. Ethics

When presenting quotes from the qualitative questions in the questionnaire, the spelling will not be corrected, the quote will be taken as it was written by the participant. This to avoid changing the initial meaning of the comment. Quotes presented from the interviews are transcribed by the author. In all quotes shown in the report, the names of the heroes and games have been taken away in accordance with the reasons mentioned in the limitations section in the introduction chapter of this report.
4. Result and analysis

This chapter will present the result of the studies together with an analysis of the result. First, the demographics of the participants will be presented, followed by a list of design elements found in the games studied and design review. Thereafter the result will be presented with discussion around player needs and the design opportunities derived from the player needs. Furthermore, design elements that can be included in game design to meet the player needs will also be discussed.

4.1. Demographics and previous experience

For the studies, a total of 43 participants were included, all male. The participants were between the ages 18 and 39 (M = 23.42, SD = 5.23). The participants reported that they typically played between 5 and 40 hours of video games per week (M = 22.95, SD = 8.60). Five participants reported playing between 1 to 5 hours of shooter games per week and 38 participants reported playing over 5 hours of shooter games per week, fulfilling the criteria from the active screening. The 5 participants that reported playing between 1 and 5 hours of shooter games per week reported playing 5, 7, 14, 20 respectively 24 hours of video games per week.

Together with the criteria of playing over five hours of shooter games per week, the participants invited were participants that had reported having some sort of familiarity and previous experience with the games tested. The familiarity did not necessarily originate from playing the game, but also from looking at others play the game or reading and hearing about the games online and other forums.

4.2. Design elements

The games included in this project had different designs, and contained different design elements. Therefore, the different games provided the participants with different kinds and amount of information to base their hero and strategy choices on. In the hero select screens in the games studied, the following design elements were found:

1. Display of character with main weapon type
2. Role/class/type of character
3. Tips/suggestions on gameplay

To further discuss design opportunities from the player behaviors, an extended review of design elements was made on different multiplayer shooter games. The review can be found in appendix 3, and the result of the review added four other design elements present in character select screens in different multiplayer shooter games:

4. Description of character
5. Stats of character
6. Abilities and/or skills of character
7. Video tutorial of how to play character
4.3. **RQ 1: What affects hero choice in multiplayer shooter games?**

It was found that participants were influenced by five different aspects in their choice of hero in the games. These aspects were (1) Familiarity with hero and game, (2) Preferred strategy, (3) Expectations of hero, (4) Personal hero preferences, and (5) External factors. All aspects will be presented and evaluated below.

4.3.1. **Familiarity with hero and game influenced hero choice**

For the studies active screening was done, as mentioned in the method chapter. Participants invited reported to have some sort of experience or familiarity with the games being tested. However, the level of experience, or familiarity, of the games differentiated between the participants, as well as the origin of the familiarity. Beyond playing the games, the familiarity originated from the franchises, watching other people play the games and prequels, and hearing and reading about the games and prequels on internet forums. The participants reported being slightly familiar to extremely familiar with the games. The screening was done in order to ensure that the participants would be able to use and report strategies during the studies. However, it arose in the studies that some participants were affected by their low familiarity of the games and the heroes when it came to hero choices. During the interviews, familiarity with the game surfaced as a major influencer of the hero choices because all of the participants at some point during the interview stated that they were not familiar with a hero, and therefore did not have any particular reason for choosing that hero. Many of the answers for why the participants chose a hero were in the style of “I do not know, felt like trying the hero”. This also arose in qualitative data, exemplified with the quote below.

> “How they looked. Since im new to this i dindt know any abilities” – Participant about familiarity influencing hero choice.

Furthermore, another phenomenon was observed in the hero choices of participants less familiar with the games. In the studies, participants were asked what they liked doing the most in the games. It was found that 63% of the least familiar (slightly familiar with the game) participants answered playing defensively or supportively. As comparison, this was mentioned by 33% of the somewhat familiar participants and by 25% of the mostly to extremely familiar participants. To investigate further if there was a trend for less familiar participants to prefer and choose defense and support heroes, a comparison in hero role choices was made between the familiarity groups of participants. The following graphs show these distributions of the roles of the played and preferred heroes between the different familiarity groups.
The slightly familiar and somewhat familiar participants accounted for 81% of all participants in the study, therefore the last two groups are represented together in the graphs. The first graph shows that 51% of the played heroes were defense and support heroes for slightly familiar participants, 42% for somewhat familiar participants and 30% for mostly to extremely familiar participants. The second graph shows that 51% of the preferred heroes were defense and support heroes for slightly familiar participants, 39% for somewhat familiar participants and 32% for mostly to extremely familiar participants. The small difference of which heroes the participants have chosen and preferred suggests that less familiar participants preferred choosing defense and support heroes, which also was supported by qualitative data, see quotes below.

“I preferred supporting my team, either healing or blocking damage, it was the easiest way to feel like i made a difference.” – Participant slightly familiar with the game describing strategies used.
“Healing is much more easier and fun in this game. You can actually be strategic and do something rather than shooting randomly.” Participant slightly familiar with the game describing strategies used.

“Tried playing as a healer which was more forgiving and most players who play regularly would play them, did very good, healing was a good start to keep the tempo down and allow me to analyze the game and see who needed my help the most.” Participant slightly familiar with the game describing strategies used.

This result presents a need for players when being presented with a new game and new characters. Players need to be presented with the necessary tools to get to know a game as well as the characters in it. This so the players feel they can make meaningful decisions in a game at an early stage. This could be done by intriguing players in the hero choice stage so they want to get to know more about the heroes by including the design elements display of the hero with the main weapon type and description of the hero. Furthermore, this can be done by providing players with information so they will know how the heroes will play by including the design elements information about role/class/type, stats, abilities/skills, tips on gameplay or video tutorials. Furthermore, if a certain role or type of character is easier for beginners, this should be communicated by game design.

4.3.2. Preferred strategy influenced hero choice

Participants expressed choosing heroes after what playstyle or strategy they preferred to play in the games, examples of quotes strengthening this can be seen below. Since the different heroes had different roles in the games, participants that preferred a certain way of playing, chose a hero that suited that playstyle. To be able to make this choice, participants were assisted by their familiarity with the heroes and games, the information present about the heroes in the games (design elements) and information present about the heroes on other medias.

“i choose the character i think fits my playstyle, not a character that only heals and not a character that has too many abilities” – Participant about their choice of hero.

“Probably like characters in which I could keep a little distance but still shoot alot.” – Participant about their choice of hero.

Several participants explicitly reported preferring certain playstyles, and their hero choices agreed with these preferred playstyles. This indicates that the need for participants to find a hero that fits their preferred playstyle was met by the designs of the studied games. In the studied games, this was done by including the design element role/class/type of the hero and by including the design element display of hero with main weapon type. This so the participant would know what to expect of the gameplay of the hero. The following participants’ behaviors illustrates this finding. One participant that reported preferring an aggressive playstyle mainly used heroes that allowed for an aggressive approach (six out of nine played heroes). Another participant expressed their preferred playstyle as defensive and only played defense and support heroes. The strategies mentioned used by this participant were defensive and supportive strategies. Yet another participant that reported mainly using ambusher strategies mainly picked ranged heroes that had guns. This participant explained that the participant mostly played alone, if the team were not gathered. It therefore appeared that this participant chose heroes with guns in order to be effective alone by flanking enemies from far range. Hence, the self-reported behaviors of these participants agreed with the observed behaviors of hero choices of the participants.
When participants already had chosen a strategy to play, participants needed to find heroes that made the chosen strategy successful in the game. This highlights a need for players in these types of games, namely that the games need to provide the player with enough information to be able to determine if the hero will suit the preferred strategy. From this, design opportunity arises. Knowing that players can come into the game with an already decided strategy, the game needs to guide the player to the character that will fit this strategy. The result indicates that this can be achieved by including the design element role/class/type of the hero, or display of the hero with main weapon type, because participants mentioned consulting this information in their choices. Furthermore, the design elements tips on gameplay, stats, abilities/skills and video tutorial of how to play character would also give the players information about the gameplay of the hero.

### 4.3.3. Expectations of the heroes influenced hero choice

In the studies, it was shown that expected abilities and roles of the heroes influenced hero choice when the participant had not played the hero before. This happened because the familiarity of the heroes did not only originate from playing them. Participants in other ways familiar with the franchise and its characters formed expectations of how the characters would play, and that influenced some of the participants’ choices during the studies as is exemplified with the quote below. The expectations were often driven by which strategies the participants expected the heroes to be able to play, and therefore this result is also strategy related. During the interviews participants expressed that the heroes played like the participants had expected them to play, compared to their experience of the heroes from the franchise.

“I chose him ‘cause I think he will have a missile, gonna have a jetpack and he’ll be like jump very high... That’s a bit of an advantage” – Participant’s answer when asked why the participant chose a hero.

Furthermore, presenting players with information about the role or type of the hero will form expectations for the players. When telling players that a hero is an offensive hero, expectations will be formed about the gameplay of this hero, if the player have not played the hero before. This additionally, can influence the hero choice for the player. The quotes below serves to show that participants formed expectations from the roles of the heroes.

“I played as [hero]. I felt that his roll was already decided before i got into the fight [...]” – Participant about strategies during the first round of gameplay.

“I thought [hero] was a healer but apparently [hero] uses shields to lock down areas and a teleporter to allow your teammates to get from spawn quicker [...]” – Participant about abilities of hero not meeting expectations.

“[Hero] was a tank and made to protect the teamates.” – Participant about hero.

“[…] if I chose an aggressive character, then I would have to be aggressive when playing.” – Participant about how the strategy was affected by hero role.

This results ties to the result shown about familiarity because it shows again that familiarity influenced the choices and behaviors of participants even if this familiarity did not originate from having played the games before. Being already familiar with a character from other sources than having played it, will form expectations on how this character will play. A lesson to learn from this, is the necessity to consider these expectations and their origin when both designing characters as well as presenting
them. To form expectations, or meet them, is a way to give clues to the player about how a character will work in a game. If players have accurate expectations of how a character will play, they will come in with knowledge about the character and the game, without having played the character before. Participants mentioned during the studies that characters played as they expected them to play, which indicates that the game designs successfully communicated the intent of heroes and met the participants expectations through the design element display of hero with main weapon type.

The stats and abilities of the heroes, or expectations of these for the heroes surfaced as an influencer when it came to hero choices for participants that already had formed an idea of how they wanted to play in the game. In this sense, this aspect relates to the influencer preferred strategy as mentioned above, and again highlights the need to be familiar with a hero in order to make decisions regarding it. The familiarity however, not necessarily originating from having played the game before. Including design elements conveying information about stats and abilities/skills would also help the players make their decision, since knowledge and expectations of these surfaced as influencers when it came to the hero choice.

4.3.4. Personal hero preferences influenced hero choice

In games with a variety of characters to choose from, it is expected that players will find characters they prefer to play that matches their preferred playstyle. In the studies participants reported which heroes they had personal preferences towards. This was compared to the heroes the participants played during the studies. Of all times heroes were played by participants during the studies, 70.5% of these times it was with heroes the participants had expressed personal preferences towards. On an average, participants preferred 6.6 heroes each and played 9.9 heroes each during the studies. Hence, heroes the participants preferred were played more often than the other heroes in the studies. This was also shown in the qualitative data, the quotes below are examples of comments made about preferences from the studies.

"i choses the character i like the most and it made me play more of a backrange damagedealer trying to be carefull but alot of the time getting inpatient and going in.” - Participant about what affected hero choice.

“I choose [hero] ‘cause I like him the most right now, I like the playstyle of him” – Participant when asked why the participant chose hero.

“’Cause you can... And he is pretty cool, like him from the movies, so, I want to try him out.” – Participant when asked why the participant chose hero.

It was shown that personal preferences of heroes influenced hero choice, whether the preferences originated from the game or the franchise, in other words knowledge about the heroes originating from other sources than playing them. Continuing the discussion in the section about expectations, participants expressed that preferences for the characters that originated from the franchises outside of playing the games influenced their decisions. This as participants mentioned preferring heroes because of what they knew of the hero from other medias. The preferences towards the heroes arose from different aspects concerning the heroes. Participants mentioned abilities, mobility or movements, stats, the coolness or level of fun, weapon or gadgets, playstyle and how easy it was to play the hero as reasons for their preferences. Abilities, mobility or movement, weapons or gadgets, stats and playstyle all concerns what the participant could do with the hero, and these were the main reasons behind participants preferences. But other aspects of the heroes such as the coolness and level of fun of the
hero were also origins of preferences. That a participant considered a hero cool did not necessarily concern the way the hero played, but just the hero generally as a character. Consider the last quote above, this participant talks about the hero being cool and is basing this on familiarity of the hero from other media. This positive attitude or preference towards the hero has nothing to do with the functionality or playstyle of the hero. That participants preferred heroes that were easy to play is connected to the result shown in the aspect of familiarity, were it was shown that participants unfamiliar with the game preferred and played certain hero roles more often. These results also tie back into the result concerning preferred strategy, since participants often preferred heroes because the playstyle of the heroes agreed with their preferred strategy, however, there were other aspects regarding hero preferences that influenced the hero choice. As is shown by the first quote above in this section, participants also picked heroes because of their preferences towards them and after that adapted their playstyles. This serves to show that not all preferences were strategy related.

The hypothesis that preferred heroes would be played more often than other heroes was strengthened by the studies conducted. Players will form preferences towards characters, both from playing a game and through other means interacting with the franchise of a game. If a player has a preferred hero, and that hero is not available to pick, one way to acknowledge this is to provide the player with alternatives that makes sense from the player preferences. Another way this preference can be acknowledged through game design is to make it possible to customize or in some way further work with the preferred character. Furthermore, the result mentioned so far shows a connection between the different results, namely preferences of strategies. These steered both hero choices as well as attitudes and preferences towards the heroes.

4.3.5. **External factors influencing hero choice**

Because of the different designs of the tested games, game design specific factors influencing the participants’ hero choices surfaced. The games used different game designs, including a design with the intent of influencing the hero choices of participants by including the design elements tips on gameplay, and a design focusing on the hero persona, forming expectations and understanding about the gameplay of the character by focusing on the display of the hero with the main weapon type. The tips on gameplay concerned advices on which hero to choose to achieve team balance. It was shown during the study that these game designs did in fact influence the decisions the participants made. Another aspect worth mentioning when talking about external factors is the influence of other players. Both game designs and other players are external of the participants, in the sense that the aspects do not originate from the perceptions, knowledge or feeling of the participant. In this section both game design as influencers as well as other players as influencers will be discussed and analyzed.

Already mentioned in the expectations section of this chapter, a game design in the games concerned focusing on the already existing personas and lore of the heroes, forming an understanding of the hero as a character from the lore. This persona formed expectations in participants of how to play this hero, and thereby influenced the hero choices of the participants. Participants mentioned choosing heroes because they knew the persona of the heroes from other medias, thereafter confirming the hero played as they thought, indicating that the design intent of elaborating on the hero persona was communicated through the game design.

In relation to the design including tips on team balance, some participants reported that they adapted their hero choices in order to play what was needed for the team in terms of balance, but also what was needed to counter the composition of the enemy team, as exemplified by the quotes below.
“Played more careful due to being relegated to healer roles most games, almost nobody played healers.” - Participant about what influenced hero choice.

"It all depended on the situation of the match and the other team member’s composition. I chose whatever it was needed.” - Participant about what influenced hero choice.

"Team lacked both tank and healer, luckily enemy team lacked healer so by choosing healer I was able to keep my team alive to capture the zone.” - Participant about what influenced hero choice.

“I started off as [hero] but my team’s healer left so i decided to take that spot […]” – Participant about what influenced hero choice.

These quotes, and the phenomenon that participants chose heroes that were good for the team, strengthen the hypothesis that players would choose a hero that was effective in the game. These participants adjusted their hero choices so that the team would benefit, and thus be more effective in the game. This also emphasis the social aspect, where other players influence the choices of a player. For example, when looking at the first quote above, the participant explains that the participant chose a type of hero because the other members in the team had not chosen this type of hero and therefore it was a more strategic move for the team. This indicates that the choice would have been different if the other players had behaved differently. That a participant used strategies, or in this case chose hero types or roles that other players did not choose is also an example of congestion. This happened because if participants would all have chosen the same type or role of hero, the game would have become imbalanced and therefore the team would have had a smaller chance of beating the opposite team. The game design of including tips of team balance also probed for congestion, as it told players to make choices that were dissimilar from teammates choices.

What became apparent is that the design of the game, in terms of what information the game provided, influenced the decisions of participants. Providing players with information and tips on how to choose characters, the game teaches the player how to treat this decision. In the studied games, a design provided tips on gameplay in-game that emphasized the importance of team balance and as became apparent, this was intercepted by several participants. All the design opportunities discussed in this chapter comes down to this, the result showing that the game design influences the participants.

4.4. **RQ2: What affects strategy choice in multiplayer games?**

The strategies and tactics reported being used by participants in the studies were categorized into five different types of strategies. The categories are presented below, each with a short description:

1. **Offensive strategies**: strategies focused on straight on attacking, often aggressively charging into close quarter combat.

2. **In-and-out strategies**: strategies using a combination of charging into close quarter combat to attack, retreat to cover and then repeat.

3. **Defensive strategies**: strategies involving influencing the game while out of harm’s way by keeping distance, such as sniping or staying behind cover of obstacles or teammates.

4. **Supportive strategies**: strategies regarding providing support for teammates with cover, healing, boosts or damage dealing.
5. **Ambusher strategies**: strategies regarding ambuscade attacks such as flanking, setting traps and attacking enemies from behind.

A full tactic played by a participant could consist of multiple of these categories.

Four different aspects affecting the strategy choice surfaced in the studies; (1) Familiarity with hero and game, (2) Hero role and abilities, (3) Preferred strategy, and (4) Behavior of other players. The aspects are going to be presented and evaluated below.

**4.4.1. Familiarity with hero and game influenced strategy choice**

As was the case with choice of hero, familiarity with the hero and the game also influenced choice of strategy for the participants, as well as incused the other aspects that surfaced as influencers. Participants mentioned the need of getting to know the game and the heroes in it in order to use the heroes effectively in the game. This result can be illustrated with the qualitative answers from a participant during the studies, shown below.

“no strategy once i survived for 10 seconds without dying” – Participant when asked about used strategies for the first round of gameplay.

“None trying to survive maybe getting a kill” – Same participant as quote above when asked about used strategies for the second round of gameplay.

“Got to know the buttons now at least enough to create a bit damage” – Same participant as above when asked about used strategies for the third round of gameplay.

“Just tried to learn the controllers and flying around a bit hide a bit and then try not to get myself killed” – Same participant as above when asked about used strategies for the fourth round of gameplay.

The quotes above were written by a participant when asked about successful strategies used during the different rounds of the multiplayer playtest studies. As can be seen, the participant did not mention specific strategies, but instead indicated that the focus was to try the controllers and try to survive. This participant reported playing over five hours of shooter games per week, and typically played 22 hours of video games per week. The same phenomenon surfaced for other participants as well, another example is shown below.

“Have not played the game before so felt confusing as to what I was supposed to do, Tried playing some form of Tech character with turrets but died very quickly, match ended very fast in a loss, i noticed too late that the team was not using a good mix of champions.” – Participant about used strategies in the first match.

“Tried playing as a healer which was more forgiving and most players who play regularly would play them, did very good, healing was a good start to keep the tempo down and allow me to analyze the game and see who needed my help the most.” – Same participant as quote above about used strategies in the second match.

The quotes above were reported by a participant that had not played the game before the study, that played more than five hours of shooter games per week and played a total of 20 hours of video games per week. What can be seen in the quotes are that the participant was learning the game while playing. The first quote displays the uncertainty of how to play, while the second quote shows that the
participant spent time analyzing the game. The rounds following these, the participant reported an understanding of the game, as can be seen in the quote below.

“Team lacked a tank, was able to save the last round with [hero] by providing someone for all the squishy characters to hide behind” – Same participants as quotes above about used strategies in the sixth match.

The quote above hints that the participant understood the need for team balance in the game, by adjusting choices to benefit the team as well as to be successful.

This phenomenon also surfaced in the interviews during the studies, where participants reported improvising in their strategies, since they did not know enough about the map or the game. One participant reporting usually playing a flanking tactic reported the need of getting to know a map to be able to utilize that tactic. Participants being interviewed also mentioned just charging into battle, pressing buttons because their lack of familiarity with the game and the heroes.

The participants also showed awareness of the fact that they were influenced by their familiarity of the heroes and games, several participants stated that there is a need to learn the games and get to know the heroes in them to be able to play the games effectively, in other words, to strategize in them. The quotes below serve to show how participant acknowledged this fact.

“[…] you need to learn and getting used to the character in order to be succesful in the game. [...]”
– Participant about familiarity influencing gameplay.

“every hero gave a different combat experience, I had to figure out what the hero was good at and then adapt my gameplay to that” – Participant about familiarity influencing gameplay.

“[…] I had to learn the character to better understand how i should play the game.” – Participant about familiarity influencing gameplay.

This result again highlights the need for players to be presented with information about how to play a game when the familiarity with the game and heroes is low, as discussed concerning how familiarity influenced hero choice earlier in this chapter.

4.4.2. **Hero role and abilities influenced strategy choice**

Because of the different designs of the heroes in their roles as well as abilities, it was no surprise participants mentioned the role as well as other distinctions between the heroes to be influencers of their choices regarding strategies. This due to the fact that the heroes were different and could not be played in the same ways.

One of the distinctions between the heroes participants mentioned influenced their strategy choice was the role of the hero. The quotes below show how participants recognized the role of the hero to be one of the main motivations behind chosen strategies.

“[…] choosing a support character obviously makes one unable to play as assault/tank class.” - Participant about how hero choice affected strategies.

"All characters in the same roles are fundamentally the same. [...] Changing a character in the same role doesn’t change anything. [...]” - Participant about how the strategy was affected by hero role.
“It changed my entire playstyle because the heros are divided into classes.” – Participant about how the strategy was affected by hero role.

“All characters had their own preferred playstyle to play as. So if I chose an aggressive character, then I would have to be aggressive when playing.” – Participant about how the strategy was affected by hero role.

The strategy choice was affected in the sense that participants expressed playing the roles to their strengths and abilities. One of the participants expressed playing the roles to what they were made for, quote can be seen below. This indicates that the game successfully communicated the intent of the heroes.

”Trying to play to their strengths, Tanks as a tank, healer as support, Attackers as Aggressive players etc.” - Participant about used strategies.

“I knew both of the characters advantages and disadvantages so I played accordingly [...]” – Participant about used strategies.

“If I used an offensive character I attacked more and with the defensive I stayed back more and attacked from a distance or set traps, so I used the characters for "what they were made for", a lot due to their abilities which fitted that way the best.” – Participant about role affecting strategy.

Another distinction between heroes mentioned being an influencer of strategy choice was the distinction between hero range. Similar to the role, this distinction was based on the abilities and weapons of the heroes.

“There's a great difference in game style whether you play as a ranged hero or close combat hero. If you go melee you are going war more aggressive than if you were going mid-ranged to long range.” – Participant about how the different types of heroes affect strategy.

“Generally speaking the biggest difference was range or melee, either being more defensive and using long range tactical approach or straight up manfighting and creating chaos or trying to sneak around. [...]” – Participant about the different types of heroes.

Both mentioned distinctions were based on the stats, abilities and weapons of the heroes. Participants mentioned that the specific hero they chose affected the strategy they used, this with the same reasons as the distinctions affected their decisions – the heroes had different stats and abilities, strengths and weaknesses. Thereby the hypothesis that participants would adopt their strategies to the role of the hero were strengthened by the studies.

Participants were asked which strategies they used that were most successful with each hero, below is the resulting hero types found in the studies. From the 12 different heroes included in the analysis, 10 different types of heroes were found based on the strategies the participant found effective with each hero. The hero types differ from being effective with two categories of strategies up to four categories of strategies. The hero types that fit more than one hero is marked with a (2) in the graph.
Participants used offensive strategies successfully with 60% of the hero types, in-and-out strategies with 50%, defensive strategies with 50%, supportive strategies with 60%, and ambusher strategies with 70% of the hero types. Table 1 shows the type of heroes that surfaced from the used successful strategies with each hero. Hero type 1 was effective with offensive, in-and-out, supportive and ambusher strategies, while hero type 3 was effective with defensive and ambusher strategies. This means that hero type 1 had abilities that allowed for more successful strategies than hero type 3.

The successful strategies used with the heroes, agreed to the role and descriptions of the heroes. Highlighting the finding that participants played the heroes according to their role and personas, as hypothesized in the background chapter.

### 4.4.3. Preferred strategy influenced strategy choice

As was the case with hero choice, preferences also influenced strategy choice. This in the sense that participants also had preferred strategies.

*I felt that I usually played flanking mode and that worked on almost all of the characters [...]* – Participant about strategy choice.

Above is a quote from a participant that during the study applied ambusher strategies in the form of flanking the opponent, with every hero the participant played. The same participant was interviewed and explained that when playing these types of games, the participant usually used flanking as a strategy. The participant therefore used the strategy the participant preferred to play in shooter games in the study.
“The best strategy was to play offensive and taking your team forward. The healing skill was helped our team a lot during our success on the map. I also think the healing skill helped the team to stick together.” – Participant describing a strategy used belonging to the categories offensive strategies and supportive strategies.

“The best strategy for [hero] was to play a more defensive game by using the turret skill behind my team mates. I did a lot of damage but wasurnable because I was stationary. The team helped me out by placing shields in front of me for protection.” – Participant describing a strategy used belonging to the categories defensive strategies and supportive strategies.

“Staying a little behind your team, throwing the shield up in front of your team mates and boosting them at front line when ultimate is ready.” – Participant describing a strategy used belonging to the categories defensive strategies and supportive strategies.

“Staying close to your team mates healing and boosting damage. Never go alone and use the gun only if needed and you don’t have a team mate close to heal.” – Participant describing a strategy used belonging to the categories defensive strategies and supportive strategies.

The quotes above was stated by a participant that reported preferences towards supportive strategies and playing together with the team. As shown, the participant kept playing supportive strategies with all heroes during the study. The participant also mainly chose to play defensive strategies during the study.

Another participant explained different strategies that would be successful for one of the heroes and expressed that one successful strategy would be to keep far range and play more defensively. This participant played the hero close to the team and therefore closer to combat, this because other teammates were gathering and the participant expressed preferring to play together with the team. This participant explicitly reported that the participant played a certain way because of preferences, although there were other successful strategies suitable for the hero.

The mentioned result exemplified how preferences towards strategies surfaced as an influencer, even though participants were not asked about preferences towards different strategies. Examples were also found where participants deployed preferred strategies and it was found it was not the most strategic way to go, this is shown by the quote below.

“I like to play aggressively so when I chose characters like [defense hero] I usually got destroyed but with [offensive hero] I could survive more cheeky flanks. But of course choosing someone like [supportive hero] makes you back up a lot and heal tanks” – Participant about used strategies with specific heroes.

This result aligns with the hypothesis that participants would choose strategy depending on individual pay-offs. These individual pay-offs being affected by the participants’ personal preferences towards different strategies. Again, this highlights the need for players in the sense of providing players with information about how the heroes play in the game, so the decision of character will match the preferred strategy.

4.4.4. Behavior of other players influenced strategy choice

Since participants were playing and competing with other participants and players, participants reported being affected by the decisions of other players. This mostly regarded whether participants
chose to play cooperative or autonomous during the studies. It also related to the influencer external factors, mentioned regarding hero choice. Since participants adjusted their choice of hero to maintain balance in their team, they also adjusted the strategies to play in the game, for example.

One participant explained during the interviews that if the participant saw teammates gathering during the study, the participant joined them and played cooperatively, although the participant expressed preferring to play autonomously. This is an example of the force tipping, in other words the tendency for a player to choose a strategy because other players are playing that strategy. Supportive strategies are a good example of tipping as the more players that work together the better. Another example of this was seen in the behavior of a participant that described strategies used with a hero and that explained two different options used, seen in the quotes below.

“Linger in the bakround, waiting to strike” – Participant describing used strategy with a hero.

“to attack the enemy in group, his spin attack was very usefull if you want to avoid blaster fire while getting some kills at the same time” – Same participant as above describing another used strategy for the same hero.

The first quote describes a defensive strategy, to keep in the background and wait for the right moment to strike, while the other quote describes an offensive strategy, to attack together with the team. Here it also became clear that when the participant was surrounded by the team, the participant behaved in another way then when the participant was not in the presence of teammates. The same can be seen in the quote below. The quote indicates that because of the help from teammates, the participant was able to play in a certain way because of the protection of teammates.

“The best strategy for [hero] was to play a more defensive game by using the turret skill behind my team mates. I did a lot of damage but was vurnable because I was stationary. The team helped me out by placing shields in front of me for protection.” – Participant describing successful strategy.

As was the case with strategies changing because the behavior of teammates, the behavior of the opposing team also influenced how participants played.

“to go above ground on a building and shoot grenades or blaster shoots from the roof. very useful if the enemy team is gatherd as a group” – Participant describing used strategy.

The quote above mentions that when the opposing team was gathered as a group, the described strategy was useful. This hints that if the opposing team had not been gathered, the strategy would not have been as useful and that may have influenced the participant to choose another strategy.

This result strengthens the hypothesis that participants would be affected by other players in their behaviors when making decisions about strategies. This is also where the difference is between single player and multiplayer games, although theories found from research on single player games were seen in multiplayer games as well, the behavior of other players also needs to be accounted for in multiplayer games.
4.5. **RQ 3: How is hero and strategy choice related in multiplayer games?**

When looking at the different aspects influencing the participants’ hero and strategy choices, it was found that participants either decided which hero to play as first, or which strategy to use first. This made the basis for further choices, and there were reasons for why the participant either chose the hero first, or the strategy first. The image above illustrates the decision paths found, and what influenced the decisions in these paths. Influencers are the boxes outlined in green, blue and yellow. The green influencers are influencers that is dependent on design of the hero and game, the blue are the influencers that is dependent on the participants and their player behaviors and the yellow are influencers dependent on other players. The influencers in the image are the ones already discussed earlier in this chapter. Both paths lead to either a successful or unsuccessful outcome, in other words, in a successfully or unsuccessfully used strategy. A successfully used strategy being a strategy where the participant used the strategy and succeeded with the intended outcome, for example killed a number of enemies before getting killed, and an unsuccessfully used strategy being where the participant got killed without being able to succeed with the intended outcome.

The first path, the one to the left in image 1, concerns when players first choose a hero and thereafter adjust their strategy to that hero. To exemplify how a player can go through this path, a participant is used. A quote from the participant is shown below.

“i chosed the character i like the most and it made me play more of a backrange damagedealer trying to be carefull but alot of the time getting inpatient and going in.”
This participant reported choosing a hero that the participant liked and then that the participant had to adjust the strategies to this hero. So, looking in step 1 in image 1, the participant was influenced by preferences in the initial choice of choosing hero. Going into step 2, the participant was then influenced by the design of the hero in the game, in other words the role and abilities of the hero. From the quote, it is hinted that the participant understood that playing more ranged and careful with the hero was effective, and therefore played this way. But, the participant also reported getting impatient and changing strategy to a more offensive one. The participant reported preferring more offensive heroes during the study and also used more offensive strategies during the study. It is therefore plausible that the participant preferred more offensive strategies, which would in that case explain why the participant decided to change to a more offensive strategy. In this sense, the participant was also influenced by preferences in the second step.

To exemplify the second path, a participant from the interviews will be discussed. This participant expressed flanking as the participant’s preferred strategy. The participant did this by explaining that the participant usually played with this strategy in these types of games and used this strategy with all chosen heroes during the study. So, this participant joined the game with the intent of playing with a flanking strategy, and therefore is in the second path to the right in image 1. In this case, both of the influencers in the first step is affecting the participant. The participant has familiarity of these types of games and strategies to use in them, and has preference towards a certain strategy. During the interview, the participant kept choosing ranged heroes with guns and explicitly reported choosing heroes because they had a gun as their main weapon. In this sense, the participant was affected by the design of the hero in the game, more specifically what kind of weapon the hero had.

The outcomes for the decisions, whether the participant starts with hero choice or strategy choice were that the strategies used together with the heroes proved successful or unsuccessful. From this outcome, the participants based their next decisions. Some participants mentioned choosing the same hero, if the strategies used with the hero proved successful for example.

It was seen in the results from the studies that there was a difference in strategies applicable to heroes depending on if the hero was a melee or ranged character for example. In this sense, the decision of strategy was very much dependent on the choice of hero, if the participant made the choice of hero before the choice of strategy.

With this knowledge of the paths participants took and what lied behind these decisions, the design opportunities mentioned in this chapter can be revisited. What the paths shows, is that participants came into the games with different sequences of choices, and therefore different needs. On one hand, there were participants joining the game, choosing a hero and thereafter adapting the strategy to that hero, and on the other hand there were participants coming in with a strategy already in mind, trying to find a hero that would fit that strategy.

Considering the players joining the game and choosing a hero first, catering for the needs of these players would be to design for the character first. Designing for character first being comparable to designing for the Mimesis Effect, by making clear for the player what kind of character a hero is and through that form the player behavior with that character. As discussed earlier, game designs studied included designs focused on the personas of the heroes, communicating the personality of the character. By giving players an idea of who a character is will also give the players an idea of how this character can be played, as shown by expectations influencing player decisions. Design elements that have been used by different multiplayer shooter and battle arena games to convey this type of
information is to (1) display the character with the main weapon type, and (2) include a description of the character on the character select screen.

The other players, that joins the game with a strategy already in mind, instead need information that is more function first. Answers to questions about which weapons, abilities and stats the hero have for example. This because, to make an assessment of which hero that will fit a decided strategy, the player needs to understand what the hero is equipped with, and thus what the hero is good and bad at. Design elements seen in different multiplayer and battle arena shooter games communicating this information is (1) information about role/class/type of the character, (2) information about the stats of the character, (3) information about the skills and abilities of the character, (4) tips and suggestions about gameplay with the character or game, and (5) video tutorials on how to play the character. Examples of the aforementioned design elements can be seen in appendix 3, where seven different games are included to visualize the design elements.

To sum up, the hero choice was affected by the strategy choice when a participant chose strategy first, and the strategy choice were affected by the hero choice because different functionalities in different heroes allowed for different types of successfully used strategies.
5. Discussion and conclusions

The discussion and conclusion will consider the strength and weaknesses in the result relating to the methodology used. Thereafter the strength of the result will be discussed regarding the findings described in the background of the report. Lastly there will be a discussion regarding ethical implications, possible future research and the project in further context.

5.1. Method discussion

The methodology contained four aspects worth discussing; (1) the definition of expert players, (2) the focus of expert players and strategies, (3) the design of the questionnaires, and (4) the interviews. All aspect will be described below.

5.1.1. Definition of expert players

When recruiting participants for the studies conducted, it was hypothesized that expert players would report more strategies than less experienced players. However, there are different definitions available of expert players, this because of the difficulty of defining skill level, especially in an area as gaming where there are several aspects influencing a player’s skill. The definition by Unsworth et al. (2015) was used together with the discussion of Sobczyk et al. (2015) in order to ensure participants invited would be skilled in the genre of the games that was tested in the studies. This resulted in the criterion that participants should play more than five hours of shooter games per week. To confirm participants met this criterion, a question was added to the screener asking, “In a typical week over the past 12 months, how many hours did you play the following types of games” (the question can be seen in appendix 1). The question was a close-ended question and offered seven different types of games together with four different answers. The questions asked about the game types Sports, Fighting, Shooters, Role Playing, Racing, Action/Adventure and Puzzle and the possible answers to choose from were (1) More than 5 hours a week, (2) 1-5 hours a week, (3) Less than 1 hour a week and (4) Don’t play. In both studies, the criterion was met by all but five participants, that reported playing between one and five hours of shooter games per week. In the screener, it was also asked how many hours in a typical week the participants played video games. One problem surfaced by asking the questions like this, namely that although most participants met the criterion of playing over five hours of shooter games per week, there was no data regarding if the participants in fact played six hours or 40 hours of shooter games each week. What the result showed was how many hours per week a participant typically played multiple genres of video games and if at least over five of these hours were with shooter games. The problem then, would be that a participant playing six hours of shooter games per week and one typically playing 20 hours of shooter games per week will probably have different skill levels in the game, even if both were defined as expert players. In the result of the studies, there was no way to examine this and compare number of hours spent on shooter games with observed behavior. It would have been more beneficial to let the participants fill in approximate number of hours for each type of game, or give them more alternatives to choose from in the close-ended question. Furthermore, the five participants that reported playing between one to five hours of shooter games per week and the participants that reported being familiar with the games through other sources than playing them showed understanding of the game and its heroes in the studies. This suggests that participants did not have to have played the specific game to be familiar with it and make meaningful decisions and therefore reporting strategies. It is therefore worth discussing that the definition used for expert players were not accurate enough. It would be interesting to extend the discussion of context to not only consider the amount of time with specific types of game, but also the
amount of time with a specific type of game compared to other types of games. In hindsight, a better definition of expert shooter games players could therefore be that the player should play more than five hours of shooter games per week and that the number of hours playing shooter games per week should exceed the number of hours per week the player plays other types of games.

5.1.2. The focus of expert players and strategies

The studies focused on expert players because the studies used strategies as measures of player behaviors. However, as discussed above, even though expert players were recruited, aspects such as lack of familiarity and knowledge of games and heroes still surfaced in the results. Including more casual (less experienced) players could have surfaced more aspects concerning hero and strategy choices, but the aspects would arguably consider reasons behind hero and strategy choices with less meaning and more improvisation. This because it was found expert players have a deeper knowledge of games and conduct problem solving before gaming more often than less experiences players. As improvisation and problem solving was seen during gaming with the participants, the results still include behaviors that assumedly would be used by more casual players.

Furthermore, it could be argued that the focus on strategies as behaviors occludes other types of player behaviors. The focus was on strategies due to the strong presence of strategies in games including hero characters. As mentioned in the introduction of this thesis, games with heroes offers the player with the choices between defined characters with different playstyles, therefore the choice of hero becomes a strategic one. Consequently, it was assumed that participants mainly would deal with strategies in their behaviors, and as shown in the result, the behavior were very much revolved around strategies. Furthermore, focusing on strategies also gave player behavior a more concrete aspect to observe, as well as delimited the area to fit the scope of the project. However, opening the focus to generally concern player behaviors could have given useful insights to player behavior around hero characters and is therefore a suitable area for further research.

5.1.3. Design of questionnaires

To answer open-ended questions in a questionnaire demands cognitive effort from participants (Lavrakas, 2008). This because the participants must formulate their experiences and thoughts in words. Most questions in the questionnaires were open-ended, because the purpose was to explore topics, more specifically used strategies. The questions about strategies were encouragements to describe the strategy the participant had used in one match, or the strategies that worked best for a hero. In the result, a variety of lengths were received for the answers to these questions, everything from one word to over 100 words. The descriptive and informative nature of the answers also differed, with some participants leaving answers with much detail and description and other participants leaving answers that were inaccessible for further coding. Take the quotes below as examples:

“I began the match playing as the [hero] which had one shotgun in eachhand. The shotguns were effective in close range, but getting close to an enemy was dangerous. So I tried another hero. [Hero] seemed to have an SMG and was very fast to get around with. The abilities enabled [the hero] to teleport a few meters in the same direction as I was walking. This made [the hero] were fast and hard to hit in QC-situations. [The hero] could also "rewind" the last meters [the hero] had moved which. This made me very brave in QC and i used [the hero] abilities alot. If multiple enemies was heading attacking ambushing me I could easily rewind myself away from them.” – Participant describing strategies used during a match.
“ran around, tried to kill enemies” – Participant describing strategies used during a match.

The first quote in detail describes the heroes used and what could be done with these heroes, while the second quote do not tell much about the actual strategy that was used by the participant, or if the participant had used a specific strategy at all. Lavrakas (2008) further wrote that because questionnaires are self-administered, there is no guarantee of getting “good” answers. During the studies, there were over 20 participants answering the questionnaires at the same time, it was not possible to follow every participant in the questionnaires controlling the quality of the answers.

Another disadvantage with questionnaires mentioned by Goodman et al. (2012), is the fact that if not designed properly, they easily produce inaccurate, or even deceptive results. There is no guarantee that the participants interpret the question with the same meaning as the intended meaning. Therefore, the design of the questionnaire, or the formulation of the questions are of vital importance in order to get accurate and useful data. During this project, questions were added to studies that were conducted at EA DICE, as mentioned in the method. The reason for this was to start the data collection as well as to test the quality of the questions. The questions added were “How would you describe the way(s) you played or the strategies you used?”, and “How did your choice of character affect the way you played?”. After looking at the result, the questions were changed to “Please describe the strategies you used in the match, feel free to use situations in the match as examples.” and “In general, how did your choice of character affect the way you played?”, additionally questions were added about the successfully used strategies with each hero. The biggest difference was that in the first version, both questions were asked at the end of the study, while in the revised version the question about strategies were asked after every match or round of gameplay. The change was made because it was observed that participants did not only use one strategy and when only asking about strategies in the end, a lot of strategies used by participants were not reported. The reason for this could be that participants did not remember all strategies used, or because it was too big of a cognitive effort to report all of them. Encouragement to share examples were also added to make it easier to find observations in the videos after the studies were conducted. While the revision of the questions increased the quality and amount of the answers, the studies still contained answers that could not be interpreted or used in the result. With that said, getting information about strategies from a larger number of participants could not have been done in another way in the timeframe of the project, since for example observing and interviewing one participant at a time would have taken too much time.

Another revision of the questions was done after the first multiplayer playtest study was conducted. In the first study, the question that asked about what heroes the participants had played was formed as an image grid of the available heroes where the participant clicked the heroes they played. This question was asked two times, one time during the first 30 minutes of gameplay and once again during the last 60 minutes of gameplay because of the order of the other questions in the questionnaire. During the entire gameplay interval, the question was open, when a participant chose a new hero, they clicked the hero in the image, and when they played another hero, they added a click to that hero in the same image. What was not considered was that when asking the question like this it only recorded which heroes the participants had played during the 30 respectively 60 minutes intervals, but not how many times during these intervals. In order to get more accurate numbers on how many times the participants played the heroes, the question was asked after each gameplay interval in the second multiplayer playtest study.

The active screener was sent out to participants as a questionnaire. In these questionnaires participants were asked about experiences with different games, as well as how much time they spent playing
video games, as mentioned in the discussion about the definition of expert players. What was discovered was that in some cases, participants did not answer the screener or questionnaire truthfully. For the first multiplayer playtest study, it was asked in the screener whether the participants had played the game and how much. All participants invited to the study reported having played the game. However, a similar question was asked in the questionnaire during the study, and then 9.5% of the participants answered that they had not played the game before. There is therefore a possibility that participants exaggerated their experiences in the screener, possibly to increase their chance to be invited for the session.

For the sake of getting an understanding of the behaviors of the participants, the work of Hughes et al. (2016) was included in the questionnaires. As described in the method chapter, Hughes et al. sought to create a scale to describe player behavior in multiplayer games. For this project, the finalized scale created by Hughes et al. was not used, instead all 52 items created concerning different behaviors were included in the questionnaires (see appendix 2). This because it was believed that the dimensions that were taken away for the final scale would give useful insights for the studies. However, what was found was that items regarding communication in multiplayer games could not be used in the studies, since none of the studies included tools for communication between participants in the form of chat or VoIP. The other items in the scale were divided into four different behaviors; Destructive behaviors, Role choice behaviors, Leadership behaviors and Autonomous/Cooperative behaviors. These items were used in the analysis to validate consistency in the reported behavior of the participants. However, since the items were created with focus on League of Legends, there were aspects of behaviors that were missing to make the measurement fit the games included in the study. For example, regarding the behaviors around role choice. The items from the studies of Hughes et al. only regarded carry or support roles, while there were other roles in the games included in the studies. Another discussion regarding self-reported behaviors worth mentioning is the fact that it was self-reported. Goodman et al. (2012) wrote that the accuracy of a questionnaire depends on the perceptions participants have of themselves additionally to that the participants must have the ability as well as the willingness to answer the questions truthfully. In the question regarding behaviors, there were items regarding destructive behaviors. These being if the participant used raging or trolling behaviors when playing. Some participant might not want to give a negative impression of themselves and could embellish the perception of themselves and answer that they do not use these types of behaviors even if they do. Playing together with other people in a lab environment is also likely to reduce destructive behaviors, because the participants know that they are being monitored and studied. When it came to the ability to answer truthfully, the participant had to rely on their memory to answer the questions, which might have influenced the answers as well, since the questions regarding behavior were asked at the end of the questionnaire. Because of the aforementioned drawbacks, the 52 items were disregarded from the presentation of the result and were only used to compare reported strategies to reported behaviors, investigating the consistency in the participants’ answers.

5.1.4. Interviews

The four participants chosen for the interviews were chosen because of their experience with the game and its franchise, as well as how many hours they spent on video games per week. This in order to target participants that would be able to discuss strategies and behavior on a detailed level. In the interviews conducted it was found that some participants were more comfortable with an interview situation than other participants. One participant was observed to have problems formulating themselves, as well as to hold a conversation while playing. The participant was not comfortable talking in English and the interview had to be done in Swedish. Before the studies, the participants
consented to participating in a playtest study, however the consent did not specify the nature of the study further. It would have been beneficial to inform the participants about the possibility that the study would include interviews.

Even if the interviews only were conducted with four participants, the interviews gave insights that did not surface through the questionnaires. When sitting with the participants and observing them play, it was possible to ask about the behaviors while they occurred. This resulted in a deeper understanding about why participants chose the heroes they did, as well as why they chose certain strategies. Agreeing with Goodman et al. (2012), the interviews gave a deeper understanding of the participants’ perceptions of the heroes and the game. The project would have benefitted by having the same setup on both games studied, or by asking similar targeted questions that were included in the interview in the questionnaires during the multiplayer playtests.

5.2. Result discussion
The following section concerns a discussion around the result from the studies in regard to the theories and hypotheses mentioned in the background chapter.

5.2.1. Participants
All participants in the studies were male, which might have influenced the results. It would have strengthened the results to have a better distribution of genders in the sample sizes. When players were invited to the studies, they had the choice to either answer the questionnaire sent out and have the chance to join the studies or not answer the questionnaire at all. In other words, the players needed to have a self-interest in joining, as well as the opportunity to attend the times the studies were planned for. Because of this, the control of distribution of participants were limited as the selection of participants were dependent on which players that had shown an interest in joining the studies, as well as which of these players that met the requirements of being an expert player.

5.2.2. Preferences influenced decisions
Two hypotheses were made concerning player preferences; that participants would choose heroes they preferred and that participants would choose the strategy with the highest individual pay-offs. Both hypotheses were strengthened in the results. It was found that participants chose strategies based on which strategies they preferred, and thus the strategies that had higher individual pay-offs to them. This was found because explicitly expressed preferred strategies predicted the behavior of choosing strategies. If a participant preferred a strategy, the participant was more likely to play that strategy in the game. This however, was not always the most strategic way to go. Some participant clearly mentioned during the studies that applying their preferred strategy without consideration of the hero and its abilities could lead to unsuccessful gameplay. It would have been interesting to ask about preferences towards strategies in the studies, in order to see in how many cases participants played the strategies they preferred the most, as was done with how many times participants chose to play heroes they preferred. The result around strategy preferences and strategy choices relied on participants explicitly reporting that they preferred a certain strategy through open-ended questions.

Harrington (2009) wrote that although players face the same choices, they can evaluate them differently depending on pay-offs. In this case, when the participants have chosen the same hero, they face the same choices when it comes to strategies. In other words, all participants using the same hero have the potential to do the same things in the game. However, depending on previous experiences and
preferences, the pay-offs of these decisions are different. The participant that reported preferring flanking strategies probably put more value into choosing to play that strategy than another participant reporting preferring to play supportive. The pay-offs do not only consider the success in the game, but the experience as well. A participant enjoying one strategy would have a higher pay-off choosing that strategy than a participant not enjoying that strategy, even if the strategy would be successful in both cases. Games are often played with the goal to entertain the player. The preferences of the player will affect the way the player perceives and behaves in the game. This is important to consider when designing games. Taking attitudes and preferences into consideration when evaluating a game will give useful insights in the behaviors of the player. Different kinds of players will behave in different ways in a game, this is valuable to consider when evaluating player behavior and gives insights in why some players find a game more entertaining than others.

5.2.3. Hero role and abilities influenced hero choice

It was hypothesized that participants would adapt their strategies to the role of the hero due to the work done by Domínguez et al. (2016) and Harrington (2009). Domínguez et al. wrote about the Mimesis Effect, the effect of players acting in accordance with the role of their character and Harrington wrote that different roles have different strategies. Aligned with this, one strategy did not apply to all the heroes in the studies, because of the difference in the designs of the heroes (the stats, weapons and abilities). In both games, the heroes were defined to have different roles or types, either by game design or the participants, and therefore, participants faced different choices depending on which of these roles or types the participants played. The roles and types concerned different classes or ranges of the heroes. Both games were asymmetric games, in other words, games that invited for different strategies depending on role or type of hero. A lot of participants mentioned that they adjusted their gameplay to the role or type of the chosen hero, because the role and type decided which strategies would be successful with the hero. Because of this, the hypothesis is strengthened by the result, the Mimesis Effect was seen in the regard that participants adjusted their behavior, in form of strategies, to the hero they played. However, where the Mimesis Effect is about how the player roleplays as the character they play, the results only showed the effect as result of the functionality of the roles and types. To investigate whether the Mimesis Effect was seen because the participants identified with the heroes they played, further research must be conducted.

Furthermore, it was hypothesized that players would choose a hero that was effective in the game because of the research made by Trepte and Reinecke (2010). Trepte and Reinecke wrote that character choice is dependent on, amongst other reasons, if the game is competitive or not. In other words, players tend to choose a character that will be successful in order to beat the game (or the opposing team). As was shown in the result, stats and abilities of the heroes influenced the choice of hero for participants, even if it regarded stats and abilities the participants expected the hero to have. One reason participants looked to the stats and abilities of the heroes was to see whether the hero would be effective. The hypothesis was also strengthened by participants choosing heroes to even team balance, and therefore increasing the team chances of winning the game.

5.2.4. Behavior of other players influenced decisions

Ross and Weaver (2012) wrote that other players’ behavior can serve as guide for a player’s own behavior. Because people observe and learn from other people. Hughes et al. (2016) also acknowledged the influence of other players in the decisions and behaviors of players in multiplayer games. From this it was hypothesized that other players would affect the choices of players.
In the results, it became apparent that the presence and behavior of other players influenced the participants’ behaviors in the studies. Agreeing with the authors named above, the result showed that both hero choices and strategy choices were influenced by other players. What was seen in regards of hero choice, was that some participants chose heroes in order to even the team balance. As have been described in the result, the studied game designs included informing the participants about what role that was missing in the team to have balance in regards of different heroes. Some participants in the study chose heroes that was needed for the team. In this sense, the participants were affected by the behavior of others, as that limited which heroes that proved strategic to pick, or was even available to pick.

It was also seen that strategy choice was affected by the behavior of others. What behavior that mainly changed by the behavior of others were whether the participants played cooperative or autonomous. If teammates kept together, more teammates joined the group and worked together, if the team did not gather, it was more likely for participants to play on their own. This agreeing with what Harrington (2009) describes as tipping. This was reported by participants in interviews, as well as from answers in the questionnaires, where participants reported their behavior was affected by the other players.

Since the tested games were multiplayer games, it was expected that the behaviors of participants would be affected by other players. This however was not a focus in this study, which becomes apparent as social aspects of the games in the form of VoIP and chat that could affect this behavior were not supported in the studies. The social aspect was more treated as a matter of course, and the results concerns the social aspects that surfaced when the participants had no communication with the other players. The result regarding other players influence on participants would be interesting to investigate further. For example, regarding the result that participant chose heroes because their teammates did not choose similar heroes (congestion) opens the discussion whether players are restricted in their choices because of other player decisions, and how this in turn affects the behavior with the hero. In other words, do players feel the need to play certain heroes or hero types/roles they do not want to play because of the choices of their teammates?

5.3. The project in further context

The project concerned two different games, in two different states. This gave a variety of heroes with different functions and abilities to investigate different player behaviors with. Expanding the study to more games, to validate the findings as well as explore more aspects of player behavior regarding heroes could be done in future research. Furthermore, since the studies did not include aspects of communication between the participants, it would be interesting to study the behavior of participants when they have the ability to communicate with other players, either through chat or VoIP. As mentioned, not including communication in the studies disregarded aspects especially when it came to other players’ influences on a player’s behavior in online multiplayer games. Not having VoIP or chat present in a multiplayer game context takes away opportunities for players to work together and therefore the social aspects regarding coordination of players are left out. As a result, there is a possibility that the choices of participant would have been different, if they would have had the opportunity to coordinate with the other players when making these decisions, as the influence of the other players in this case becomes more tangible. It would also be interesting to compare the social aspects as influencers compared to the other aspects that surfaced in this project. In other words, how much players are influenced by other players respectively internal factors such as preferences and familiarity.
Furthermore, the studies only concerned multiplayer shooter games, and thus not all types of multiplayer games that include hero characters. To expand the research, it would be interesting to look at other game types with strongly identifiable characters, such as the multiplayer online battle arena games mentioned in the introduction. A comparison could also be done to other types of multiplayer game characters to see whether the player behavior with characters are dependent on the identifiability of player characters. For example, it would be worth investigating how players behave with characters in multiplayer roleplaying games such as World of Warcraft as a comparison to characters in single-player roleplaying games such as The Elder Scrolls series. This would give further insights in player behavior around characters that are created by players through immense amounts of customization options and could broaden the work of Birk et al. (2016) concerning character identification dependent on customizations. Furthermore, a deeper investigation on player identification to heroes would also enhance the research, as it would give a comparison to the player identification present in single-player games.

In some extent, it was shown that familiarity with the game and its characters was necessary for participants to be able to report conscious strategies in the game, while it also showed that this was not true for all participants in the study. There is also a possible debate in how much time a player would need to get familiar with a game. This is an area possible for further research, how do we measure familiarity or expertise with a game or game genre? As discussed earlier the definition of expertise did not in all aspects suffice, so there is a gap in research concerning a definition and measurement around game expertise and familiarity. The level of detail particularly, a player that has played a game a lot with a certain character, will not be as good at the game with another character, for example. In the results, different aspects of knowledge around the games surfaced, knowledge about the hero, the game, other players and the genre of games. A way to use these different types of knowledge to create a new scale of expertise would be interesting to investigate.

In relation to this, the result indicated that less familiar participants preferred and played more heroes of the roles defensive and supportive. Whether different roles of characters in different games are preferable for new players and what is causing this preference is something that would be interesting to analyze further to understand how new players think about their choices before getting familiar enough with the characters and the game.

Furthermore, the project has been investigating the reasons behind hero choices and strategy choices. The insights of this could be of help when designing games, since it gives an understanding of how the player reasons when making in-game decisions. The result showed two different paths that the participants took in their decision making around heroes and strategies. By knowing these two paths, and the aspects influencing the steps in them, designers have the opportunity to guide the players through these paths in order to help them make informed decisions. The first path, that concerns choosing the hero first, then adjusting the strategy to that hero, highlights player needs to create a clear image of the hero, that will guide the behavior with the hero in game. The other path, that concerns choosing strategy first, then finding a hero that fits that strategy, highlights other needs, such as showing enough information about the stats and abilities of the hero, so the player will be able to determine if this hero will fit the chosen strategy. Investigating how many players that takes the different paths can be valuable to understand which information that is of most importance to show when presenting players with the choice of character. The strategies deployed in the studies also created an understanding of the decision makings and behaviors of players. It was shown that different players preferred different ways to play, which could highlight the importance of creating different experiences in the game to satisfy more players.
References


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Appendix 1 – Active screener questions

Presented below are the questions asked in the screener regarding the number of hours participants spent on video games and different types of games.

In a typical week, about how many hours do you play video games? ______

In a typical week over the past 12 months, how many total hours did you play the following types of games?

<table>
<thead>
<tr>
<th></th>
<th>More than 5 hours a week</th>
<th>1-5 hours a week</th>
<th>Less than 1 hour a week</th>
<th>Don't Play</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports (arcade or sim)</td>
<td>☐</td>
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<tr>
<td>Fighting</td>
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<td>Shooters</td>
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<td>Role Playing</td>
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<td>Racing</td>
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<tr>
<td>Action/Adventure</td>
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<tr>
<td>Puzzle</td>
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Appendix 2 – 52 items of behavior

Presented below are the 52 items of behavior from the article by Hughes et al. (2016) regarding a scale to measure behavior in team-based multiplayer online games. The items are presented as they were formulated in the questionnaires. As mentioned, the finalized winnowed scale mentioned in the article was not used, instead all initial 52 items were included in the studies.

For the following questions, consider how you played today.

For each item below, please report the frequency that you perform the behavior described in the item.

<table>
<thead>
<tr>
<th></th>
<th>0- Never</th>
<th>1- Rarely</th>
<th>2- Infrequent</th>
<th>3- Sometimes</th>
<th>4- Fairly often</th>
<th>5- Often</th>
<th>6- Very often</th>
<th>7- Always</th>
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<tbody>
<tr>
<td>I intentionally make the game more difficult for my teammates</td>
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<td>I intentionally make the game unpleasant for my teammates</td>
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<td>I have intentionally performed poorly in game</td>
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<td>I have fun even if it hurts my team’s chance at winning</td>
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<td>I enjoy making the game suck for my teammates</td>
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<td>I have fun trolling</td>
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<td>I troll</td>
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<td>I play carry-type roles (Active, dominant, high damage output roles)</td>
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<td>I play supportive roles (passive, utility-oriented roles)</td>
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<td>I carry my team</td>
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<td>I avoid carry roles</td>
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<td>I play with high damage output</td>
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<td>I take a leadership role in my team</td>
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<td>I am an autonomous player (independent, self-directed)</td>
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<td>I follow my own agenda</td>
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Optional: Feel free to explain your above ratings

For the following questions, consider how you usually play this game or other online multiplayer games.

For each item below, please report the frequency that you perform the behavior described in the item.

<table>
<thead>
<tr>
<th>I rely more on my ability as an individual player than the power of team unity</th>
<th>0- Never</th>
<th>1- Rarely</th>
<th>2- Infrequent</th>
<th>3- Sometimes</th>
<th>4- Fairly often</th>
<th>5- Often</th>
<th>6- Very often</th>
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<td>I rely more on my ability as an individual player than the power of cooperation</td>
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<td>I rely more on cooperation than my individual skill</td>
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<td>I rely more on team unity than my individual skill</td>
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<td>I am a team-oriented player</td>
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<td>I am a cooperative player</td>
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<td>I rage during games</td>
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If I do not have an objective at the moment, I ask my teammates what I should do

I call the shots for my team

I follow the commands of my teammates

I follow the calls of my teammates

If my teammates doesn't have an objective at the moment, I make the call for the next step

If my team makes a call I don't agree with, I do my own thing
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Compassion</th>
<th>Empathy</th>
<th>Prosociality</th>
<th>Resilience</th>
<th>Regulation</th>
<th>Responsibility</th>
<th>Assertiveness</th>
<th>Self-Regard</th>
<th>Other Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>If my teammates make a call I don't agree with, I'll follow it anyway</td>
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<tr>
<td>If I am more skilled or knowledgeable than my teammates, I share my knowledge with them</td>
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<td>If I see a teammate making mistakes, I tell them how to correct it</td>
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<td>If I am a stronger player than my peers, I try to help the weaker players improve their gameplay</td>
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<td>I do not teach other players how to improve</td>
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<td>I take up the responsibility to help other players improve</td>
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<td>I don't bother with helping other players to improve</td>
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<td>If I am frustrated with my teammates, I reproach them in chat</td>
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<td>I get verbally aggressive with other players</td>
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<td>Even if I am angry at my teammates, I do not show them my anger</td>
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<td>I have been described as a toxic player</td>
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<td>I refrain from comments that express negative emotion in chat</td>
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<td>If someone from the enemy team makes a good play, I congratulate his or her success</td>
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<td>If someone from the enemy team AFKs, I express my condolences</td>
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<td>If my opponents behaved honorably, I honor them at the end of the match</td>
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<td>I do not build rapport with my opponents</td>
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<td>Statement</td>
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<td>I encourage my teammates during gameplay</td>
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<td>If my teammates make a good play, I congratulate them</td>
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<td>If my teammates are having a poor play experience, I express my sympathy to them</td>
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<td>I try to build a sense of team unity in chat</td>
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<td>I don't bother with building team rapport</td>
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<td>I focus more on in-game play than rapport-building in chat</td>
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<td>I am not friendly towards the enemy team</td>
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<td>I treat my opponent as an antagonist</td>
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Optional: Feel free to explain your above ratings


Appendix 3 – Design elements

The different design elements are represented by different colored squares in the following images of character select screens in a variety of different multiplayer shooter or battle arena games.

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>Display of character with main weapon type</td>
</tr>
<tr>
<td>Orange</td>
<td>Description of character</td>
</tr>
<tr>
<td>Green</td>
<td>Role/class/type of character</td>
</tr>
<tr>
<td>Red</td>
<td>Stats of character</td>
</tr>
<tr>
<td>Purple</td>
<td>Abilities/skills of character</td>
</tr>
<tr>
<td>Blue</td>
<td>Tips/suggestions on gameplay</td>
</tr>
<tr>
<td>Purple</td>
<td>Video tutorial of how to play character</td>
</tr>
</tbody>
</table>

**Image 2.** Character select screen *Overwatch*
Image 3. Character select screen *Battleborn*

Image 4. Character select screen *DOTA 2*
Image 5. Character select screen *Heroes of the storm*

Image 6. Character select screen *Team Fortress 2*
Image 7. Character select screen *Paragon*

Image 8. Character select *Gigantic*