Ethics of Video Games: Behavioral Effects of Video Games on Players

Sharbel Chmoun
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands
s.chmoun@student.utwente.nl

ABSTRACT

Do violent video games cause behavior problems? This is a much debated issue. Not only does the public disagree, also researchers come to different conclusions. What causes the diverging opinions and scientific conclusions? Based on a study in ethics of computer games and the notion of second self this study tries to find an answer to this question. The second part reports about a survey among players. The focus in this study is on multiplayers games and the effect that game playing has in real life on gamers in the eyes of game partners. No significant changes in behavior over the long run, that might be influenced by the games they play, have been found according to this study.

Keywords
Ethics, games, behavioral effects, player.

1. INTRODUCTION

“Video games with violence make our children violent”. This is a bold statement made by parents and teachers without any evidence to pin aggression of children on video games. Whether this is true or not, is difficult to prove. With video games becoming more popular each year, this statement is becoming more relevant as well, because if this statement is true, it might harm children in the development of their morals. The article Little by little, violent video games make us more aggressive [12] on TIME shows how (according to the researcher) there is more aggressive behavior with children who are exposed to video games. This article shows some studies and their results, and compares them, where some of them contradict. It first shows some studies that agree that violent video games increase violence, but then studies that show there is no link between them.

An example of an argument that video games make children violent; a child does not know the difference between fantasy and reality, so when violence is acceptable in a game, the child will think it is acceptable in real life too. This is a rather bold statement, leaving out a lot of factors that might influence this violent behavior as well. In the same article, other researchers claim that there is no direct correlation between video games and more aggression, that there are too many factors left out. This is not the only example where researchers do not agree with other researchers. Another example being the article Do video games make people violent?[7] on BBC. Here 200 academics signed an open letter criticizing controversial new research suggesting a link between violent video games and aggression. On http://videogames.procon.org/ arguments on whether or not violent video games contribute to youth violence. So the statement of “Video games with violence make our children violent” is not proven nor refuted, even among researchers. Another great example of disagreements between researchers can be found in the APA review report [2]. This report looked at research literature published between 2005 and 2013 that focus on violent video game usage. A total of 170 articles were compared, and based on this a conclusion was drawn. This report will be examined further later on.

Many of those studies research how violent games make children more violent, and the outcomes of those researches are inconclusive. This is either by lack of proof, or leaving out too many factors when researching, so the results are not covering every aspect of the research. Most researches focus on whether violent video games make children more aggressive or not.

Vague concepts like “game” and “player” need to be well defined and explained in order to answer any question. The book The Ethics of Computer Games [13] by Miguel Sicart provides a detailed explanation on several topics which seem to be taken for granted by researchers. This book not only carefully explains the terms “game” and “player”, but also what the interaction between those two are, and how this interaction is interpreted by the “player”. This book mentions the “second self”, who is the state the player is in when playing a game, which is not necessarily the player itself. This “second self” is also referred to as a “player-subject”, first mentioned on page 11. Here is stated:

“I will argue that being a player means creating a subject with ethical capacities who establishes phenomenological and hermeneutical relations with the subject outside of the game, with the game experience, and with the culture of players and games. It is not a self parallel to the out-of-the-game self, but a mode of being that takes place in the game”

These subjects will be explained in more detail later. Since this will be about the ethics of games experienced by players, an interesting aspect to look at is how/if these experiences have effect on the player’s behavior while and after playing this game.

This paper will look at video games and players from an ethical point of view. Here an ethical point of view means how this has any behavioral effect on human players, be it positive or negative. When knowing what the ethical views are on a video game and a player, the final step for analyzing this will be done in the form of a survey. The goal of this survey is to find out if
there are differences between ingame and outgame behavior of gamers along various traits in the eyes of their game friends.

2. PROBLEM STATEMENT
As stated in the introduction, the amount of people playing video games keeps increasing. During the years there have been many claims suggesting that video games with violence, are making people violent. These claims are not backed up with any proof, and are merely speculations. Claims with proof do not cover every factor, and are therefore again insufficiently argumentative. An example for this is the article on TIME [12] given in the introduction. On the other hand, claims saying that games do not make people violent, encounter the same problem; they are either not backed up by (relevant) proof, or are merely philosophical theories without empirical data.

Finding out if video games do have effect on a player’s behavior is difficult. Someone’s behavior cannot easily be measured, neither inside a game nor outside. In order to measure this as exact as possible, it first has to be clear what the problem is. In the introduction is mentioned about what a game is, and what a player is etc. Words like “game” and “player” are used loosely, and are usually not specifically looked at. A problem with claims about video games, is that those claims do not keep in mind what a “game” exactly is, and what a “player” is, why the “player” behaves like this, and why/when it matters. Simple words that are used have to be explained in detail to understand the ethical effects on them. This will be discussed later on.

After explaining the basics, this paper will continue by clarifying the methods of obtaining objective data. Obtaining objective data concerning a subjective topic (ethics) is very important. The methods section specifies how the obtained data is measured as objective as possible.

2.1 Research Questions
Based on the problems encountered in the text above, the following research questions based on an ethical view are:

1. To what extend does a person differ regarding behavioral traits when playing an online multiplayer video game, and when not?
2. Do online multiplayer video games change the behavior of a person over time?
3. Why are there disagreements among researchers on the subject of violent video games increasing violence?

Here the first research question looks at behavior during a video game, the second research question looks at change in behavior after/while playing a video game for an extended amount of time, and the third looks at studies of other researchers.

3. BACKGROUND INFORMATION
3.1 Video game from an ethical view
The words “video game” have been mentioned several times. A video game is seen as a game, which is played on a computer, where the player has to solve problems in order to finish the game. While this is true, it is not relevant for this research. Here the ethical aspects from a video game are more relevant. So from an ethical view, what is a video game? According to Jesper Juul’s Half-Real [6], a game is defined as:
“a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome and the consequences of the activity are optional and negotiable”

Where video games would be:
“Games played using computer power, where the computer upholds the rules of the game and the game is played using a video display”

According to this a game is defined as an object consisting of a set of rules that project a game world in which agents (in this case players) interact. How these interactions are experienced by the agent determine how the agent experienced the game. This means a video game is just an act of choices and decisions, a voluntary self-evaluation of the agent. In other words a video game by itself is not an ethical object, but rather the experience gained by the agent that determines what the ethical values are. However, these choices and decisions given by the video game (created by the game designer) can be provoking and suggestive. Take as an example the game Manhunt, here the game forces the player to commit crimes. The player itself has to comply if it wants to progress in the game. By creating a game world with a set of rules and a level design that limits the player’s choice, ManHunt creates an ethical experience, depending on how the player interpreted the game.

3.2 Player from an ethical view
Technically as soon as a person starts playing a game, he/she is a player. Looking at it from an ethical view with Sherry Turkle’s The Second Self: Computers and the Human Spirit [15], Turkle pays attention to the influences of video games in the constitution of that “second self” that comes into being when in contact with digital devices. The book The Ethics of Computer Games also explained the second self (here named “player-subject”) using Turkle’s paper. Here the second self can be seen as a relatively autonomous self that takes over whenever experiencing a video game. This means that when a player starts up a game, some sort of second version of the player “takes over” and plays for the player. So whenever the human player experiences anything inside a video game, it is the second self which experiences it. Whether or not these experiences are passed through to the human player is not clear. According to Sicart [13], this second self contains the experiences from the games played previously, this means that for example, when playing a new shooter game, your fingers automatically go to the wsd keys for movement. This happens autonomously by the second self. Even when outside of a game, when the human player discusses about the game, the second self’s experiences will be discussed about. This paper will assume the second self as explained by Sicart.

Suh [14] has concluded that there is a notable difference between the identity of a person, and the identity of that person in a virtual community. Suh used the term “self-discrepancy” to describe instances in a virtual community. Here “self-discrepancy” shows an existence of the “second self”. A virtual community is explained as a virtual setting, which can be directly translated to a video game. A virtual setting is not necessarily a video game, but a video game is a virtual setting.
4. METHOD OF RESEARCH

The first and third question are answered with a mixture of literature study and a survey (see Appendix 5). The second question with the survey. This literature study will mainly consist of the behavioral aspects of players. It has to be very clear what a “player” is. With this, knowing exactly what a “game” is, is needed too. Since the questions are about the (behavioral) effects on players, it is important to know what effects are on the human player as well as the second self. This survey will try to assess whether behavioral changes while playing a game reflect on behavioral changes when not playing a game. Since this is about morals of a human being, the answers might be subjective, especially when the person is asked about changes in its own behavior. Since this survey should be as objective as possible, it will consist of questions about another human player. This means that the person filling in the questionnaire should answer the questions based on behavior of someone he/she has played with. This will limit the survey (and research) to multiplayer games, in order to keep the results as objective as possible. These surveys will be sent out using Reddit (www.reddit.com). Reddit is a social news aggregation, web content rating and discussion website. On this site there are Subreddits which are parts of the site dedicated to specific subjects. By sending these surveys to specific Subreddits which are multi-player games, the power of the internet can be used to fill in said surveys. The players on those Subreddit are in some way invested in the video game, since they are active on that Subreddit, making them valid candidates for the surveys.

For this survey, some specific multiplayer games where moral aspects are present will be chosen for this research. Examples of these games are World of Warcraft and Call of Duty.

Conclusions from the analysis of this questionnaire are used to answer the research questions.

5. SURVEY

In this survey and the results from it, some words are used which might not be familiar to some. These words are explained in table 1.

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingame</td>
<td>When the player is currently playing a game.</td>
</tr>
<tr>
<td>Outgame</td>
<td>When the player is currently not in a game. This is the complement of ingame.</td>
</tr>
<tr>
<td>Start</td>
<td>In this context, start means the point in time when the respondent has known the person very recently.</td>
</tr>
<tr>
<td>After</td>
<td>In this context, after means a point in time when the respondent has known the person for a decent amount of time. This amount of time is not specified, it is depending on what the respondent thinks is a decent amount of time.</td>
</tr>
</tbody>
</table>

Table 1. Word explanations

5.1 Goal

In order to investigate whether “video games change your behavior” is true or false, a research in the form of a survey was done. The research focuses on the following hypotheses:

1. Changes in personality traits ingame do not reflect on personality traits outside gaming.
2. There are no differences between personality traits in a game and outside gaming.

5.2 Method

For this research a survey (seen in Appendix 5) had to be filled in, concerning the behavior of a friend. This means that the person filling in the survey did not answer the question about himself/herself, but rather about someone else. When answering questions about yourself, people tend to be more defensive, resulting in subjective answers. By this format, it is hoped the results would be more objective. Other than that, change in behavior is more noticeable by someone other than the person self.

The included traits are: dominance, assertiveness, politeness, helpfulfulness, handling winning and handling losing. Traits like aggressiveness are not chosen, since this survey is about answering questions regarding a friend. Adding negative traits might attract more subjective answers, since one would not want to be too negative regarding a friend.

The survey was put on Reddit on multiple subreddits. These subreddits’ topics were either games in which violence was present, or groups of gamers. Anyone visiting those subreddits was able to voluntarily fill in the survey.

The sample consisted of 343 random Redditors from all over the world. Other than having a friend/relative with who they play games with, there were no restrictions. 5 of the responses were fake (these responses stated that their friend gamed for more than 18 hours per day, it is safe to assume that those are not filled in truthfully), since some answers could not be correct, resulting in 338 valid responses.

5.3 Results

Of every trait was looked if there was a change in behavior over time, for ingame as well as outgame. This was done by comparing the scores of after a while of knowing the person, with the scores of at the start of knowing them. This can be split in 9 cases. These 9 cases are combinations of ingame decrease/increase/unchanged with outgame decrease/increase/unchanged. This can be seen in Appendix 1. Here the most occurrences are at the ingame and outgame unchanged behavior.

The results of paired T-tests over a trait from ingame to outgame at the start, and for after a while can be seen in Appendix 2. Of the included traits only handling winning and handling losing have a significance higher than 0.05, this means that for these traits there is no statistically significant difference between the ingame and outgame behavior. Since all other traits have a smaller significance than 0.05, it means that all other traits do have a statistically significant difference. Most personality traits differ ingame from outside a game.

Spearman correlation test was used on the traits between ingame and outgame. This is done for start and after (Appendix 3). For all traits there is a strong positive correlation between ingame and outgame. When looking at the numbers, every trait
from the start is rather close to a correlation of 0.5, which is de
boundary of a strong to a moderate correlation. The significance
was left out, since all values were .000. The correlations
between ingame and outgame are weaker at the start than the
correlations between ingame and outgame after a while.
Finally the differences between the outgame traits over time
was calculated (outgame after – outgame start = difference over
time), same for ingame, and then looked at the correlation
between those. This can be found in Appendix 4. Polite,
handling winning and handling losing were all deemed
insignificant, which means they do not have a statistically
significant correlation. Dominant, assertive and helpful do have
a significant correlation, but the values are very low, implying
in a weak correlation. This means, that over time, the
differences between ingame behavior and outgame behavior do
not correlate. Appendix 1 confirms these weak correlations;
when looking at Appendix 1, the highest occurrences were at the
unchanged traits, while the changed traits (decrease and
increase) were noticeably lower.
At one point in time (be it start or after) there are strong
positive correlations between ingame and outgame. But when
looking over time, those strong correlations either became
weak, or non-existent.

5.4 Conclusion
Appendix 3 shows how the correlation between ingame and
outgame is weaker at the start than after a while. Appendix 4
shows a weak to no correlation between ingame and outgame
behavior (confirmed by Appendix 1). This supports the first
hypothesis.
From Appendix 2, it was concluded that most personality traits
do differ between ingame and outgame. So the second
hypothesis is rejected.

5.5 Discussion
In this research, random people online had to answer questions
about their friends/relatives. Since these questions are about
someone they know, they might have tried to defend them in
some way, meaning the results of the surveys might be slightly
biased. It is not sure how objective every question is answered,
but that risk had to be taken, because nobody other than ingame
friends know their ingame behavior.

6. LITERATURE REVIEW
Many studies about the increase of violence regarding video
games exist, while not that many about change in behavior in
general, because the media has made this trait more relevant.
This is why the literature review will mostly look at this specific
trait. However, this paper still concerns the change in behavior
when playing video games.
“Violent video games increase violence among people”. This
statement is a reoccurring theme on the news as video games
grow bigger. From now on “the statement” will refer to this
statement, making it more readable. The statement was
researched many times, with a lot of different outcomes.
Whether the statement holds is a whole debate, but why? Why
is that multiple researches conclude into different outcomes?
The APA report [2] examined many recent studies, and have
concluded that there is a link between violent video games and
an increase in aggression. A link (correlation) does not
necessarily mean that the violent video games are the causation
of this increase in aggression. In order to know what this link
exactly means, it is useful to look through some specific articles
to see how those articles came to that conclusion.
According to http://videogames.procon.org/ there are
arguments for the increase of violence among people because of
violent games, but there are also counterarguments. This section
of the paper will dissect the website and look at how the
researches were executed and how the outcomes differ. This
whole webpage is about the statement.
The website consists of 11 arguments that claim that the
statement is true, and 14 statements that refute the statement.
Since this paper is about change in behavior because of gaming,
the focus will solely lie on the arguments that are related to this
subject. These arguments have references to researches, which
have been analyzed thoroughly, and compared to see why the
results are different. Firstly the arguments agreeing with the
statement will be addressed and secondly the arguments that
disagree. Based on this comparison a conclusion about the
nature of the disagreement in outcome of research between the
two will be drawn.

6.1 Arguments agreeing the statement
5 of the 11 arguments that agree with the statement will be
addressed, since these are about change in behavior. The other
arguments are left out due to overlap in content.

6.1.1 Playing violent video games causes more
aggression, bullying, and fighting
Do Children Who Bully Their Peers Also Play Violent Video
Games? [4] is a research on if children who bully also play
violent video games. For this research 1000 parents and their
1000 children ages 10 to 17, randomly picked all over Canada.
Both the parents and children had to complete a questionnaire.
The questionnaire consisted of first 8 questions about bullying
(all types of bullying), and a question of what kind of games the
children play. These games were rated by how violent the game
was. On the second part, 467 parents and 493 children did not
answer the question for reason unknown. A total of 397 parents
and 432 children reported video games that could be coded to
the aggressiveness levels as described in the research. This
resulted in a correlation between playing mature games and
bullying. However, a correlation does not imply a causation.
There is no claim that violent video games are a cause of more
bullying.

The Effects of Violent Video Game Habits on Adolescent
Aggressive Attitudes and Behaviors [8] had a similar research.
In this study 607 children from school (randomly picked)
participated in surveys. The subjects are tested on video game
violence exposure, hostile attributions and trait hostility. The
comparison is made between the current desired amount of
violence and that of two years ago. The results show that most
prefer more violence now than 2 years ago. Based on this, it
was concluded that children are more violent than they used to
be, because of video games. However, this only shows, is how
the second self likes an increase of violence. The real person
was not evaluated here. This research did not keep in mind that
the second self exists, and directly concluded the results on the
behavior of the children. Furthermore, again, it shows a
correlation, not a causation.

Longitudinal Effects of Violent Video Games on Aggression in
Japan and the United States [1] is similar to the previous
research. Again, questions were asked over time, and concluded
in a correlation between violent video games and physically aggressive behavior tendencies. It does not show a causation.

6.1.2 There is a broad consensus among medical associations, pediatricians, parents, and researchers that violent video games increase aggressive behavior
This argument refers to some researches that resulted in that many people think that violent video games result in an increase of aggressive behavior. This argument only shows what people think is true, but lacks any empirical based arguments.

6.1.3 Simulating violence such as shooting guns and hand-to-hand combat in video games can cause real-life violent behavior
This argument has refers to some studies that viewed if violent skills in video games (examples like dismembering someone with an axe, sword chainsaw or other weapon) can be learned by the ones playing it. They found that players did learn these skills, without proving that these skills are actually used in real life. There is no link with that these skills will ever actually be used. Other than that, arguments are given of children picking up guns from their home and shooting at bypassing cars. When they were caught, they said that they saw this in a video game. There is no proof of the video game being the causation of the shooting. There were further no mentions of how the children had acquired those guns in the first place.

6.1.4 Many perpetrators of mass shootings played violent video games
Again, some examples of shootings were given, and most of those shooters played video games. As of 2016 [9] there are 1.8 billion gamers. There were 4 examples given of shooters that play video games. Claiming that playing video games is a causation of violence by this argument, is close to saying that drinking lemonade is one too.

6.1.5 Violent video games desensitize players to real-life violence
For this argument, researches were mentioned in which computers were used to measure stress levels and other skin responses [3]. Here the participants were asked to play a violent video game for 20 minutes, then measurements were done. This resulted in higher violence ratings after playing the violent video games. The finding that violent video games are a cause of higher violence ratings shortly afterwards, is only partially relevant to the purpose of this paper. When someone is driving and gets cut off, that person is likely to become angry. This anger might even remain for the rest of the day, but is probably gone the next day. Would this mean that driving a car makes you angry? The focus of this paper is increase of violence in the long term. So in the direct question “Do violent video games make you violent for the next few minutes?”, then the answer is most likely yes, but not relevant to this research. There were also mentions of a research applying electrodes to the participants’ scalp for electroencephalogram recordings [5]. However, the setup of this research is the same as the previous one, and delivered same results.

6.2 Arguments disagreeing with the statement
It is hard to refute the statement, because you would have to prove how over an extended period of time there are no changes in aggression while playing video games. It is difficult to do so, since there are so many other factors also playing a role that may influence the outcome. This is why only 3 out of the 14 arguments were selected and explained further. The other arguments were either not backed up by scientific studies, or a mixture/variation of the chosen arguments.

6.2.1 Sales of violent video games have significantly increased while violent juvenile crime rates have significantly decreased
With this argument there are statistics shown that with the increase in sale of violent video games, the juvenile crime rates decreased. This means that the sale of violent games does not mean more violence among youths. These numbers might be inflated. Piracy means the distribution of games without it officially being sold. Since piracy keeps growing [17], this argument is probably invalid.

6.2.2 Studies claiming a causal link between video game violence and real-life violence are flawed
This argument has been used when dissecting some of the previous arguments; some studies show a correlation, but not necessarily a causation. Here a research [16] tried to bypass the flawed causal links. Here gamers were asked to play a game over a longer period of time. As many variables as possible were kept track, to prevent the research from being flawed. The aggression scores for the gamers did not statistically differ from their normative beliefs of aggression than they were before playing the game.

6.2.3 Violent video games allow players to release their stress and anger (catharsis) in the game, leading to less real world aggression
This is a new perspective. Instead of claiming that violent video games make you more aggressive, this argument claims that video games are outlets to release stress and anger. Here some examples are given [10] [11] that result in gaming is a way of expressing anger/aggression. This is a great counter argument to some of the arguments that claim that video games do make you violent. This will be discussed later.

6.3 Conclusion
Most of the arguments supporting the statement describe how video games have negative influences on people. As described in the background information; a video game itself is just a set of rules. Claiming that a set of rules influence negative behavior is not convincing. The studies related to these arguments did not mention that it is how people perceive a video game is most significant in finding the influences that a video game might have. A video game by itself does not change behavior, how it is perceived does. Other than that, these studies resulted in either short term aggression, or left out too many other variables. This can be found in the discussion of the APA report [2]. Here one of the limitations on the research is “a lack of research that has examined the games’ effects over the course of children’s development”. This means that most of those articles showed a link between violent video games and increase in aggression in short term.

The argument that video games release anger counteracts the arguments of short term aggression. These short term tests were done right after playing a violent video game. Playing this violent video game releases anger. This would mean that right after playing a violent video game, there is still some anger left.
This anger will then be used as argument that video games make you violent, while in reality it is some left over anger that will fade away soon after.

Of the arguments claiming that violent video games do not make you violent, only the one about releasing anger seems plausible. The argument that too many factors are left out is possible as well, but it is hard to ever have every single factor controlled in such environment, resulting in no real solution.

Out of all these arguments, it does seem that using violent video games to release anger is the most plausible one.

One point the arguments that agree with the statement have in common, is that they directly translate ingame behavior to outgame behavior. The second self has no place in any of these arguments. Besides that, the arguments also see video games as moral objects, while a video game is just a set of rules. The interpretation of those games are not looked at.

The counter argument regarding releasing stress does keep the second self in mind. This is not directly stated in the papers, but releasing stress is the second self releasing emotions in the game. The biggest difference the arguments and counter arguments have is the notion of the second self (or a form of second self).

7. CONCLUSION
The data obtained by the survey rejected the hypothesis “There are no differences between personality traits in a game and outside gaming” and supported “Changes in personality traits ingame do not reflect on personality traits outside gaming”. This supports the idea of the second self and that video games do not change the behavior of a person over an extended amount of time.

The literature research revealed how most studies focused at the short time aggressive-level scores. Furthermore, none of the researches took the existence of the second self into account. The most plausible research concluded that video games are an escape of reality or a way of relieving stress.

So the difference regarding behavioral traits when playing a game and when not, is the second self. Over the long run, video games do not affect the behavior of a person. Some weak correlations were found, but they were deemed insignificant. And finally, the disagreements among researchers on this topic is because many studies conclude a correlation (not causation) and do not take the second self into account

8. DISCUSSION
This research tried to receive data as objectively as possible by obtaining it indirectly. This gives an outside perspective on the behavior of a person. The reliability of the answers is questionable. It is difficult to obtain objective data on this subject, because most gamers have spent a lot of their lives hearing that video games are bad. This might trigger a defense mechanism, so that every time when the subject “gaming” is discussed, the gamer will most likely try to defend it. This could also be true for someone who answers questions about their friends. The fact that gaming has an impact on everyday lives is undeniable; the discussion has been going on for years. It is worth mentioning that this is what might be the problem: gaming has become a scapegoat. In the case of any negative reaction or life-event, it can be pointed out that gaming might have been an influence. A future research could be about why video games usually get negatively framed as soon as some violence is present. Why is there a huge problem whether gaming is good or bad in the first place?

This paper has concluded that many studies are missing the notion of the second self. What would their outcome be if this phenomenon would be taken into account?

The second self is an interesting phenomenon, that can be subjected to further research. How does a “different self” come to life? When is a person developed enough to distinguish itself from the second self? What are the factors that play a role in this?

The link between gaming and change in behavior is an important one to investigate, especially after the excessive media coverage. If anything, this study shows that research on this topic is still in its infancy.

9. REFERENCES


10. APPENDIX

10.1 Appendix 1

<table>
<thead>
<tr>
<th>Outgame behavior score decreased</th>
<th>Outgame behavior score increased</th>
<th>Outgame behavior score unchanged</th>
</tr>
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### 10.2 Appendix 2

<table>
<thead>
<tr>
<th>Paired Samples Test</th>
<th>Paired Differences</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
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<td>Pair 1</td>
<td>dominant_outgame_start - dominant_ingame_start</td>
<td>-4.08</td>
<td>1.638</td>
<td>.089</td>
<td>-5.93</td>
<td>.233</td>
<td>-5.68</td>
<td>337</td>
<td>.000</td>
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<td>assertive_outgame_start - assertive_ingame_start</td>
<td>-2.57</td>
<td>1.607</td>
<td>.087</td>
<td>-4.29</td>
<td>.085</td>
<td>-3.05</td>
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<td>.003</td>
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<td>Pair 3</td>
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<td>-2.28</td>
<td>1.652</td>
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**Correlation is significant at the 0.01 level (2-tailed)**

*. Correlation is significant at the 0.05 level (2-tailed)

### 10.3 Appendix 3

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**Correlation is significant at the 0.01 level (2-tailed)**

*. Correlation is significant at the 0.05 level (2-tailed)
### 10.4 Appendix 4

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**. Correlation is significant at the 0.01 level (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed)

### 10.5 Appendix 5

**Gaming behavior survey**

Prerequisites for this survey: for filling in this survey you need to have experience in playing at least 1 multiplayer game with someone else. You have to play (or have played) regularly with him/her and know that person outside of the game too to some extent. This does not mean you necessarily have to know that person in real life, but at least know how that person is outside of games and a little bit how his/her daily life looks like.

These questions will be about that other person, please try to answer as truthfully as possible.

This survey should take about 5 minutes

**General questions:**

*What is your friend's age?*

(0-12) (13-18) (19-25) (26-40) (41+)

*How much does he/she play video games (not necessarily online multiplayer, but just video games) (approximately)?*

__ days per week, __ hours per day.

*How long do you know him/her (approximately)?*

(1 month-6 months) (6 months-1 year) (1 or more years)

**Outside of the game(s), DURING THE START OF GETTING TO KNOW HIM/HER, how well can you associate your friend regarding the following traits;**

(these questions should be answered with a number from 1 to 7, where 1 means absolutely not satisfies this property and 7 absolutely satisfies this property)

**Dominant** (for example talking over others, putting him/herself first) ; **Assertive** (taking charge, but not in an aggressive manner) ; **Polite** (take into account that swearing is considered as less polite) ; **Helpful** (offer to help, help when aid is requested etc) ; **Handling winning** (negative behavior when winning, like trashtalking, should result in a lower score) ; **Handling losing** (this means for example getting mad after losing)

**Outside of the game(s), AFTER KNOWING HIM/HER A WHILE, how well can you associate your friend regarding the following traits;**

Dominant; Assertive; Polite; Helpful; Handling winning; Handling losing

**When in game, DURING THE START OF GETTING TO KNOW HIM/HER, how well can you associate your friend regarding the following traits;**

Dominant; Assertive; Polite; Helpful; Handling winning; Handling losing
When in game, AFTER KNOWING HIM/HER A WHILE, how well can you associate your friend regarding the following traits:
Dominant; Assertive; Polite; Helpful; Handling winning; Handling losing

The last questions are statements
(Answer these by checking 1-5 where 1 is strongly disagree and 5 is strongly agree)
Over time I have noticed changes in attitude of my friend when outside of a game.
Over time I have noticed changes in attitude of my friend when in game.
Right now there is a notable difference between him/her playing a game, and when not (this can be positive differences too!).

(The survey can be found here: https://goo.gl/forms/vWGiLELm5xzNhFly1)