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THE MODERATING ROLE OF OSTRACISM AND FEELING OF COMPETENCE IN GAME-PLAY ON THE RELATIONSHIP BETWEEN VIOLENT VIDEO GAME PLAYING AND AGGRESSION: A LONGITUDINAL STUDY

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We certify that, as the jury, we have read this thesis and that in our opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts.

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ABSTRACT

THE MODERATING ROLE OF OSTRACISM AND FEELING OF COMPETENCE IN GAME-PLAY ON THE RELATIONSHIP BETWEEN VIOLENT VIDEO GAME PLAYING AND AGGRESSION: A LONGITUDINAL STUDY

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Violent video games have been a subject of concern for leading to real-life violence and aggression since the violent video game industry started to gain immense popularity. These concerns can be meaningful considering General Aggression Model (Anderson, & Bushman, 2002) and Social Learning Theory (Bandura, 1977), which both suggest that aggression can be learned and imitated by being exposed to it, which can be parallel with playing violent video games and therefore being exposed to violence. The majority of the previous studies supported those theories and concerns. However, some other studies suggested that the alleged positive relationship between violent video gaming and aggression can be biased or exaggerated. According to some models and studies, the exaggeration could be due to some factors like the feeling of competence in the games and ostracism of the participants since they can be potential moderators for the relationship between violent video gaming and aggression. However, the literature on this topic is insufficient to reach conclusions due to the lack of long-term and pre-registered studies that help avoid bias. Therefore, the current study aimed to investigate, with a pre-registered approach, whether the increase in hours spent playing violent video games and aggression through time will be related; and whether the increase in the feeling of competence in games and ostracism would moderate this relationship. The current longitudinal study consisted of three measurements performed within six-week intervals, which measured participants' violent video gaming hours, non-violent video gaming hours, aggression scores, ostracism scores and the scores of their feeling of competence in the games they have

played. Two hundred sixty-five people participated in this study, mostly male college students between 18-25 years old. The current study's results revealed no relationship between the increase in hours of violent video gaming and the increase in aggression over time. Also, the increase in the feeling of competence in games and the increase in ostracism over time did not moderate this relationship. Though, the only factor related to the increase in aggression was the increase in ostracism. Finally, the potential interpretation of the results, contributions and limitations of the study, and guidelines for future research were discussed.

Keywords: violent video games, aggression, feeling of competence, ostracism, longitudinal

ÖZ

ŞİDDET İÇERİKLİ VİDEO OYUNLARI VE SALDIRGANLIK ARASINDAKİ İLİŞKİDE SOSYAL DIŞLANMIŞLIK VE OYUNDAKİ BAŞARI HİSSİNİN MODERATÖR ROLÜ: BOYLAMSAL BİR ÇALIŞMA

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Şiddet içerikli video oyunları endüstrisinin popülerlik kazanmaya başlamasından bu yana, şiddet içerikli video oyunları, gerçek hayatta da şiddete ve saldırganlığa yol açma ihtimalleri nedeniyle endişe konusu olmuştur. Bu endişelerin, Genel Saldırganlık Modeli (Anderson ve Bushman, 2002) ve Sosyal Öğrenme Teorisi (Bandura, 1977)'nin saldırganlık içeren içeriklere maruz kalmanın, saldırganlık sergilemek ile ilişkisine yaptıkları vurguyu düşününce anlamlı olabileceği görülmüştür. Bu durumun, şiddet içerikli video oyunları oynamak, dolayısıyla şiddeti gözlemliyor ve deneyimliyor olmak için de geçerli olabileceği düşünülmüştür. Geçmiş çalışmaların çoğunun da bu endişeleri doğrulayıcı nitelikte olabilecek teorileri desteklediği görülmüştür. Fakat, bazı araştırmalar ise, şiddet içeren video oyunları ile saldırganlık arasında olduğu iddia edilen pozitif ilişkinin yanlı veya abartılı olabileceğini ileri sürmüştür. Bazı modeller ve çalışmalar tarafından, saldırganlık ve şiddet içerikli video oyunları arasında ilişki olduğunu söyleyen çalışmaların, bu ilişkide moderatör etkiye sahip olabilecek başka gizli değişkenleri hesaba katmadıklarından dolayı, gerçekte bulmaları gerekenden daha abartılı sonuçlar bulmuş olabileceği iddia edilmiştir. Ancak, bu konuda gerçekleştirilmiş boylamsal çalışmaların ve ayrıca yanlılığı önlemeye yardımcı olacak şekilde ön kayıt (pre-registration) yapılmış çalışmaların oldukça kısıtlı olması nedeniyle bu konuda kesin ve güvenilir sonuçlara ulaşmanın zor olduğu tartışılmıştır. Bunlara dayanarak, mevcut çalışmada, şiddet içeren video oyunları oynamak için harcanan saatlerin zaman içindeki artışının ve saldırganlığın zaman içindeki artışının ilişkili olup olmayacağı araştırılmıştır. Ayrıca, oyuncunun oyunlardaki yeterlilik duygusundaki zaman içindeki artışın ve dışlanma deneyimleri-

nin zaman içindeki artışının bu ilişkide moderatör etkiye sahip olup olmayacağı araştırılmıştır. Mevcut boylamsal çalışma, altı haftalık aralıklarla, toplam üç ölçümde gerçekleştirilmiştir. Bu süre içinde, katılımcıların şiddet içerikli video oyunu oynama saatleri, şiddet içermeyen video oyunu oynama saatleri, saldırganlık puanları ve oyunlarda hissettikleri başarı hisleri ölçülmüştür. Çalışmaya, çoğunluğu erkek ve üniversite öğrencisi olan ve yaşları 18-25 arasında olan iki yüz altmış beş kişi katılmıştır. Çalışmanın sonuçları, şiddet içerikli video oyun oynama saatlerinin zaman içindeki artışıyla saldırganlığın zaman içindeki artışı arasında bir ilişki olmadığını ortaya koymuştur. Ayrıca, oyuncunun oynadığı oyunlarda hissettiği başarı duygusunun zaman içindeki artışı ve dışlanma deneyimlerinin zaman içindeki artışın da bu ilişkide moderatör bir değişken olmadığı gösterilmiştir. Fakat, saldırganlıktaki zaman içindeki artışla, dışlanmanın zaman içindeki artışı arasında bir ilişki olduğu görülmüştür. Son olarak ise, sonuçların muhtemel açıklamaları, çalışmanın literatüre katkıları, sınırlılıkları ve gelecek araştırmalar için öneriler tartışılmıştır.

Anahtar Kelimeler: şiddet içerikli video oyunları, saldırganlık, başarı hissi, sosyal dışlanmışlık, boylamsal

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Benan Ayazoğlu Yassı

İzmir, 2022

TEXT OF OATH

I declare and honestly confirm that my study, titled “THE MODERATING ROLE OF OSTRACISM AND FEELING OF COMPETENCE IN GAME-PLAY ON THE RELATIONSHIP BETWEEN VIOLENT VIDEO GAME PLAYING AND AGGRESSION: A LONGITUDINAL STUDY” and presented as a Master’s Thesis, has been written without applying to any assistance inconsistent with scientific ethics and traditions. I declare, to the best of my knowledge and belief, that all content and ideas drawn directly or indirectly from external sources are indicated in the text and listed in the list of references.

Benan Ayazoğlu Yassı

August 2022

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LIST OF ABBREVIATIONS

VVG: Violent Video Game

SLT: Social Learning Theory

SDT: Self-Determination Theory

GAAM: General Affective Aggression Model

GAM: General Aggression Model

CHAPTER 1
INTRODUCTION

With the increase of technology, people have started to reach media almost everywhere and anytime they want. Being able to access media so easily brought the concern for the possible negative outcomes of highly used media, especially when the content somehow included violence (Freedman, 2002). In the beginning, the concern was mostly directed toward the media that was popular at that time (Freedman, 2002; Gunter, 2016). Violent television shows, series and movies being the most popular ones; also, music and video games with violent content mostly covered the popular research topics about violent media (Anderson et al., 2003). Almost sixty years of violent media research, including these topics, generally showed acceptably strong and positive links between violent media and aggressiveness for both long and short-term exposure (Anderson et al., 2003; Anderson et al., 2010; Gunter, 2016). The general sense was then shaped as parallel to the concerns about violent media that violent media can indeed be linked to some negative outcomes.

Knowing that violent media can be linked to some bad outcomes for those exposed to it, a new concern also emerged as years went by, specifically on video games which have violent content. The same concerns shown for other violent media during their popular times were also born for violent video games (VVG), again, mostly due to the emerging popularity of VVG in the 1980s and 1990s (Anderson et al., 2010; Kent, 2001). At some point, some researchers even discussed the possibility of the larger unwanted outcomes of VVG playing when compared to other types of media with violent content (Anderson et al., 2007; Polman et al., 2008). The main concern was heavily on whether playing VVG could be linked with any outcomes like aggressive thoughts, behaviors or even real-life violence of the players (Anderson et al., 2010; Anderson & Dill, 2000; Carnagey & Anderson, 2005). Past research and theories showed that these concerns could be meaningful considering past theories and models about aggression, like Social Learning Theory (SLT; Bandura, 1977) and General Aggression Model (GAM; Anderson & Bushman, 2002) since they claimed that

aggression is a learned process and can be a result of observation and imitation of the aggression, which can also be experienced by facing of violent video games.

Supporting these, many past studies revealed that getting exposed VVGs was indeed connected with aggressive thoughts or behaviors and sometimes real-life aggression (e.g. Anderson et al., 2010; Anderson & Dill, 2000; Carnagey & Anderson, 2005; Hollingdale & Greitemeyer, 2014; Meng et al., 2017). However, some previous studies did not find such a relationship between VVG and aggression (Ferguson & Rueda, 2010; Hilgard et al., 2019; Przybylski & Weinstein, 2019). So, the reasons for not being able to find consistent results for the relationship between VVG and aggression were discussed by some researchers (e.g. Ferguson, 2007; Ferguson & Kilburn, 2009). According to these discussions, the relationship between VVG and aggression might have been exaggerated due to publication bias problems and the lack of past research in the previous studies. However, Anderson et al. (2010) rejected this point of view and claimed that a proper meta-analysis with an inclusive approach should detect the real and positive relationship between VVG and aggression without any biases.

On the other hand, another explanation for the skepticism about VVG and aggression relationship was made by Przybylski and Weinstein (2019). They suggested that there might be some potential moderators hidden in the relationship between VVG and aggression, which can lead to misinterpreting this relationship as a direct and strong one rather than an indirect one. Considering Self- Determination Theory (SDT; Ryan & Deci, 2000) and temporal-need threat model of ostracism (Williams, 2009), and also some previous findings (e.g. DeWall, 2017; DeWall et al., 2013; Przybylski et al., 2014; Rajchert & Winiewski, 2016) feeling of competence in games and ostracism can both be examples of potential moderators due to their connection with aggression. Therefore, it was pointed out that exploring these potential hidden moderators could help the literature gain more reliable insight about the real relationship between VVG and aggression (Przybylski & Weinstein, 2019).

It is also important to highlight that previously mentioned literature was generally concentrated on the short-term VVG and aggression relationship and their potential moderators. However, most of the long-term findings also revealed a relationship between VVG and aggression, which was consistent with the majority of the short-term findings (e.g. Kühn et al., 2018; Möller & Krahe, 2012; Prescott et al., 2018). But the problem here is that, the previous literature on the relationship between long-term

VVG and aggression was limited to only a few studies. Therefore, the literature needed to be enriched with the VVG, aggression and their potential moderators to make reliable inferences about their relationships.

As far as we concern, since the long-term relationship between VVG and aggression was not previously studied, considering the feeling of competence in the games and ostracism experiences of the players as moderators, the current thesis aimed to study this specific relationship. Specifically, the aim of this thesis was to answer whether increase in hours of VVG playing would be associated with increase in aggression over time; and whether the increase in feeling of competence in games over time and increase in ostracism over time would moderate this relationship.

CHAPTER 2
LITERATURE REVIEW

2.1. THEORIES TO CONSIDER ON VIOLENT VIDEO GAMES AND AGGRESSION

The concerns on the link between violent video gaming and possible negative outcomes like aggressive behavior and aggressive cognition can be meaningful and understandable when we think about both SLT (Bandura, 1977) and GAM (Anderson & Bushman, 2002). These two well-known theories and models suggest that aggressive behavior is learned.

2.1.1. SOCIAL LEARNING THEORY (BANDURA, 1977):

SLT was originally developed with the help of the famous laboratory experiment generally known as the "Bobo Doll Experiment" done by Bandura et al. (1961,1963). According to the results of the experiment, the group of children who observed aggressive acts performed toward the "Bobo Doll" imitated the specific aggression that they observed and showed similar and high amounts of aggression toward the doll compared to the other groups of children who showed significantly less aggressive behavior towards the doll. This experiment proved that observing an aggressive model can lead to learning and imitating the behavior and therefore lead observers to show aggression.

In line with this, the SLT (Bandura,1977), which was developed with the help of the main findings of the "Bobo Doll" Experiment (Bandura et al.,1961,1963), mainly emphasizes that observation and imitation of a behavior are some key factors for learning and repeating the behavior. Different from the behaviorist approach, this theory suggested that not all learning processes were associated with only being in direct contact with the environment and via conditioning; observing the models and their behaviors, emotions or rewards they got were also accountable for the learning process (Bandura, 1977).

According to the SLT (Bandura, 1977), observing a model's aggressive acts being rewarded is a reinforcing factor for this act to be imitated by the observer more, compared to the case that the aggressive act is not rewarded or punished. This reinforcement process could lead the observers to believe that acting aggressively is a normal and preferable way to tackle problems in real life since they have witnessed that this kind of behavior was rewarded before.

These claims of SLT (Bandura, 1977) were later reviewed and discussed by some overview articles like Fryling et al. (2011), Nabavi (2012); and most recently by Cosme (2021). These overviews summarized that SLT (Bandura, 1977) was also recently examined empirically in many studies, and the combination of recent research and past research revealed that observing aggression is a strong potential factor for imitating aggression in real life, especially if the observed aggressive acts are rewarded.

It is important to mention that these processes can also be applicable to VVGs, and the potential consequences of VVG playing. According to Dill and Dill (1998), games with violent content generally aim to reward their players by giving them the opportunity to level-up, earn extra coins or get motivated by the chimes they hear as they harm other characters in the game. Since these game characters can serve as "models" as in the "Bobo Doll" Experiment (Bandura et al.,1961,1963), this rewarding process of the models in the game can lead the players to imitate the rewarded aggressive acts, which they observed from their game characters, and behave accordingly in real life (Dill & Dill, 1998).

In sum, SLT, which was developed in the light of the famous "Bobo Doll Experiment", can be applicable to the highly concerned topic of VVG and aggression relationship. Similar to the sense of the "Bobo Doll" experiment, the aggressiveness of VVG characters might serve as a "model" and lead to learning and imitating the aggressive acts, especially if these aggressive acts are rewarded, as in VVGs (Bensley & Van Eenwyk, 2001; Dill & Dill, 1998).

2.1.2. GENERAL AGGRESSION MODEL (ANDERSON & BUSHMAN, 2002):

GAM (Anderson & Bushman, 2002) and its forerunner version General Affective Aggression Model (GAAM; Anderson, 1997; Anderson et al., 1995; Anderson et al., 1996), were developed to explain the processes that lie behind aggression.

GAM (Anderson & Bushman, 2002) and GAAM (Anderson, 1997; Anderson et al., 1995) were created by holistically integrating the former theories and models about aggression, like Bandura's SLT (1977), as it was mentioned in detail previously. Other than SLT (Bandura, 1977), Social Interaction Theory (Tedeschi & Felson, 1994) was also taken into account for GAM (Anderson & Bushman, 2002) and GAAM (Anderson, 1997; Anderson et al., 1995), which suggested that aggressive actions can be manifested in order to reach a goal or a reward. In addition, Cognitive Neoassociations Model (Berkowitz, 1989, 1990, 1993) was also considered. This model highlighted that the aggression-related concepts are connected to each other, and triggering one of these concepts (e.g., "harm") can also trigger the other concepts linked to it (e.g., "use gun"). This model is important to mention here since it incorporates Dollard et al. (1939)'s frustration-aggression hypothesis in a more causal manner (Anderson & Bushamn, 2002).

At this juncture, the frustration-aggression hypothesis (Dollard et al., 1939) indicated that if someone's goal of reaching something is somewhat thwarted, this can lead to frustration and aggression. It is also linked to this hypothesis that if the object that thwarts reaching the goal is not available or reachable, the aggression occurred through the inability to reach the goal can be directed toward other targets that do not involve in the goal-thwarting process (Miller, 1944; 1948). This process can be related to VVG and aggression relationship since especially VVGs involve reaching goals while other characters/game mechanics blocks moving to the next goal or level (Kent, 2001; Przybylski et al., 2014). However, if the frustration and aggression that stems from the failure in the game cannot be directed to the game itself, which is generally the case, these feelings and attitudes can be directed to other people/objects in real life. So, if the need to reach the goal in the game is somewhat thwarted by the game, this could lead to frustration and, therefore, aggression, as mentioned in the frustration-aggression hypothesis (Dollard et al., 1939).

Also, Excitation Transfer Theory (Zillman, 1983) was also included in the new theory since it highlights that the effects of an emotionally arousing situation can last long. In specific, if some emotionally arousing situations occur consecutively, unknown effects from the previous situation can still influence the current response, like aggression. Lastly, another theory that was taken into account for the new theory was Script Theory (Huesmann, 1986, 1998), since this theory claims that getting faced with media

with violent content can lead to forming scripts, involving aggression. According to the theory, this process can be a leading factor for future aggressive behavior.

Therefore, the new aggression models developed with the former theories and models mainly expressed the importance of psychological and biological processes and their not-so-simple interaction for explaining human aggression (Anderson, 1997; Anderson et al., 1995; Anderson et al., 1996; Anderson & Bushman, 2002).

In detail, according to the first model, which is GAAM (Anderson, 1997; Anderson et al., 1995; Anderson et al., 1996), individual differences (e.g., aggressive personality) and situational variables (e.g., violent video gaming) may work together with some factors through the path that leads aggression. The specific factors, known as internal states, are aggressive cognition (e.g., aggressive thoughts), arousal (e.g., physiological or perceived arousal) and affect. (e.g., hostile feelings). These specific factors may also work with some appraisal processes, which may either be automatic (quick assessments of the situation with little attention) or controlled (more thorough and long assessment of the situation with more attention), which finally will lead to the decision for the aggressive action. This episode of the model was discussed for the short-term situations and was adapted by Anderson et al. (1995) to the short-term violent video gaming and aggression link by claiming that getting faced with short-term violent video gaming can increase aggression if the game leads to aggressive emotions, raises aggressive arousal and evokes some thoughts that are aggressive.

The model also has an episode that discusses long-term situations. For this episode, it is claimed that schemas, scripts and desensitization processes, which Anderson et al. (2010) defines it as a reduction of physiological reactivity to violence, working with repeating the aggression-related structures (e.g., violent video gaming), can be all responsible for the path that leads aggression with a boost in aggressive personality. So, people who constantly play VVGs can show more general aggressive attitudes, behaviors, beliefs, and desensitization, which will eventually lead overall aggressive profile again (Anderson & Dill, 2000).

The final form of the model, GAM (Anderson & Bushman, 2002), also suggests similar issues to the former version of the model, GAAM (Anderson, 1997; Anderson et al., 1995; Anderson et al., 1996). GAM claims that aggression is related to complex processes that involve the integrative and interactive role of social factors, personality,

cognition, development and physiology; and the process happens when the aggressive content is observed and merged with already existing mental structures and finally applied as one observed. If this scheme is repeated, the long-term process will lead to a desensitization effect for the observer and will lead to a more aggressive profile. So, the learning path that leads to aggression is complex, dynamic and cyclical and has many components in it (Anderson & Bushman, 2002).

This process can also be adapted to the VVG and aggression relationship since this type of observation can be valid both for real and fictional characters. Not only observing the character but also the nature of VVGs can lead the aggression procedure to be activated. These types of games also include violent and aggression acts and elements, and these factors can trigger aggressive structures of the gamer and can make these structures more available, and this can simply lead to future aggressive acts by the gamers. If this violent video gaming process is regularly repeated, this may lead the gamer to get desensitized to the violence and can act much more aggressively as repetitions occur through time (Anderson, 1997; Anderson et al., 1995; Anderson et al., 1996; Anderson & Bushman, 2002; Bozkuş, 2021).

So, VVG playing can cause the observation of the game characters' aggressive actions by the player. This can prime aggression and finally can lead to being more aggressive and behaving aggressively (Anderson, 1997; Anderson et al., 1995; Anderson et al., 1996; Anderson & Bushman, 2002; Bandura, 1977). So, the concerns on whether VVGs can be linked to aggression seem explainable and understandable also within a theoretical standpoint.

2.2. STUDIES ON VIOLENT VIDEO GAMES AND AGGRESSION

The concerns about whether violent video gaming could cause players to be aggressive were also highly important for empirical studies, as they were in models and theories. One of the earliest studies on this topic was by Dominick (1984), which studied whether time spent video gaming was related to teenager participants' aggression. To be able to measure those, Dominick (1984) conducted a correlational study with teenagers. They asked them how many hours they spend weekly violent video gaming and asked them to self-report whether they would act aggressively or not in some hypothetical scenarios. According to their findings, hours of arcade-type video games played at gaming salons were related to hypothetical self-reported aggressive

outcomes. However, since the study did not differentiate the arcade games as violent or non-VVGs, and took them as a whole "arcade game" category, this finding could not be enough to prove a VVG and aggression relationship. The same interpretations also apply to some similar studies like Gibb et al. (1983), Kestenbaum and Weinstein (1985), Rushbrook (1986), McClure and Mears (1986) and Lin and Lepper (1987) since they all used arcade games as one category and did not differentiate between violent and non-VVG categories objectively.

So, researchers started to come up with more proper and valid ways to study the VVG and aggression relationship as that topic started to gain much more popularity. Researchers started to try, for example, an experimental approach with a more precise "violent game" definition to be able to better understand the cause-and-effect relationship between VVGs and aggression, which will lead to more clear comments about these concerns about video gaming. So, they found that there was a causal relationship between violent video gaming and aggression (e.g., Cooper & Mackie, 1986; Irwin & Gross, 1995; Silvern & Williamson, 1987). However, the findings were not that solid again since they did not take into account the factors like game difficulty or excitement, which could be some of the misleading factors for aggression to appear increased (Anderson & Dill, 2000; Bushman, 1995).

Thus, Anderson and Dill (2000) tried to eliminate the limitations of those past studies and designed some studies to test the possible VVG and aggression relationship by taking possible interaction variables into consideration (e.g., aggressive personality). In their first study, they tested with college students whether VVG playing was associated with aggressive personality and aggressive behavior. The results revealed that higher VVG playing was indeed strongly associated with higher aggressive behavior and delinquency, but such a strong relationship did not exist for overall game playing. They also found that the players with more aggressive traits tended to have much higher aggression scores after violent video gaming compared to players with less aggressive traits. The findings for their first study were in line with what GAAM (Anderson, 1997; Anderson et al., 1995; Anderson et al., 1996) proposes since they did find an objectively positive relationship between aggression and violent video gaming, and showed that testing only overall gaming experience without distinguishing between violent and non-VVGs, as some past studies did, would not be objective enough to see such specific findings (Anderson & Dill, 200; Cooper &

Mackie, 1986; Irwin & Gross, 1995; Silvern & Williamson, 1987).

The second study by Anderson and Dill (2000), on the other hand, worked on the relationship between aggression and violent video gaming experimentally with college students again. They specifically wanted to see if playing VVGs affect aggressive behavior, affect and thoughts. For this, they made participants play video games with violent content by telling them a cover story that they were participating in for a "learning curve" study. After 15 minutes of gaming, participants' aggressive thoughts and affect were measured with the required scales. To measure aggressive behavior, they tell participants that they will compete with another participant (but these participants were ostensible) in a game in which the aim is pushing the button faster than the opponent, and the winning participant will give a "noise blast", as in Bushman & Baumeister (1998)'s study, in which participants were informed that they were playing a game with another player and that the winner of each level in the game would be able to control the noise level and let the losing player hear it through their headphones. It is important to note at this point that the aim of using the noise blast task there was to demonstrate the predisposition of the participants to show aggression (Twenge et al., 2001). Hence, according to their results, playing video games with violent content in laboratory leads to more aggressive thoughts and behavior. Therefore, the findings from both studies of Anderson and Dill (2000) were in line with GAAM (Anderson, 1997; Anderson et al., 1995; Anderson et al., 1996).

Some similar studies also found that playing VVGs increased aggression with "hot sauce" experiment as participants played VVGs, compared to participants who played non-VVGs, gave more intense hot sauce to their ostensible opponents, which showed their behavioral aggression (Barlett et al., 2009; Fischer et al., 2010).

Furthermore, Carnagey and Anderson (2005) studied whether hostile affect, cognition and behavior were associated with playing video games in three separate experiments. According to their first study, playing a violent car-race video game for 20 minutes leads to more aggressive affect, which was measured with a hostility scale, compared to playing a non-violent version of the game. In their second and third experiment, they found that aggressive cognition (measured by completing word fragments) and behavior (measured with noise blast task) increased when the violent acts in the video game were rewarded, compared to punished and non-violent versions of the same game. Therefore, playing VVGs increased aggressive affect directly while it increased

aggressive cognition and behavior indirectly by rewarding violence in the gameplay.

Krahé and Möller (2004) additionally studied with German teenagers and found that there was a strong association between playing VVGs and normalizing physical aggression. DeLisi et al. (2012) also found that playing VVGs and/or being inclined to play VVGs were associated with self-reported violence and delinquent behavior. Similarly, Hollingdale and Greitemeyer (2014) found in their study that the participants who played VVGs, regardless of whether the games being online or offline, showed more behavioral aggression compared to the participants who played neutral video games. Also, Meng et al. (2017) found that there was a positive relationship between the VVG play frequency of the participants and the aggression levels.

Supporting all these findings, some meta-analyses examined various cross-sectional and experimental studies, and they highlighted the negative impacts of violent video gaming since it led to higher aggressive cognition, affect and behavior according to the reviewed studies in the meta-analyses (Anderson, 2004; Anderson et al., 2004; Anderson et al., 2010; Anderson & Bushman, 2001; Sherry, 2001).

Contradicting with the previously mentioned findings, a few studies found no relationship between VVGs and aggression. For instance, Ferguson and Rueda (2010) designed an experiment which groups of participants, after a frustration task session, played either a VVG which involves a good main character, a VVG which involves a bad main character, a non-VVG or none of the games. Their results indicated that the type of video games the participants played in the experiments did not affect aggressive behavior of the participants. In fact, they even found that daily VVG playing was associated with less depressiveness and hostility after the frustration task.

Similarly, Hilgard et al. (2019) studied with male college students and made them play either a violent or less VVG with either hard or easy modes for 15 minutes. When they stopped playing the game, they got faced with a provocation task that was planned for them to show any behavioral aggression, if present. The results of this study indicated that the game being violent or not did not affect the behavioral aggressiveness of the participants, and the same was also valid for the game being easy or not and their interaction with game violence. So, according to the authors, brief exposure to a violent or hard video game in laboratory was not enough to result in aggressive behavior,

contrary to the past literature that claims to find robust short-term relationship between VVGs and aggression.

Additionally, Przybylski and Weinstein (2019)'s study examined the potential association between VVG playing hours and the aggression of teenagers. To do so, they asked the participants' caregivers about their teenagers' aggressive behaviors that they had observed recently and asked the teenagers about their violent video gaming times and the violent content in them. They also made teenagers self-report their trait aggressions to control individual differences. According to the results, violent video gaming hours were not related to an increased aggressive behavior of teenagers.

2.3. CONFLICT OF META-ANALYSES ON VIOLENT VIDEO GAMES AND AGGRESSION

Supporting the studies which found that there were no VVG and aggression relationship, some meta-analyses and studies also claimed that the relationship between violent video gaming and aggression seems to be non-existent and somehow exaggerated since there is a publication bias. So, the past findings showing a VVG and aggression relationship should not be counted as evidential (e.g., Ferguson, 2007; Ferguson & Kilburn, 2009; Przybylski & Weinstein, 2019). However, a highly popular meta-analysis by Anderson et al. (2010) discusses the inconsistencies presented in these meta-analyses that claim VVG and aggression relationship is not evidential by claiming there were not enough resources available for conducting a bias-free meta-analysis at that time. For example, there were no longitudinal studies or studies that checked on sex differences in the VVG and aggression relationship, and that led the meta-analyses that were published until 2004 to be non-bias-free, naturally (Anderson, 2004; Anderson et al., 2004; Anderson & Bushman, 2001; Sherry, 2001). So, Anderson et al. (2010) claimed that there was a need for a new meta-analysis that controls these inadequacies of the past meta-analyses and shows the real negative effects of VVGs, but this time, totally bias-free. According to their bias-free meta-analytic review of the up-to-date studies, the findings from previously conducted meta-analyses were supported. In specific, after the examination of both cross-sectional and longitudinal; experimental and non-experimental and culturally diverse studies, they found that playing VVGs was indeed related to increased aggressive behavior, aggressive cognition, and aggressive affect. Anderson et al. (2010) highlighted in this

meta-analysis that Ferguson (2007) and Ferguson and Kilburn (2009)'s past meta-analyses supported the VVG and aggression relationship to be overestimated and biased since they only used very little and poor existing literature and passed methodologically strong ones, and that led them to believe there was no evidence for VVG and aggression relationship. Therefore, Anderson et al. (2010) support the idea that if a meta-analysis about the VVG and aggression relationship is objective and proper, it should reveal the real negative effects of VVGs, such as future aggression.

2.4. POTENTIAL HIDDEN MODERATORS ON VIOLENT VIDEO GAME AND AGGRESSION RELATIONSHIP

The skepticism about VVG and aggression relationship being non-existent could be explained other than the publication-bias view with an alternative point of view; as Przybylski and Weinstein (2019) and Anderson and Dill (2000) claimed there might be "hidden moderators" that might lead a misinterpretation that VVGs are directly linked with aggression whereas the link is indirect and it forms with the help of some "hidden moderators". Therefore, determining whether VVG playing and aggression are related to each other is a difficult task. (Przybylski & Weinstein, 2019). In short, to be able to identify the true relationship between aggression and VVG playing, examining "hidden moderators" is highly crucial. (Przybylski & Weinstein, 2019).

2.4.1. THEORETICAL AND EMPIRICAL EXPLANATIONS OF THE POTENTIAL HIDDEN MODERATORS

2.4.1.1. Theoretical Background of Ostracism as a Potential Moderator

Understanding SDT (Ryan & Deci, 2000) will help in discussing some of the most crucial potential moderators on this subject. According to SDT, there are some essential needs: relatedness, competence, and autonomy. If these essential needs are precluded, this could potentially lead to aggressive responses indirectly through its negative relationship with well-being, for example (Kaur, 2018). Therefore, the association between playing VVGs and aggression may also be moderated by other factors connected to aggression, such as those in the previously mentioned essential needs of SDT (Ryan & Deci, 2000).

For example, SDT (Ryan & Deci, 2000)'s need for relatedness specifically proposes that aggression may emerge when the relatedness need, in other words, need to be in

connection to the outer world, is obstructed. The notion of ostracism, which Williams (2007) explains as rejection and social exclusion, can be a specific example of obstruction of the need for relatedness. Ostracized people feel a threat to their need for relatedness due to the experience of being excluded, which can lead to aggression (Ryan, Deci, 2000).

This idea can also be supported by the temporal need-threat model of ostracism which was proposed by Williams (2009). The temporal need-threat model of ostracism (Williams, 2009) suggests similar to SDT (Ryan, Deci, 2000), that aggression can emerge to cope with the unwanted feelings aroused by being ostracized. According to this model, when someone is ostracized, they experience three different stages. In the first step, known as the reflexive stage, the person feels angry after being ostracized. In the second step, called the reflective stage, the person shows aggression to be able to cope with the pain of being ostracized. In the last step, the resignation stage, the person can feel unworthy due to being continuously excluded. Hence, the second step of this model, which is the reflective stage, can explain the potential association between ostracism and aggression (Ren et al., 2016; Williams, 2009).

2.4.1.2. Empirical Background of Ostracism as a Potential Moderator

The previous theories/models about the connection between aggression and ostracism can also be supported by several empirical studies. For example, Chester and DeWall (2017) used the game "Cyberball" (Williams et al., 2000), a ball-tossing game, to manipulate the participants' feelings of exclusion. In the game, if the participants do not have any ball tosses, they would feel excluded, and if the participants do have ball tosses, they would feel included. After the game, the "Voodoo doll task" (DeWall et al., 2013), in which participants were given a doll and some pins to prick the doll, was used to measure the aggressiveness of the participants. They revealed that after manipulating and measuring aggression, ostracized participants showed greater aggression, which was caused by a desire to "heal" or achieve "homeostasis" in order to free themselves of the negative impacts of ostracism. They found that aggression served, in a sense, as a defense mechanism for being ostracized (Chester & Dewall, 2017). Likewise, Twenge et al. (2001) also showed that participants who were excluded exhibited greater behavioral aggression. This study's ostracism manipulation was different from Chester and Dewall (2017)'s manipulation since this study gave participants an ostensible scenario about their personality being

inclined to live and die alone. Their aggression measurement was also different since Twenge et al. (2001) used the “noise blast” task and not the “Voodoo doll task”. Another study that used the “noise blast” task was by Rajchert and Winiewski (2016), and they also found that participants who were ostracized with the Cyberball game showed greater aggression. So, the results about the positive relationship between ostracism and aggression were consistent, even if the manipulations or measurements differed from each other.

So, it makes sense to consider that ostracism can potentially moderate the relationship between aggression and VVG, and some previous studies also supported this idea. For instance, Przybylski et al. (2014) emphasized that considering ostracism as a moderator in the VVG and aggression studies is very important for future studies. Gabbiadini and Riva (2016) considered this view and applied ostracism in their VVG and aggression research. They expected that combining VVG and being ostracized would lead to even higher aggression compared to only VVG playing. They tested their expectation by manipulating the ostracism of the participants with the “Cyberball” game (Williams et al., 2000), either in excluded or included versions. The participants were then randomly distributed to play a VVG or non-VVG. Finally, their aggression was measured with the “Voodoo doll task” (DeWall et al., 2013). The results revealed in the end that the ostracism condition and VVG condition both had a main effect. Specifically, the aggressiveness of the participants in the ostracized group and VVG group was higher compared to the included group and non-VVG group, respectively. But, most importantly, the interaction of the VVG condition and ostracism condition revealed that the participants who played VVG and also were ostracized had the highest aggression towards the dolls (Gabbiadini & Riva, 2017).

2.4.1.3. Theoretical Background of Feeling of Competence in Games as a Potential Moderator

SDT (Ryan & Deci, 2000) can help discuss one of the potential moderators on the relationship between VVG and aggression. As mentioned before, according to SDT, there are three essential psychological needs, and if these needs are not met, aggressiveness may occur as a result. This theory, which its need for "relatedness" has already been mentioned, also includes a need for "competence," which also can potentially be a moderator because thwarting the need to feel competent may result in aggressiveness. Additionally, as it was discussed in the theoretical background of

VVG and aggression relationship, VVGs that involve duties like going to the next level and reaching some goals can cause aggressive behavior or attitudes of the participants. This can be explained -as was mentioned earlier- with the frustration-aggression hypothesis (Dollard et al., 1939), which was a foundational hypothesis for SDT (Ryan & Deci, 2000). According to this hypothesis, aggression can happen when the other game characters or game mechanics block the gamer from reaching the goal of the game, which can trigger feelings of incompetency. If the aggression that stemmed from the feeling of incompetency in games cannot be directed to the game, or game characters itself for them being unreachable, this can lead players to show real-life aggressive thoughts or behaviors towards the people/objects, which is a process that can be explained with Miller (1948)'s suggestions about displacement of aggression.

2.4.1.4. Empirical Background of Feeling of Competence in Games as a Potential Moderator

Based on the suggestions of SDT (Ryan & Deci, 2000), Przybylski et al. (2014) tested whether thwarting the need for competence in video games would actually result in aggressiveness. They revealed from their seven different studies that competence-impeding content in games results in more violent behaviors, thoughts and feelings. In sum, the players exhibited greater aggression when they felt being less competent in the game.

2.5. SHORT-TERM VS. LONG-TERM RELATIONSHIP BETWEEN VIOLENT VIDEO GAMES, AGGRESSION AND THEIR POTENTIAL MODERATORS

As can be seen in the previously mentioned sections, various experimental and correlational studies tried to find any possible relationships between VVGs and aggression and the potential moderators that could be linked to this relationship. However, this type of research could only give an idea of short-term relationships of effects between VVGs and their potential moderators. To be able to understand the long-term associations between violent video gaming, aggression, and their potential moderators, some researchers also conducted longitudinal studies.

For instance, Willoughby et al. (2012) studied the link between VVG play and aggression longitudinally with a survey that was given to adolescent participants for three consecutive years. They investigated if sustained VVG play was associated with

greater aggression through time and if non-VVG play was not associated with greater aggression through time. They found out that, even when controlling the possible third variables (e.g., gender, academic marks, peer deviance etc.), there was a significant association between sustained VVG play and an increase in aggression, but there was not a significant association between sustained non-VVG and increase in aggression through time as they expected.

Additionally, Möller and Krahé (2009) studied the longitudinal relationship between playing video games with violent content on the aggressive behavior of teenagers in Germany. They measured participants' aggressive behavior and the frequency of violent video gaming with 30-months-interval and found that the violent video gaming frequency in the first measurement predicted the physical aggression in the second measurement significantly with the roles of the mediation of the increase in students' hostile attribution bias and their approval of norms of aggression.

Moreover, Anderson et al. (2008) studied the longitudinal outcomes of VVG playing on physical aggression cross-culturally. The samples' age ranged between nine and 18, and the samples were both from Japan and the United States, which were diverse cultures in terms of violence since Japan has less violence culture compared to the United States. According to the results, for both cultures, physical aggression was predicted significantly and positively by the previous months' violent video gaming, and this outcome was neither due to earlier aggression nor gender since the two variable was controlled within the analysis. In conclusion, the study highlights that violent video gaming can be defined as a peril for future physical aggressive behavior regardless of the violence culture that people live in.

Additionally, Przybylski et al. (2014)'s previously mentioned paper also involves a long-term study that looked up for the association of competence in the relationship between video games and aggression. Similar to their previous findings of them, they found that feeling of being competent in the video games they played four weeks prior was negatively related to aggressive outcomes.

On the other hand, in another longitudinal study, adult participants were randomly assigned to either the VVG group, non-VVG group, and no-game group in which participants did not play any games at all. The participants played the games that they were assigned to every day for two months period. The results of this study showed

differently that the type of game that participants were assigned to play was not associated with the outcome of aggression. In other words, VVG play was not found to be associated with aggression in a longitudinal intervention setting (Kühn et al., 2018).

Similarly, another study that did not find any long-term relationship between aggression and violent video gaming was Ferguson and Wang (2019)'s. They studied with students from Singapore with a mean age of around 11 and 13 within the first and the second measurements consecutively. When they analyzed participants' aggression and violent video gaming within two-years-interval, they found out that the past violent video gaming did not predict aggression two years later, contrary to most of the findings about the long-term relationship between aggression and violent video gaming.

Considering meta-analyses to see a bigger picture, Prescott et al. (2018) reviewed past literature on long-term associations between VVG and behavioral aggression. The authors analyzed results from 24 studies conducted within various cultures, with the mean age of these studies' participants ranging between nine and 19. The time past between each measurement of these studies was between three months and four years. According to the investigation of the past longitudinal research on VVGs and physical aggression by controlling various covariates, results revealed that long-term violent video gaming was indeed related to future physical aggression, without any publication-bias.

So, according to most of the findings, the long-term relationship between VVGs and aggression was similar to the short-term relationship, which is, that VVGs are related to aggression. However, the long-term sources in the literature were very limited compared to the short-term sources, and this made it hard to build a consensus about the long-term association between VVGs, aggression, and moderating factors between them (Willoughby et al., 2012). However, Prescott et al. (2018)'s meta-analysis tried to overcome this issue with a meta-analysis and implicated that VVG and aggression have a real relationship without any publication-bias.

Even though there is a meta-analysis (Prescott et al., 2018) about the subject, the sources on violent video gaming, aggression and potential moderators to this relationship are still limited to this date. Therefore, the literature needs further new

studies and robust findings about the long-term association between violent video gaming and aggression; and potential moderators of this relationship, specifically like competence in the games and ostracism levels of the participants, as mentioned earlier.

2.6. OVERVIEW OF THE CURRENT STUDY

2.6.1. AIMS AND RESEARCH QUESTIONS OF THE CURRENT STUDY

Playing VVG and its association with aggressiveness has been an interesting and important topic for researchers. But, exploring the real association between VVG and aggression is challenging because of the potential moderators on the associations between them. There are many past short-term correlational and experimental studies conducted about this topic. However, as was mentioned in the previous section, especially longitudinal research on VVG and aggression relationship is scarce and needs to be enriched with new research, also considering the potential moderators of aggression and VVG relationship.

To the best of my knowledge, competence in the games and ostracism levels of the participants in previous longitudinal research as potential moderators that studied VVG and aggression relationship was only limited to Przybylski et al. (2014)'s study, which used competence in one of the many studies in the paper; and Gabbiadini and Riva (2017) which used ostracism as a predictor for violent video game and aggression relationship, so the sources are very scarce about these specific factors. Since studying ostracism in VVG and aggression topic is highly encouraged by past research (Przybylski et al., 2014), and the same also applies to competence in the game factor since there is very limited past research about it (Przybylski et al., 2014), involving these factors, especially in a longitudinal design, would be a good idea to help to fill the gaps in the VVG-aggression literature. Additionally, using pre-registration prior to data analysis would be a plus since literature also lacks this kind of research about this topic, and registration can help with avoiding bias in the literature (Przybylski & Weinstein, 2019).

Therefore, the current study aims to investigate the long-term relationship between VVG playing and aggression; and whether the feeling of competence in games and participants' ostracism will moderate this long-term relationship with a pre-registration.

According to the aims of the current study, our research questions are as follows:

Research Question 1: Is long-term VVG playing associated with increased aggression over time?

Research Question 2: Do feeling of competence in the games and ostracism of the players have a moderating effect on the long-term relationship between violent video gaming and aggression?

2.6.2. HYPOTHESES OF THE CURRENT STUDY

The hypotheses of the current study were pre-registered prior to data collection and can be reached at Open Science Framework (https://osf.io/fknb4). The pre-registered hypotheses and their explanations are as follows:

According to SLT (Bandura, 1977) and GAM (Anderson & Bushman, 2002); and many studies that supports those theories' suggestions, violent video gaming and aggression should come out to be related. Even though there are a few studies that did not find such relationships, we base our hypotheses on the well-established theories and previously mentioned majority of the research that supports as theories do. Our drive to support this is due to the fact that, especially in long-term contexts like ours, the possibility of finding a relationship between violent video gaming and aggression could even be more plausible considering the findings from Carnagey et al. (2007), which claims with also considering GAM (Anderson & Bushman, 2002) that, even 20 minutes of VVG play is enough for participants to get desensitized to violence. This means that they got used to the violence and became numb to it when viewing a violence scene, which in turn, can increase aggression. When considering even a 20-minute, very short, time period can lead to such effects, repeated exposure also most likely will lead to such effects since in a longer period, for example, months, there will be numbers of 20-minute gaming experiences and numbers of times gamers getting numb to the violence and this might lead even more apparent increases in aggression when violent video gaming increases, which get along with the suggestions of GAM (Anderson & Bushman, 2002). Therefore, since the current study is a longitudinal one, the first hypothesis of the current study is:

Hypothesis 1. There will be a relationship between the increase in hours spent VVG playing and the increase in aggression through time.

For the second hypothesis, the importance of also investigating long-term non-violent video gaming and aggression relationship was taken into account. According to Willoughby et al. (2012), to confidently claim that long-term violent video gaming is associated with aggression, it is also needed to make sure that non-violent video gaming is not associated with aggression. This is to make sure that the relationship was only special to violent video gaming and aggression. Therefore, the second hypothesis of the current study was determined as:

Hypothesis 2. There will be no relationship between the increase in hours spent non-VVG playing and the increase in aggression.

For the last two hypotheses, the importance of investigating potential moderators was taken into account, as Przybylski and Weinstein (2019) and Anderson and Dill (2000) suggested. Since Przybylski et al. (2014) also encouraged to further studying ostracism and gamers' lack of feeling of competence in games and mentioned the plausibility of them having a booster effect on the relationship between the positive relationship between violent video gaming and aggression, the third and fourth hypothesis of the current study was formed as:

Hypothesis 3. Ostracism of the participants will moderate the relationship between the increase in hours spent VVG playing and the increase in aggression, and for higher values of ostracism, the relationship will be stronger.

Hypothesis 4. Feeling of competence in games will moderate the relationship between the increase in hours spent VVG playing and the increase in aggression, and for lower values of feeling of competence in the games, the relationship will be stronger.

CHAPTER 3
METHOD

3.1. PARTICIPANTS

The present longitudinal study consisted of three measurements in total. For the first measurement, the participants were gathered mostly via the announcement that has been made on social media platforms (mostly from video gaming community pages and apps like Discord which gamers usually visit). The announcement of the study included the chance for the participants to win a 150 Turkish Liras worth of gift card from Amazon (amazon.com.tr) or Steam (store.steampowered.com), which will be given to three random participants each (they were also announced that each participation increases the chance of winning the lottery as can be seen in detail on the consent form (see APPENDIX I). For the last two measurements, the same people who participated in the first measurement were reached again via their e-mail addresses that they entered in the questionnaire of the first measurement. All participants filled out the consent form right before their participation in each measurement.

In the first measurement, 302 Turkish people participated. However, some participants were omitted from the data since they did not fit the criteria of age and/or education level, and this has left 265 participants at last for the first measurement, which met the criteria of being 18-25. In the second measurement, the previous 265 participants from the first measurement were reached vie their e-mails and 171 of the participants who fit the age, and the education criteria participated again. In the third -and the last- measurement, the previous participants from the last measurement were again reached via their e-mails and 149 of the participants who fit the age, and the education criteria participated again.

Normally, it was planned to include only university students for the study, but the obligatory omissions from the original data, and the fact that this study is a longitudinal and therefore a difficult type of study to maintain high numbers of participants, led us to include high school and university graduates who fit the known age criteria in the data too. In sum, with this regulation, the final data, which includes the data of the participants who did not miss any of the measurements, consisted of 145 participants. Detailed demographical information about the participants will be mentioned in the Descriptive Statistics section later.

3.1.1. RETENTION RATES THROUGHOUT EACH OF THE THREE MEASUREMENTS

Table 3.1. Retention Rates Across Measurements

Measurements	Number of Participants	Retention Rate (%)
1st Measurement	263	100
2nd Measurement	171	65.01
3rd Measurement	145	55.13

As can be seen in Table 3.1., the retention rate was %55.13, which means that %44.87 of the participants dropped out in the total three measurements. As far as we concern, our retention rate was consistent with the retention rates of previous longitudinal studies. For instance, according to a meta-analysis that investigated 143 longitudinal studies, the mean retention rate of those studies was %73.5, and those rates ranged between %53.4 and %93.6 (Teague et al., 2018). Consistent with this, as Hanna et al. (2014) mentions, some longitudinal studies which worked with young adult age group -like our age group- found similar but a little broader retention rate, which ranged between %45 and %88 (Dennissen et al., 2007; Galambos & Krahn, 2008; Pettit et al., 2011; Roisman et al., 2004; White et al., 2009). In addition, several longitudinal studies about violent video games and aggression, similar to the current study, also revealed similar retention rates, which ranged between %52 and %88 (Breuer et al., 2015; Gentile et al., 2011; Greitemeyer & Sagioglou, 2017; Kühn et al., 2018; Willoughby et al., 2012). These show that even if our retention rate seems low, it is in the acceptable and applicable range.

3.2. MATERIALS

All materials and documents used in this study can be reached at Open Science Framework website (https://osf.io/p8eyn/).

3.2.1. DEMOGRAPHICAL QUESTIONNAIRE

The demographical questionnaire asked participants about their gender, birth date and education level information. Since the current study aimed for 18-25 years old university student participants, these data were necessary to collect. The gender

information, on the other hand, was collected to analyze the data for males and females separately for exploratory analyses. The details of the demographical questionnaire can be found in APPENDIX II.

3.2.2. GAMING INFORMATION FORM FOR VIDEO GAME HOURS

Gaming information form for video game hours asked participants about the number of hours they have spent playing VVG and non-VVGs in the past six weeks on average. The participants were also given the definitions of what VVG and non-VVG are and some examples of those types of video games. The definitions were given to participants to make sure that they entered their playing hours without any misconception about what they were exactly entering for. These data were collected due to the need to measure gaming hours that were needed in the analysis, which will test whether the increase in VVG and non-VVG playing hours were related to an increase in aggression over time. The details of the gaming information form for video game hours can be found in APPENDIX III.

3.2.3. GAMING INFORMATION FORM FOR FEELING OF COMPETENCE IN GAMES

Gaming information form for feeling of competence in games asked participants about their feeling of competence during their game play in the past six weeks in average. The participants were asked to enter their feeling of competence for both VVG and non-VVGs they have played on a 5-Likert scale. These data were collected due to the need to measure feeling of competence in games that were needed in the analysis, which will test whether the increase in feeling of competence in VVG and non-VVG playing hours were related to an increase in aggression over time. The details of the gaming information form for feeling of competence in games can be found in APPENDIX IV.

3.2.4. OSTRACISM EXPERIENCE SCALE FOR ADOLESCENTS

We used the Turkish adaption of the Ostracism Experience Scale for Adolescents that was originally developed by Gilman et al. (2013) for measuring adolescents' experiences of being socially left out/ostracized with 11 items, 5-Likert scale and with two factors which were "excluded" and "ignored" (α=.93 for "excluded" factor, α=.94 for "ignored" factor). The adaptation of the scale to Turkish was made by Akın, Uysal

and Akın (2016), and they adapted the scale for adolescents again (α=.93 for "ignored" factor, α=.90 for "excluded" factor, α=.89 for the overall scale). An important point about using this scale for the present study is that our data was collected during the COVID-19 pandemic and some items (6,7,8,10, and 11th) in the Turkish version of the Ostracism Scale were probably not proper to use within such a situation. To be specific, the 11th item is "They invited me to go out to eat with them.", and within the pandemic context, rating this item according to their past six weeks was almost impossible because the cafes and restaurants were closed at that time and since the number of COVID-19 cases was really high during the whole data collection period, people generally got afraid of going out with anyone even when cafes and restaurants were open. Therefore, including these items could be misleading for measuring the real ostracism experiences of the participants in the present study, so, omitting these items from the scale and going on with the mini version of the scale (only with the items numbered 1,2,3,4,5 and 9) was a better option. Since there was a need to omit some items, and since the present study focuses on the young adult age group rather than adolescents, we had to measure reliability, too, to make sure it is safe to use the mini version of the scale for this age group. According to the calculations, the mini scale that measures participants' weekly average ostracism experiences in the past six weeks could be safely used in our young adult sample to measure their ostracism levels since its reliability was good according to the data of the first measurement (α=.82). These data were collected due to the need to measure ostracism that was needed in the analysis, which will test whether the increase in ostracism was related to increase in aggression over time. The details of the gaming information form for feeling of competence in games can be found in APPENDIX V.

3.2.5. BUSS-PERRY AGGRESSION SCALE

Buss-Perry Aggression Scale was originally developed by Buss and Perry (1992) to measure the aggressive inclinations of the participants with 29 items, 5-Likert scale and with four factors which were physical aggression, verbal aggression, anger, and hostility. (α=.85 for "physical aggression, α=.72 for "verbal aggression", α=.83 for "anger", α= .77 for "hostility", and α =.89 for the overall scale). The adaptation of the original scale to Turkish was made by Madran (2012) (α=.78 for "physical aggression, α=.48 for "verbal aggression", α=.76 for "anger", α= .71 for "hostility" and α =.85 for overall scale). According to our calculations in the present study and data, this scale

that measures participants' weekly average aggressive inclinations in the past six weeks was also reliable for our sample according to the data of the first measurement (α=.89). These data were collected due to the need to measure the dependent variable, aggression, that was needed in the analysis, which will test whether the increase in aggression over time will be related to increase in other research variables. The details of the gaming information form for feeling of competence in games can be found in APPENDIX VI.

3.3. PROCEDURE

This study was preregistered prior to data collection on Open Science Framework website (https://osf.io/fknb4). To collect the data, a survey that included the consent form, demographic questionnaire, information form about gaming, the Turkish version of the Ostracism Experience Scale for Adolescents (Akın, Uysal, & Akın, 2016) and the Turkish version of the Buss-Perry Aggression Questionnaire (Madran, 2012) was formed via Google Forms, and the link of the survey was shared with the gamers via the announcements that have been made mostly on social media platforms.

On the form, the participants were asked to read and agree on the terms and conditions in the consent form. The participants who agreed on the consent form continued to answer the demographic questionnaire on the form. In the next step, they were asked to fill out the Information Form about Gaming. Afterwards, they were asked to fill out the Turkish Version of the Ostracism Experience Scale for Adolescents (Akın, Uysal, & Akın, 2016). In the next step of the form, participants were asked to fill in the Turkish version of the Buss-Perry Aggression Questionnaire (Madran, 2012)

At the very last part of the form, participants were asked to enter their e-mail addresses to be able to reach them again for the next two measurements of the study and to be able to put them in the draw list and to reach the winners to give their gifts. At the end of the form of our first measurement, participants were thanked and reminded about the next measurement that would be held six weeks later.

Six weeks later, participants in the mail list got delivered the link of the form for the second measurement of the study. The same procedure in the first measurement was also applied in the second measurement, and the form stayed open for two weeks to be completed by participants. Another six weeks later, participants in the mail list got delivered the link of the form again, but for that time, for the third and the last

measurement of the study. The same procedure applied in both the first and the second measurements was also applied in the last measurement. Thus, the data collection procedure was completed.

After the completion of the data collection, the draw was held according to the conditions that were mentioned in the consent form (see APPENDIX I). The moment of the draw was recorded in a video, and that video was sent to all the participants' e-mail addresses. The three winners were e-mailed separately to be debriefed and to be asked about their preferences for the draw gift (Amazon or Steam gift card), and the preferred gift codes were sent to the winners' e-mail addresses (see APPENDIX VII).

3.3.1. STATISTICAL PROCEDURE

First, jamovi software (Version 1.1.9.0) was used to form a correlation table from the data of the first measurement of the current study. The correlation table was formed to have a basic and cross-sectional understanding of the variables before performing the main analyses. Next, for the main analyses, to test each of the four hypotheses, Linear Mixed Model analysis was conducted to be able to perform Growth Curve Modeling. First, IBM SPSS Statistics 26 was used to organize the dataset for this analysis. After the proper organization, the dataset was transferred into jamovi software (Version 1.1.9.0). For this analysis, the predictor was hours of violent video game playing and hours of non-violent video game playing, while the outcome variable was aggression, and the moderator variables were feeling of competence in games played and ostracism. Specifically, jamovi software's (Version 1.1.9.0) "gamlj" module was used for the analyses. For the Linear Mixed model analysis, the data were clustered according to the ID numbers assigned to participants and results were computed according to those participant-by-participant clusters. To check the reliability of the scales that were used, IBM SPSS Statistics 26 was used again.

It is important to note that, since the present study was a longitudinal one, there was a significant number of dropouts throughout the total three measurements. So, we ran two separate analyses with two different data sets: the first one being the data of who participated without any dropouts (attending to both three measurements), and the second one being the data of who participated with dropouts and the data without any dropouts combined. The aim here was to see if we could get similar results even with the dropouts being present.

CHAPTER 4
RESULT

In the result section, the analysis that was based on the data with dropouts and without dropouts combined will be presented. For the analysis of the data with dropouts omitted, APPENDIX VIII could be checked. The analyses of male and female participants' data could also be checked in APPENDIX IX. These were presented in the appendix sections since they did not reveal different results from the main results, which will be mentioned in the current section.

4.1. DESCRIPTIVE STATISTICS

Table 4.1. Descriptive Statistics of Demographic Information for the Data without Dropouts and with Dropouts Combined

Sample Characteristics	*n*	%	*M*	*SD*	Min	Max
Age			21.45	1.9	18	25
Gender						
Male	201	75.85				
Female	64	24.15				
Education						
High school student/graduate	18	6.79				
Bachelor student/graduate	225	84.9				
Postgraduate student/graduate	20	7.55				

Note. $N = 265$

The sample characteristics of the data without dropouts and with dropouts combined showed that the age ranged between 18 and 25, and the mean age of the sample was 21.45 (SD = 1.9). The number of the male participants (n = 201, %75.85) were significantly higher than the female participants (n = 64, %24.15). The participants were mostly bachelor student/graduates (n = 225, %84.9); and the number of postgraduate student/graduates (n = 20, %7.55) and high school student/graduates (n = 18, %6.79) were significantly lower.

4.2. MAIN ANALYSIS

4.2.1. CORRELATION TABLE FOR THE CROSS-SECTIONAL ANALYSIS OF THE VARIABLES

According to the data from the first measurement of the current study, a cross-sectional analysis of the correlation between violent and non-violent video gaming hours, aggression, ostracism and feeling of competence during violent and non-violent video gaming was carried out. This cross-sectional analysis was performed to get a more basic idea about the interaction between each variable before moving toward testing the main hypotheses of the current study.

Table 4.2. Correlation Table for the Cross-Sectional Analysis of the Variables

Variable	*n*	*M*	*SD*	1	2	3	4	5	6
1. VVG Hours	263	31.4	39.5	—					
2. Non-VVG Hours	263	11.3	35.2	.182**	—				
3. Aggression	263	73.7	16.8	.018	−.126*	—			
4. Ostracism	263	10.4	4	-.103	-.089	.247***	—		
5. Competence in VVG	263	3.77	0.897	.233***	.033	.20	-.135*	—	
6. Competence in Non-VVG	263	3.59	1.29	.170**	.160**	-.081	-.108	.164**	—

Note. VVG = Violent Video Games. * p < .05, ** p < .01, *** p < .001

As it can be seen in the correlation matrix above, the results indicated that violent video gaming hours was significantly correlated with non-violent video gaming hours, r (263) = .182, p < .01; feeling of competence during violent video gaming, r (263) = .233, p < .001; and feeling of competence during non-violent video gaming, r (263) = .170, p < .01. On the other hand, violent video gaming hours was not significantly correlated with ostracism, r (263) = -.103, p = .097, and aggression, r (263) = .018, p = .776. But, non-violent video gaming hours was significantly and negatively correlated with aggression, r (263) = -.126, p < .05. Non-violent video gaming hours was also correlated significantly, but this time positively, with feeling of competence during non-violent video gaming, r (263) = .160, p < .01; while it was not significantly correlated with feeling of competence during violent video gaming, r (263) = -.033, p = .589, and ostracism, r (263) = -.089, p = .149. However, ostracism was found to be

correlated with aggression, r (263) = .247, p < .001. Aggression, on the other hand, was not significantly correlated with feeling of competence during non-violent video gaming, r (263) = -.081, p = .188, and feeling of competence during violent video gaming, r (263) = .020, p = .749. Thus, feeling of competence during violent video gaming was significantly and negatively correlated with ostracism, r (263) = -.135, p < .05, and positively with feeling of competence during non-violent video gaming, r (263) = .164, p < .01. However, feeling of competence during non-violent video gaming was not significantly correlated with ostracism, r (263) = -.108, p = .082.

Therefore, the cross-sectional correlation results from the first measurement of the current study generally suggested linked to our hypotheses that violent video gaming hours were not correlated with aggression, contrary to the expectations from the literature. However, surprisingly, non-violent video gaming hours were significantly and negatively correlated with aggression, which again contradicted previous expectations that there should be no significant association between non-violent video gaming and aggression. In addition, as was expected from the literature, there was a positive correlation between ostracism and aggression. However, there was no significant correlation between feeling of competence during violent video gaming and aggression, which contradicted the past literature. Even though there were some surprising results that contradict the expectations derived from the literature, since these correlation results provide only cross-sectional explanation for the association between the research variables of the current study, they can only bring a simple point of view toward the main research hypotheses. Therefore, further longitudinal analysis for the main hypotheses testing will also be mentioned in the next sections to clarify the longitudinal associations between the factors and the potential surprising results as in the cross-sectional analysis.

4.2.2 RESULTS FOR THE ANALYSIS FOR THE RELATIONSHIP BETWEEN EACH VARIABLE WITH AGGRESSION (SEPARATELY)

For the beginning steps of the results, the association between the increase in each variable of the current study with the increase in aggression one by one was explored. This step of the results was necessary to better understand the specific links of the research variables with aggression individually, right before putting them in one analysis altogether, which could yield statistically different results. Since the current

study's main analysis will be based on the latter, an additional pre-exploration of the associations between the variables individually will be explained in the current section before the main all-in-one analysis that will take place in the next section. The similarities and differences between the results from these two types of analyses will also be discussed later in the next section.

Table 4.3. Results of the Linear Mixed Model Analysis for only VVG Hours on Aggression (without Dropouts and with Dropouts Combined)

			95% Confidence Interval				
Names	*b*	*SE*	Lower	Upper	*df*	*t*	*p*
(Intercept)	73.999	1.0166	72.007	75.992	260	72.789	< .001
VVG Hours	0.004	0.01	-0.016	0.023	366	0.348	0.728

Note: VVG = Violent Video Games.

As it can be seen in the Table 4.3., increase in the VVG hours was not associated with increase in aggression over time, $b = 0.004$, $SE = 0.01$, 95% CI [-0.016, 0.023], $t(366) = 0.348$, $p = .728$.

Table 4.4. Results of the Linear Mixed Model Analysis for only Non-VVG Hours on Aggression (without Dropouts and with Dropouts Combined)

			95% Confidence Interval				
Names	*b*	*SE*	Lower	Upper	*df*	*t*	*p*
(Intercept)	74.039	1.010	72.060	76.018	259	73.34	< .001
Non-VVG Hours	-0.043	0.025	-0.092	0.006	452	-1.71	0.088

Note: VVG = Violent Video Games.

As it can be seen in the Table 4.4., increase in the non-VVG hours was not associated with increase in aggression over time, $b = -0.043$, $SE = 0.025$, 95% CI [-0.092, 0.006], $t(452) = -1.71$, $p = .088$.

Table 4.5. Results of the Linear Mixed Model Analysis for only Ostracism on Aggression (without Dropouts and with Dropouts Combined)

			95% Confidence Interval				
Names	*b*	*SE*	Lower	Upper	*df*	*t*	*p*
(Intercept)	74.188	0.973	72.281	76.09	255	76.26	< .001
Ostracism	0.846	0.163	0.527	1.17	532	5.19	< .001

As it can be seen in the Table 4.5., increase in the ostracism was significantly associated with increase in aggression over time, $b = 0.846$, $SE = 0.163$, 95% CI [0.527, 1.17], $t(532) = 5.19$, $p < .001$.

Table 4.6. Results of the Linear Mixed Model Analysis for only Feeling of Competence in VVG on Aggression (without Dropouts and with Dropouts Combined)

			95% Confidence Interval				
Names	*b*	*SE*	Lower	Upper	*df*	*t*	*p*
(Intercept)	74.000	1.017	72.01	75.994	260	72.74	< .001
Competence in VVG	-0.597	0.588	-1.75	0.554	438	-1.02	0.310

Note: VVG = Violent Video Games.

As it can be seen in the Table 4.6., increase in the felling of competence in VVG was not associated with increase in aggression over time, $b = -0.597$, $SE = 0.588$, 95% CI [-1.75, 0.554], $t(438) = -1.02$, $p = .310$.

Table 4.7. Results of the Linear Mixed Model Analysis for only VVG Hours and Ostracism Interaction on Aggression (without Dropouts and with Dropouts Combined)

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
(Intercept)	74.253	0.976	72.340	76.166	256	76.08	< .001
VVG Hours*Ostracism	0.005	0.004	-0.003	0.012	433	1.19	0.233

Note: VVG = Violent Video Games.

As it can be seen in the Table 4.7., the result for ostracism as a moderator revealed that, increase in ostracism did not moderate the increase in aggression over time, b = 0.005, SE = 0.004, 95% CI [-0.003, 0.012], $t(433) = -1.19$, $p = .233$.

Table 4.8. Results of the Linear Mixed Model Analysis for only VVG Hours and Competence in VVG Interaction on Aggression (without Dropouts and with Dropouts Combined)

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
(Intercept)	73.851	1.030	71.833	75.870	268	71.725	< .001
VVG Hours*Competence in VVG	0.020	0.018	-0.016	0.055	371	1.076	0.283

Note: VVG = Violent Video Games.

As it can be seen in the Table 4.8., the result for feeling of competence in VVG as a moderator revealed that increase in feeling of competence over time did not moderate the increase in aggression over time, b = 0.020, SE = 0.018, 95% CI [-0.016, 0.055], $t(371) = 1.076$, $p = .283$.

4.2.3. RESULTS FOR THE ANALYSIS OF THE RELATIONSHIP BETWEEN EACH VARIABLE WITH AGGRESSION (ALL IN ONE ANALYSIS)

Table 4.9. Results of the Linear Mixed Model Analysis for the Data without Dropouts and with Dropouts Combined

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
Intercept	74.148	0.984	72.219	76.078	261	75.317	< .001
VVG Hours	0.011	0.012	-0.014	0.035	388	0.853	0.394
Non-VVG Hours	-0.035	0.025	-0.084	0.014	440	-1.386	0.166
Ostracism	0.832	0.165	0.507	1.156	520	5.018	< .001
Competence in VVG	-0.179	0.625	-1.404	1.046	439	-0.286	0.775
VVG Hours*Ostracism	0.005	0.004	-0.003	0.012	429	1.213	0.226
VVG Hours*Competence in VVG	0.017	0.018	-0.018	0.053	367	0.946	0.345

Note: VVG = Violent Video Games.

The linear mixed model analysis for the data without dropouts and with dropouts combined showed that there is not a relationship between the increase in hours spent violent video game playing through time and the increase in aggression through time, b = 0.011, SE = 0.012, 95% CI [-0.014, 0.035], $t(388) = 0.853$, $p = 0.394$. Similarly, there is not a relationship between the increase in hours spent non-violent video game playing through time and the increase in aggression through time, b = -0.035, SE = 0.025, 95% CI [-0.084, 0.014], $t(440) = -1.386$, $p = 0.166$. So, as in the data with dropouts, neither violent gaming nor non-violent gaming hours were found to have a significant relationship with aggression through measurements.

The results for feeling of competence in games as a moderator indicated that increase in feeling of competence in games through time did not moderate the relationship between the increase in hours spent violent video game playing through time and the increase in aggression through time, b = 0.017, SE = 0.018, 95% CI [-0.018, 0.053], $t(367) = 0.946$, $p = 0.345$.

In addition, the results revealed that the increase in ostracism of the participants through time did not moderate the relationship between the increase in hours spent violent video game playing through time and the increase in aggression through time $b = 0.005$, $SE = 0.004$, 95% CI [-0.003, 0.012], $t(429) = 1.213$, $p = 0.226$. Therefore, ostracism was not found to be a moderator in this relationship.

But, the analysis showed that there is a positive relationship between the increase in the ostracism of the participants through time and the increase in aggression through time. $b = 0.832$, $SE = 0.165$, 95% CI [0.507, 1.156], $t(520) = 5.018$, $p < .001$.

4.2.4 THE SEPARATE RESULTS FOR THE FOUR FACTORS OF AGGRESSION

Even though there were no hypotheses or expectations made at the beginning of the current study, the four factors of the Buss-Perry Aggression Scale (Buss & Perry, 1992) were analyzed to see whether there would be different results compared to the analyses conducted with the overall scale. According to the separate results for the analysis of the four factors of the aggression scale, “anger” and “hostility” factors revealed the same results as the analysis of the overall scale. However, the “physical aggression” and “verbal aggression” factors revealed some different results. Since the results for the physical aggression factor and verbal aggression factor has some differences with the overall analysis, their result will be mentioned in this section, while the results for the anger and frustration factors will be mentioned in APPENDIX X as exploratory results.

Table 4.10. Results of the Linear Mixed Model Analysis for the "Physical Aggression" Factor Data (without Dropouts and with Dropouts Combined)

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
Intercept	18.445	0.329	17.798	19.090	268	55.982	< .001
VVG Hours	0.005	0.004	-0.003	0.014	393	1.198	0.231
Non-VVG Hours	-0.018	0.009	-0.035	-0.011	429	-2.090	0.037
Ostracism	0.175	0.058	0.061	0.288	547	3.023	0.003
Competence in VVG	-0.188	0.218	-0.615	0.239	446	-0.863	0.389
VVG Hours*Ostracism	0.003	0.001	-9.73e-5	0.005	451	1.890	0.059
VVG Hours*Competence in VVG	0.007	0.006	-0.006	0.020	398	1.080	0.281

Note: VVG = Violent Video Games.

As it can be seen in the Table 4.10., according to the linear mixed model analysis for the "Physical Aggression" factor's data collected with Buss-Perry Aggression Scale (Buss & Perry, 1992), the only significant predictors of increase in physical aggression over time was increase in ostracism, b = 0.175, SE = 0.058, 95% CI [0.061, 0.288], $t(547) = 3.023$, $p < .05$; and non-VVG hours b = -0.018, SE = 0.008, 95% CI [-0.035, -0.011], $t(429) = -2.090$, $p < .05$. The other factors, which are VVG hours and competence in VVG, did not significantly predict increase in physical aggression over time. Additionally, ostracism and competence in VVG did not moderate the relationship between the increase in VVG hours and increase in physical aggression over time. In sum, the results for the physical aggression factor of the scale revealed almost the same results with the analysis of the overall scale, except for non-VVG hours and aggression relationship over time. While the overall scale showed no significant association between non-VVG hours and aggression over time as expected in the hypotheses, the results of the physical aggression factor showed there was a significant and negative relationship, similar to the result from the cross-sectional correlation analysis which was mentioned at the beginning of the result section. This means that while non-VVG playing hours increased over time, physical aggression decreased over time or vice versa. Since the expectation of the main hypotheses was

to find no significant association between VVG playing and aggression, these findings were surprising. So, even though the expectations for the physical aggression factor were not specifically made at the beginning of the current study, this surprising result was worth mentioning.

Table 4.11. Results of the Linear Mixed Model Analysis for the Verbal Aggression Factor Data (without Dropouts and with Dropouts Combined)

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
Intercept	15.835	0.201	15.408	16.197	268	78.502	<.001
VVG Hours	-0.001	0.003	-0.007	0.005	435	-0.371	0.711
Non-VVG Hours	-0.004	0.006	-0.015	0.007	400	-0.676	0.499
Ostracism	0.063	0.039	-0.014	0.139	550	1.612	0.107
Competence in VVG	0.024	0.153	-0.276	0.323	511	0.156	0.876
VVG Hours*Ostracism	-0.001	0.005	-0.010	0.007	402	-0.319	0.750
VVG Hours*Competence in VVG	-7.69e−4	9.67e-4	-0.003	0.001	490	-0.795	0.427

Note: VVG = Violent Video Games.

As it can be seen in the Table 4.11., according to the linear mixed model analysis for the "Verbal Aggression" factor's data, the results came out as the same with the overall scale, but with a difference of increase in ostracism being not associated with increase in verbal aggression, $b = 0.063$, $SE = 0.039$, 95% CI [-0.014, 0.139], $t(550) = 1.612$, $p = .107$. This result contradicted with both past literature, our hypotheses, and the main results mentioned in the previous sections.

4.3. SUMMARY OF THE FINDINGS

In this study, the moderating role of ostracism and feeling of competence during gameplay on the relationship between violent video game playing and aggression was tested longitudinally. The results for separate analysis of the research variables with aggression individually and all-in-one analysis both revealed the same results. They both indicated that increase in hours of violent and non-violent video game playing did not predict aggression. In addition, increase in feeling of competence in games and

increase in ostracism did not moderate the relationship between increase in hours of violent video game playing and increase in aggression. But increase in ostracism predicted the increase in aggression significantly, which makes ostracism through time the only significant predictor of aggression through time.

According to the results of the analyses, Hypothesis 1, which expects that there will be a relationship between the increase in hours spent violent video game playing and the increase in aggression, was not supported since the results revealed that there was not a relationship between violent video game hours and aggression through time. However, Hypothesis 2, which says that there will be no relationship between the increase in non-violent video game hours and increase in aggression, was supported because the relationship between those two indeed was statistically insignificant. On the other hand, Hypothesis 3, which claimed that ostracism of the participants would be a moderator in the relationship between the increase in violent video gaming hours and the increase in aggression through time, and for higher values of ostracism, the relationship will be stronger, was not supported, since the ostracism through time was not found to be a moderator on the violent gaming hours and aggression. Similarly, the fourth and the last hypothesis was not supported since the hypothesis claimed that feeling of competence in games would be a moderator in the relationship between the increase in violent video game hours and aggression through time and for lower values of feeling of competence in game, the relationship will be stronger, but, the results showed the opposite.

Therefore, the cross-sectional results from the correlation matrix were mostly supported also in the longitudinal context. However, the cross-sectional result of the negative relationship between non-VVG playing and aggression was not present in the overall results of the longitudinal analyses but was present in the analysis of only the physical aggression factor of the aggression scale. The possible explanations of these results will be mentioned in the discussion section later on.

CHAPTER 5
DISCUSSION

5.1. OVERVIEW OF THE CURRENT STUDY AND THE FINDINGS

In this study, the aim was to examine the long-term association between the change in time spent violent video gaming and the change in aggression and whether the feeling of competence in the games and ostracism levels of the players moderate this relationship. To be more specific, it was expected that as time spent violent video gaming increases through time, aggression will also increase through time. It was also expected to find that, for lower values of feeling of competence and higher values of ostracism, the long-term relationship between violent video gaming and aggression will come out to be stronger. To test these expectations, we conducted a correlational study with a longitudinal design and measured young adult violent video gamers' violent video gaming hours, aggression, ostracism, and their feeling of competence in the games they were playing; within six weeks intervals and within three measurements in total. The results showed in the current study that increase in hours of VVG and non-VVG playing did not predict the increase in aggression through measurements. In addition, increase in feeling of competence in games and increase in ostracism through time did not moderate the relationship between the increase in hours of VVG playing and increase in aggression through time. However, an exploratory result that was not specifically mentioned in the hypotheses showed that the increase in ostracism predicted the increase in aggression significantly, which makes ostracism through time the only significant predictor for aggression through time. It is also important to note that when the same analysis was conducted to explore the increase in each variable's relationship with increase in aggression, but separately for each variable this time, showed the same results with the all-in-one analysis. However, when the same analysis was conducted for the four factors of the aggression scale, there were few differences compared to the results of the data of the overall scale. Specifically, the results for the "verbal aggression" and "physical aggression" did not completely meet the results of the main analysis since "verbal aggression" was not

found to be significantly associated with ostracism as in the main analysis. Also, "physical aggression" was found to be negatively associated with non-VVG hours, which again contradicted the previous main analysis. Thus, the non-VVG finding from the analysis for "physical aggression" was actually consistent with the cross-sectional analysis of the first measurement that suggested a significant and negative correlation between non-VVG hours and aggression in the first measurement, which will be discussed in the next section.

5.2. INTERPRETATION OF THE FINDINGS

As it can be seen in the Hypothesis 1 of the current study, we expected to find a relationship between increase in hours spent VVG playing and increase in aggression of the players through the measurements. This expectation stemmed from the theories/models about aggression and previous VVG and aggression literature. The most relevant works to consider while forming the Hypothesis 1 were SLT (Bandura, 1977), GAM (Anderson & Bushman, 2002) and number of previously mentioned empirical studies which found a VVG and aggression relationship (e.g., Anderson et al., 2010, Anderson & Dill, 2000; Bushman, 1995; Bushman & Baumeister, 1998; Carnagey et al., 2007; Carnagey & Anderson, 2005; DeLisi et al., 2012; Krahe & Möller, 2004; Meng et al., 2017). Specifically, we highlighted Carnagey et al. (2007)'s findings which showed that even 20 minutes of VVG play is enough for participants to get desensitized to violence and getting inclined to show aggression, and therefore long-term consequences of VVG would be much more detrimental and apparent. This was in line with Anderson and Bushman (2002)'s claims in GAM, as they supported that long-term gaming would lead to much more desensitization effects compared to short-term gaming, and this produces more significant aggressive outcomes. Considering all these, we would also expect to see such an apparent relationship due to the long-term design of our study. That is why we based our Hypothesis 1 on the works that found VVG and aggression relationship. However, the result for Hypothesis 1 did not come out as was expected, and it showed that the increase in hours of VVG and increase in aggression through time were not related to each other. This result was not consistent with the previous literature that we based our first hypothesis (Anderson et al., 2010, Anderson & Dill, 2000; Bushman, 1995; Bushman & Baumeister, 1998; Carnagey et al., 2007; Carnagey & Anderson, 2005; DeLisi et al., 2012; Krahe & Möller, 2004; Meng et al., 2017; Prescott et al., 2018) but was consistent with the few

numbers of studies that did not find any significant relationship between VVG and aggression (e.g., Ferguson, 2007; Ferguson & Kilburn, 2009; Ferguson & Rueda, 2010; Hilgard et al., 2019; Przybylski & Weinstein, 2019) and this result's possible explanations could be understood by discussing these studies.

For example, in the study of DeLisi et al. (2012), they analyzed juvenile delinquents for their violent video gaming status, and their analysis showed that preferring and playing VVGs was correlated with violent and delinquent behavior. They also found that psychopathy also predicts violent and delinquent behavior. This brings the idea that, since the current study involves a sample that is not specifically delinquents and there is no data that there were delinquent participants or not, maybe controlling this delinquency factor would bring different results. Since DeLisi et al. (2012) highlighted that psychopathy was also a significant predictor of delinquent behavior, the possibility that the sample of the current study has generally fewer psychopathy traits could lead to insignificant results, indirectly

In addition, another possible explanation for the Hypothesis 1 not coming out as we expected can be made by the meta-analysis of Prescott et al. (2018), which actually did claim a significant long-term association between VVG and aggression after reviewing many past studies as we expected. But this meta-analysis also suggested that in the longitudinal studies about VVG and aggression relationship, as the time passes between each measurement decreases, the chance of getting significant results for the association between these two factors gets lower, which was also consistent with what Hull et al. (2014) found. In detail, Prescott et al. (2018) claimed that, compared to the longitudinal studies that put more than one-year intervals between their measurements, studies that put less than one year, like our current study, had less strong effects. This claim could be related to GAM (Anderson & Bushman, 2002)'s and Carnagey et al. (2007)'s claims that playing VVG for longer and continuous periods of time would lead to facing more desensitization effect, and this could lead to a more prominent aggression to show up in the long run. So, the reason for the inconsistency between our first hypothesis and our result could be due to the possibility that the time lag between our measurements was maybe not long enough for the potential associations to show up due to the rather short time lags between the measurements. Therefore, having longer time intervals that are longer than six weeks between the measurements could have led to supporting results for the Hypothesis 1.

Prescott et al. (2018)'s meta-analysis also highlighted the potential effects of culture on the long-term relationship between VVG and aggression, which should be discussed about our result for Hypothesis 1. To be clearer, in this meta-analysis, sample with White participants had the strongest long-term effect between VVG and aggression, while the sample with Asian participants had average but significant effects, and the sample with Hispanic participants had the lowest and non-significant effects. This outcome can be better understood with Anderson et al. (2010)'s meta-analysis, which yielded that culture moderates the relationship between VVG and getting desensitized to violence and a decrease in empathy. Specifically, they claimed that VVG playing led Western samples to have a stronger decrease in empathy and a stronger increase in getting desensitized to violence compared to the Eastern samples. According to Prescott et al. (2018), this can explain their finding that culture being a moderating factor on the VVG-aggression relationship due to the influence of desensitization and empathy on aggressive outcomes, which are the factors that culture also influences. So this means that there is a possibility that the cultural background of a sample can influence the aggressive outcomes as a result of VVG playing. This situation can be linked to the current study. For instance, the sample of the current study was conducted in Turkey, and according to Sozen et al. (2020), Turkish culture both shows aspects of Eastern/collectivistic cultures (e.g. being society-centered, valuing spirituality and being more giving) and aspects of Western/individualistic cultures (e.g. giving importance to logic, rationality, and materials) (Göregenli, 1997; Kılınç & Granello, 2003; Sunar & Fişek Okman, 2004). So, the previously mentioned potential explanations about the differences between Eastern and Western cultures can both apply or not in our case. Therefore, predicting the influence of culture on the VVG-aggression relationship can be hard when they are conducted in cultures that are a mix of both Eastern and Western characteristics, like Turkish culture. However, considering that Eastern cultures generally having lower effects of VVG-aggression relationship due to their insusceptibility to get desensitized and less empathetic towards violence, there is a possibility for our study with Turkish sample to have similar issues, maybe because all participants were more from the individualistic side. However, there is no way of knowing if that was the case or not because no prior specific data were collected about the individualistic vs. collectivistic cultural background. Hence, in our case, the reason for Hypothesis 1 not coming out as expected could have a chance to be related to the individualistic vs. collectivistic

cultural background of our sample, but this possibility cannot be exact. The further implications about culture will also be discussed in the limitations section later.

So, besides the studies with contradictory interpretations, our result for Hypothesis 1 was in line with some of the past studies' findings (Ferguson, 2007; Ferguson & Kilburn, 2009; Ferguson & Rueda, 2010; Ferguson & Wang, 2019; Hilgard et al., 2019; Kühn et al., 2018; Przybylski & Weinstein, 2019). For instance, Kühn et al. (2018) found no association between two months of continuous VVG playing and aggression. The consistency between this result and our result could be related to the age similarity of the two studies. In detail, their sample was also an adult sample like ours, and the majority of their sample was college students, again, like ours. Therefore, the similarity of age groups could be related to yielding similar results. The reason for not having significant results for the long-term association between VVG and aggression with adult sample can be supported by the meta-analysis of Burkhardt and Lenhard (2022), which examined the age factor in the long-term association between VVG and aggression. They found that the effects of the relationship between long-term VVG and aggression were declining as the mean age of the samples of the studies decreased, and the effects were at their lowest for the mean age group of around 23, which is very close to our sample's mean age, which was around 21.5. Therefore, our inability to find a significant relationship between the increase in VVG and increase aggression through measurement might be due to the nature of our sample due to their age group.

Additionally, another study which also revealed similar results to ours was Ferguson and Wang (2019). They found in their long-term study that there was no relationship between VVG and aggression, which was a finding that supports some previous meta-analysis that claims the detrimental effects of VVG was overestimated due to the methodological limitations in the past literature (Ferguson, 2007; Ferguson & Kilburn, 2009). Even though their methodological approach was criticized by Anderson et al. (2010), their suggestions were currently supported by Przybylski and Weinstein (2019)'s up-to-date study, which is one of the earliest examples of studies that use preregistration. In this study, they found no relationship between VVG and aggression, again. Przybylski and Weinstein (2019)'s findings were very important due to their preregistered approach, which enabled a more reliable hypothesis testing compared to the past non- preregistered studies about VVG and aggression. Therefore, our inability

to see a relationship between VVG and aggression might be understandable since the past literature that found such relationships have a chance to be biased and not transparent which led them to find significant results for VVG and aggression relationship (Ferguson, 2007; Ferguson & Kilburn, 2009; Przybylski & Weinstein, 2019; Simmons et al., 2021; Van't Veer & Giner-Sorolla, 2016).

For our second hypothesis, we tested if there would be a relationship between the increase in hours of non-VVG playing and increase in aggression through measurements and expected to find a non-significant relationship. The results revealed that Hypothesis 2 was supported since there was no relationship between the increase in hours of non-VVG playing and increase in aggression, which was consistent with Willoughby et al. (2012). At this point, it is important to remind that this hypothesis was formed to check whether the relationship between increase in VVG playing and increase in aggression was true and special only for VVG playing and not also for non-VVG playing, as also conducted in Willoughby et al. (2012). However, since our result for Hypothesis 1 was not supported as the finding yielded that there was not a relationship between the increase in hours of VVG and increase in aggression through time, our result for the second hypothesis was not meaningful in our context, but at least still gave an idea about non-VVG playing not being a significant factor for aggression, as expected.

On the other hand, linked with Hypothesis 2, the possible explanations for both cross-sectional correlation analysis (which yielded a non-VVG playing and aggression association) and interesting exploratory finding that there is an association between the increase in non-VVG playing and physical aggression can be made by Liu et al. (2015)' study. In this study, they found that playing a prosocial video game, in which characters rescue the people in need, was associated with less aggressive behavior (since they chose to give less intense noise to an ostensible loser of the game). This study can explain the result between non-VVG and physical aggression. In the current study, the participants were asked to enter the average hours of their non-VVG playing and were given an instruction that non-VVG can be defined as the games in which there was no physical harm applied to others via guns or sharp objects, and they should fill in the form according to this instruction. Since this instruction can also comprise prosocial games that involve helping others without using force or violence, the significant association between the increase in non-VVG playing and aggression can

be meaningful due to the current study's participants' potential past preference for prosocial non-VVGs. However, in the current study, the participants were not given any specific games to play due to the correlational design of the current study. Rather, they were asked to enter the hours of their preferred gameplay that fits the given non-VVG criteria. Therefore, there would be no way of knowing whether they have really played prosocial non-VVGs or neutral non-VVG games in the current study. This prevents us from concluding that it is a definite explanation for our exploratory result. Hence, if future research would be willing to specifically study prosocial non-VVG games by asking questions specific to prosocial non-VVGs, or even VVGs, this could be beneficial for the aggression literature to have a clear understanding about the topic.

For our third hypothesis, we tested to see whether there would be a moderating effect of participants' increase in ostracism on the relationship between increase in VVG hours and increase in aggression through time. The result for this hypothesis yielded an inconsistency with what we expected to find since the result showed that increase in ostracism was not a significant moderator of the relationship between increase in VVG and increase in aggression. Thus, our results contradicted with Gabbiadini and Riva (2017)'s study, even though they had a very similar research topic with our testing for Hypothesis 4. Such that their hypothesis was almost the same as our fourth hypothesis: when ostracism and VVG come together, this will lead to higher aggressive outcomes compared to only VVG exposure. However, our findings did not meet with theirs, as was said. Therefore, the inconsistency between our finding and their finding should be attributed to some different factors between the two studies. For instance, even though this study's concern was very similar to what we tested for our fourth hypothesis, the method they used was different: they used a short-term experimental design, while we used a long-term correlational design. Hence, the procedure and measures were also different. They used, for example, the Voodoo doll task (DeWall et al., 2013) to measure symbolic aggression, while we used a scale that measures real-life aggressiveness (Buss & Perry, 1992; Madran, 2012). In addition, due to their experimental approach, they manipulated the ostracism of the participants during the study by making them play a game called Cyberball (Williams et al., 20000), in which they were ostracized on purpose; while we measured our participants' ostracism with a scale that measures real-life ostracism experiences (Akın et al., 2016; Gilman et al., 2013). So, the explanation for the inconsistencies of the

results could be done by referencing those methodological differences between the two studies. At this point, it is also worth mentioning that Gabbiadini and Riva (2017) explained that future studies should consider studying this topic with a long-term correlational approach due to the possibility for their short ostracism manipulation is not enough for making generalized explanations for this relationship. Our study applied this consideration and supported their future-work suggestions, and showed that studying ostracism as a moderating factor for VVG and aggression longitudinally could really reveal different results than studies with experimental design.

In the last hypothesis of the current study, it was expected to find that feeling of competence in VVGs will moderate the relationship between the increase in hours spent VVG playing and the increase in aggression, and for lower values of feelings of competence in the games, the relationship between the increase in VVG hours and increase in aggression will be stronger. However, the result of the test for Hypothesis 3 showed a contradiction with the expectation: feeling of competence in games was not a moderator between the increase of VVG playing hours and increase in aggression. Therefore, this result was inconsistent with the previous theories and research that we took as a reference to form our third hypothesis. For example, our result for the third hypothesis conflicted with the SDT (Ryan & Deci, 2000) and frustration-aggression hypothesis (Dollard et al., 1939) and a study which tested this theory (Przybylski et al., 2014) since this theory and study both highlighted the importance of thwarting the need for competence on developing potential aggressive outcomes. However, they only conducted a short-term VVG play, and not long-term, like ours. So, this result probably was not generalizable to long-term moderating association of competence on VVG and aggression in the first place, contrary to what we thought, which resulted in the inconsistency between the results of this study and our result for Hypothesis 4.

In addition, it is also important to mention that, when we checked the relationship between the increase in aggression and increase in ostracism solely, we saw that increase in ostracism did predict increase in aggression through time. Even though this expectation was not in our hypothesis, we still were not surprised for this relationship to come out as significant since we based our third hypothesis on the high possibility of ostracism and aggression being related, considering past theoretical and empirical literature (Chester & DeWall, 2017; Rajchert & Winiewski, 2016; Ryan & Deci, 2000;

Twenge et al., 2001; Williams, 2009). For instance, this exploratory finding was consistent with SDT (Ryan & Deci, 2000) and the temporal need-threat model of ostracism (Williams, 2009), which were in line with this exploratory result since they supported that being excluded thwarts people's needs and trigger coping mechanisms which lead people to show more aggression. Therefore, this result met our expectation even though it was not a hypothesized expectation. However, the analyses for "verbal aggression" factor of the aggression scale revealed different results and showed that ostracism was not linked with aggression over time. This brings the idea that verbal aggression can have different mechanisms linked with ostracism compared to the other three factors that need to be explored.

5.3. CONTRIBUTIONS OF THE CURRENT STUDY

This thesis contributed to the VVG and aggression literature in some points that are worth mentioning. For example, one of the most important contributions was that this specific topic and relationship has never been studied before, as far as we are concerned. Even though there were similar studies that overlap with our study in some points, there were not any studies that checked for a specific long-term association between increase in VVG and increase in aggression and the possible moderating link of potential moderators like increase in ostracism and competence on this relationship (e.g., Gabbiadini & Riva, 2017; Möller & Krahe, 2009; Przybylski et al., 2014; Willoughby et al., 2012).

Speaking of the potential moderators, it is worth mentioning that Przybylski et al. (2014) highlighted the importance of examining ostracism and competence in video game and aggression literature for the future research to fill the gaps in the literature. Since the current study examined ostracism and competence as a moderator based on this suggestion, we could potentially say that our research added to the VVG and aggression literature by testing ostracism and competence as a potential moderator, as encouraged in the past literature (Anderson & Dill, 2000; Gabbiadini & Riva, 2017; Przybylski et al., 2014; Przybylski & Weinstein, 2019).

Specifically for ostracism, as we mentioned in the discussion section, our study revealed that studying ostracism as a moderating factor for VVG and aggression longitudinally could show different results than studies with an experimental design (Gabbiadini & Riva, 2017). Since Gabbiadini and Riva (2017) found a moderating

effect of ostracism on the relationship between VVG and aggression, but warned that these findings could not be generalized into long-term and non-experimental setting and highlighted the need for conducting this type of research on this specific relationship, this thesis contributed to this need in the literature and showed that increase in ostracism was not a significant moderator of the increase in VVG and increase in aggression relationship, in a longitudinal setting.

Another contribution could be that since VVG and aggression literature cumulated mostly in the Western countries (e.g., Gabbiadini & Riva, 2017; Möller & Krahe, 2009; Przybylski et al., 2014; Willoughby et al., 2012), and little is known in the literature on this topic about non-Eastern countries (e.g., Anderson et al., 2008; Ferguson & Wang, 2019); our study with Turkish sample can provide a data for improving limited non-Western studies in the literature.

Another point that should be emphasized about the contributions of the current study is the issue of preregistration. As it was mentioned, Simmons et al. (2021) and Van't Veer and Giner-Sorolla (2016) suggested that performing preregistration is important to eliminate possible overestimation or underestimation of the results and transparency problems due to biases. Since Przybylski and Weinstein (2019) supported this idea specifically for VVG and aggression studies, we also chose to perform preregistration. This was very important due to the past conflicts in VVG and aggression research since it led to clearer results. Therefore, our thesis tried to enrich the VVG and aggression literature by involving a study with preregistration.

5.4. LIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FUTURE RESEARCH

Even though the current study contributed to number of aspects, as explained in the previous section, facing some limitations was inevitable, of course. One of the possible limitations of our study was the mean age of the sample. In order to be clearer, it would be better to understand Burkhardt and Lenhard (2022)'s study. As it was mentioned before, they found in their meta-analysis that as the mean age of a sample decreases, the long-term effects between VVG and aggression also decrease. Specifically, while the mean age of around 13 or 14 had the strongest effects, the mean age of around 23 had the weakest effects of VVG and aggression relationship. Since our study's sample had a mean age of around 21.5, our expectation to find a significant VVG and

aggression relationship should not have been strong enough. Therefore, future researchers are highly encouraged to be cautious about the age factor. They can analyze age factor as a moderator, or work with different age groups, for example, experimentally on VVG and aggression studies.

In addition, the other potential limitation can be the self-report approach of our study. Even though this approach is a highly preferred one in VVG and aggression research, it still has its own limitations. For instance, relevant to our case, according to Lance and Vandenberg (2009), while self-report measurements do not have very serious limitations when the measurement demands some demographic variables like age or sex; it may be inclined to lead to limitations when the self-report measure demands data that should be recalled by deep retrospective thinking. Since our study contained recalled-type self-report measures that are probably not so easy to remember, like average hours of VVG playing hours, we probably got exposed to this limitation of self-report studies. Therefore, our suggestion for future work at this point might be that if they want to use self-report measures, then they should try to ask the questions as simple and easy-to-remember as possible. However, using an experimental method would directly solve this potential limitation from the root, of course.

Another possible limitation linked to the self-report approach of the current study can be about social desirability problem, which is a generally discussed potential problem in self-report studies (Lance & Vandenberg, 2009). According to Ganster et al. (1983), social desirability can be present in self-report studies since some individuals can potentially give overestimated or underestimated answers to make socially appropriate or favorable impressions about what is being measured. This can be the case for the current study since all the measures of this study were self-report-type and were open to social desirability. For example, the "hours of VVG playing" measure could be open to social desirability problem since some participants could want to give the impression that their violent video gaming hours are socially appropriate while, in reality, the hours are very high, and not in the socially accepted norms, for example. Also, the same can apply to the "aggression", "ostracism", and "feeling of competence in games" measures since the participants could want to give answers as if they had socially acceptable levels of aggression, ostracism, and game competence. However, according to Joinson (1999), the questionnaires that were conducted with the anonymity of the participants had less social desirability problem, especially when

they were conducted via the internet rather than face-to-face. Therefore, since the current study was an internet-based study and promised in the given informed consent form (APPENDIX I) that the participants' answers would be held private and anonymous, the chances of them giving underestimated or overestimated answers to the measures could be decreased. But, the fact that the current study asked participants their e-mail addresses (to be able to reach them again for the upcoming measurements), their feelings of anonymity might have been disrupted, which could potentially increase their chances of giving answers to social desirability problem, again. Therefore, the future studies should consider the importance of the anonymity of the participants to be able to avoid social desirability problem. Future longitudinal studies should consider reaching the participants for upcoming measurements with more anonymity and maybe should not consider asking for e-mail addresses of the participants and instead create some alternative and more anonymous ways to reach the participants.

Our next potential limitation could be the current study's time lags between the measurements. According to Prescott et al. (2018)'s meta-analysis, in longitudinal studies, longer time lags between measurements (one year or more) bring stronger effects of VVG and aggression association compared to shorter time lags (less than one year). Since our time lags between the three measurements were only six weeks, this could be a potential limitation for us to get real and reliable results on VVG and aggression relationship. Even though we did not have a chance to have longer time lags, for example, one year, since this study was a thesis and had a time limit, future research should try to conduct long-term research with longer time lags, preferably longer than one year.

Also, considering DeLisi et al. (2012)'s findings that psychopathy and violent video gaming are linked with violence and delinquency, maybe we should have considered measuring participants' psychopathy traits or delinquency status and comparing the participants with more psychopathy traits and less psychopathy traits, or delinquents or non-delinquents. This could potentially show a difference in their VVG playing hours and maybe significant results. According to DeLisi et al. (2012), exploring psychopathy and delinquency in VVG research, especially longitudinally, could be very beneficial for criminology research and for VVG research. Therefore, even if we did not consider that at the beginning, which could be a possible limitation of the

current study, the future research should consider exploring delinquency and psychopathy in VVG research, especially in a longitudinal context.

In addition, another factor that should be further explored in future research is, feeling of autonomy in the games. This was a potential limitation for the current study since we did consider the two needs of SDT (Deci & Ryan, 2000), which were "competence" and "relatedness" as research variables, but we did not consider the need for "autonomy". However, the "autonomy" need of SDT (Deci & Ryan, 2000) could also be related to violent video game and aggression literature since feeling of autonomy is linked with well-being (Ryan et al, 2006), which is a factor that has a negative link between aggression (Kaur, 2018). Therefore, as in "competence" and "relatedness" needs of SDT (Ryan & Deci, 2000), "autonomy" can also be worth exploring in VVG and aggression research, for example, as a moderator, due to its link to aggression. So, further research should consider studying about the "autonomy" need of SDT (Ryan & Deci, 2000) on VVG and aggression research, as Przybylski et al. (2014) also suggested.

Also, the previously mentioned topic of culture should also be considered as a future research variable in VVG-aggression research, especially in the cultures that have mixed characteristics of both individualistic and collectivistic sides, like Turkey. Because, as it was mentioned before, culture can influence the VVG-aggression relationship with its direct link between aggression. For instance, while Eastern people are less prone to get desensitized to violence, Western people get desensitized easier, which influences aggressive responses. However, since it is not clear whether Turkish culture is an individualistic or collectivistic culture, it is hard to make a comment about the cultural influences in VVG-aggression research (Göregenli, 1997; Kılınç & Granello, 2003; Sunar & Fişek Okman, 2004). However, using a demographic questionnaire about the participants' inclinations towards individualist vs collectivistic cultures might have been a good idea for the current study, which is a limitation of this study. So, further research should collect cultural background data and compare the two groups with different inclinations.

Finally, we can say that the subject of feeling of competence in games probably needs more attention. Such that, Przybylski et al. (2014)'s short-term study on competence in games and aggression might not be generalizable to long-term studies when considering feeling of competence in the games as a factor for aggression. We also

faced this issue in our study when we formed our hypothesis based on this study's findings. But their findings were probably only applicable for short-term contexts, but not long-term contexts like ours, which eventually led to inconsistency with our findings. This brings another limitation to our study since we were unable to notice this potential generalizability problem while forming our hypothesis. Therefore, future research should take this into consideration and form their hypothesis accordingly.

REFERENCES

Akın, A., Uysal, R., & Akın, Ü. (2016). Ergenler İçin Ostrasizm (Sosyal Dışlanma) Ölçeği'nin Türkçe'ye uyarlanması. *Kastamonu Eğitim Dergisi, 24*(2), pp. 895-904.

Anderson, C. A. (1997). Effects of violent movies and trait hostility on hostile feelings and aggressive thoughts. *Aggressive Behavior, 23*, pp. 161-178.

Anderson, C. A. (2004). An update on the effects of violent video games. *Journal of Adolescence, 27*, pp. 113–122.

Anderson, C. A., & Bushman, B. J. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. *Psychological Science, 12*, pp. 353–359.

Anderson, C. A., & Bushman, B. J. (2002). Human aggression. *Annual Review of Psychology, 53*(1), pp. 27–51. doi: 10.1146/annurev.psych.53.100901.135231

Anderson, C. A., & Dill, K. E. (2000). Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life. *Journal of Personality and Social Psychology, 78*(4), p. 772.

Anderson, C. A., Anderson, K. B., & Deuser, W. E. (1996). Examining an affective aggression framework: Weapon and temperature effects on aggressive thoughts, affect, and attitudes. *Personality and Social Psychology Bulletin, 22*, pp. 366-376.

Anderson, C. A., Berkowitz, L., Donnerstein, E., Huesmann, L. R., Johnson, J. D., Linz, D., … Wartella, E. (2003). The influence of media violence on youth. *Psychological Science in the Public Interest, 4*(3), pp. 81–110. doi:10.1111/j.1529-1006.2003.pspi_1433.x

Anderson, C. A., Carnagey, N. L., Flanagan, M., Benjamin, A. J., Eubanks, J., & Valentine, J. C. (2004). Violent video games: Specific effects of violent content on aggressive thoughts and behavior. *Advances in Experimental Social Psychology, 36,* pp. 199–249.

Anderson, C. A., Deuser, W. E., & DeNeve, K. M. (1995). Hot temperatures, hostile affect, hostile cognition, and arousal: Tests of a general model of affective aggression. *Personality and Social Psychology Bulletin, 21,* pp. 434-448.

Anderson, C. A., Gentile, D. A., & Buckley, K. E. (2007). *Violent video game effects on children and adolescents: Theory, research, and public policy.* Oxford University Press. doi.org/10.1093/acprof:oso/9780195309836.001.0001

Anderson, C. A., Sakamoto, A., Gentile, D. A., Ihori, N., Shibuya, A., Yukawa, S., … Kobayashi, K. (2008). Longitudinal effects of violent video games on aggression in Japan and the United States. *Pediatrics, 122*(5), pp. 1067–1072. doi:10.1542/peds.2008-1425

Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., … Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in Eastern and Western countries: A meta-analytic review. *Psychological Bulletin, 136*(2), pp. 151–173. doi:10.1037/a0018251

Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, N.J.: Prentice Hall.

Bandura, A., Ross, D., & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *The Journal of Abnormal and Social Psychology, 63*(3), pp. 575–582. doi.org/10.1037/h0045925

Bandura, A., Ross, D., & Ross, S. A. (1963). Imitation of film-mediated aggressive models. *Journal of Abnormal and Social Psychology, 66*(1), pp. 3-11. doi.org/10.1037/h0048687

Barlett, C., Branch, O., Rodeheffer, C., & Harris, R. (2009). How long do the short-term violent video game effects last? *Aggressive Behavior, 35*, pp. 225–236.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), pp. 497–529. doi:10.1037/0033-2909.117.3.497

Bensley, L., & Van Eenwyk, J. (2001). Video games and real-life aggression: review of the literature. *Journal of Adolescent Health. 29*(4), pp. 244–257. Elsevier BV. doi.org/10.1016/s1054-139x(01)00239-7i

Berkowitz L. (1989). Frustration-aggression hypothesis: examination and reformulation. *Psychological Bulletin*. *106*. pp. 59–73

Berkowitz L. (1990). On the formation and regulation of anger and aggression: a cognitive-neoassociationistic analysis. *American Psychologist. 45*(4). pp. 494–503. doi:10.1037//0003-066x.45.4.494

Berkowitz L. (1993). Pain and aggression: some findings and implications. *Motivation and Emotion. 17*. pp. 277–93

Bozkuş, O. (2021). Şiddet içerikli video oyunları ve saldırganlık ilişkisinin gözden geçirilmesi. *Gelişim ve Psikoloji Dergisi. 2*(3), pp. 75-79. doi.org/10.51503/gpd.791346.

Breuer, J., Vogelgesang, J., Quandt, T., & Festl, R. (2015). Violent video games and physical aggression: Evidence for a selection effect among adolescents. *Psychology of Popular Media Culture, 4*(4), pp. 305–328. doi:10.1037/ppm0000035

Burkhardt, J., & Lenhard, W. (2022) A meta-analysis on the longitudinal, age-dependent effects of violent video games on aggression, *Media Psychology, 25*(3), pp. 499-512. doi: 10.1080/15213269.2021.1980729

Bushman, B. J. (1995). Moderating role of trait aggressiveness in the effects of violent media on aggression. *Journal of Personality and Social Psychology, 69*(5), pp. 950-960. doi: 10.1037//0022-3514.69.5.950

Bushman, B. J., & Baumeister, R. F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: Does self-love or self-hate lead to violence? *Journal of Personality and Social Psychology, 75*(1), pp. 219–229. doi.org/10.1037/0022-3514.75.1.219

Buss, A. H., & Perry, M. (1992). The Aggression Questionnaire. *Journal of Personality and Social Psychology, 63*(3), pp. 452–459. doi.org/10.1037/0022-3514.63.3.452

Carnagey, N. L., & Anderson, C. A. (2005). The effects of reward and punishment in violent video games on aggressive affect, cognition, and behavior. *Psychological Science, 16*(11), pp. 882–889. doi:10.1111/j.1467-9280.2005.01632.x

Carnagey, N. L., Anderson, C. A., & Bushman, B. J. (2007). The effect of video game violence on physiological desensitization to real-life violence. *Journal of Experimental Social Psychology, 43*(3), pp. 489–496. doi.org/10.1016/j.jesp.2006.05.003

Chester, D. S., & DeWall, C. N. (2017). Combating the sting of rejection with the pleasure of revenge: A new look at how emotion shapes aggression. *Journal of Personality and Social Psychology, 112*(3), pp. 413–430. doi.org/10.1037/pspi0000080

Cooper, J., & Mackie, D. (1986). Video games and aggression in children. *Journal of Applied Social Psychology, 16*(8), pp. 726-744. doi:10.1111/j.1559-1816.1986.tb01755.x

Cosme, G. (2021). A social learning understanding of violence. *Academia Letters*. doi.org/10.20935/al1019

DeLisi, M., Vaughn, M.G., Gentile, D.A., Anderson, C.A., & Shook, J.J. (2012). Violent video games, delinquency, and youth violence: New evidence. *Youth Violence and Juvenile Justice 11*(2), pp. 132–142. doi:10.1177/1541204012460874

Dennissen, J. J. A., Asendorpf, J. B., & Van Aken, M. A. G. (2007). Childhood personality predicts long-term trajectories of shyness and aggressiveness in the context of demographic transitions in emerging adulthood. *Journal of Personality, 76*(1), pp. 67–100. doi:10.1111/j.1467-6494.2007.00480.x

DeWall, C. N., Finkel, E. J., Lambert, N. M., Slotter, E. B., Bodenhausen, G. V., Pond, R. S., … Fincham, F. D. (2013). The voodoo doll task: Introducing and validating a novel method for studying aggressive inclinations. *Aggressive Behavior*, *39*. doi:10.1002/ab.21496

Dill, K. E., & Dill, J. C. (1998). Video game violence: A review of the empirical literature. *Aggression and Violent Behavior, 3*(4), 407–428. doi.org/10.1016/S1359-1789(97)00001-3

Dollard, J., Miller, N. E., Doob, L. W., Mowrer, O. H., & Sears, R. R. (1939). *Frustration and aggression*. Yale University Press. https://doi.org/10.1037/10022-000

Dominick, J. R. (1984). Videogames, television violence, and aggression in teenagers. *Journal of Communication, 34(*2), pp. 136–147. doi:10.1111/j.1460-2466.1984.tb02165.x

Ferguson, C. J. (2007). Evidence for publication bias in video game violence effects literature: A meta-analytic review. *Aggression and Violent Behavior, 12*(4), pp.

470–482. doi:10.1016/j.avb.2007.01.001

Ferguson, C. J., & Kilburn, J. (2009). The public health risks of media violence: A meta-analytic review. *The Journal of Pediatrics, 154*(5), pp. 759–763. doi:10.1016/j.jpeds.2008.11.033

Ferguson, C. J., & Rueda, S. M. (2010). The Hitman study: Violent video game exposure effects on aggressive behavior, hostile feelings, and depression. *European Psychologist, 15*(2), pp. 99–108. doi.org/10.1027/1016-9040/a000010

Ferguson, C. J., & Wang, J. C. K. (2019). Aggressive video games are not a risk factor for future aggression in youth: A longitudinal study. *Journal of Youth and Adolescence*, *48*, pp. 1439–1451. doi:10.1007/s10964-019-01069-0

Fischer, P., Kastenmuler, A., & Greitemeyer, T. (2010). Media violence and the self: The impact of personalized gaming characters in aggressive video games on aggressive behavior. *Journal of Experimental Social Psychology, 46*, pp. 192–105. doi:10.1016/J.JESP.2009.06.010

Freedman, J. (2002). *Media violence and its effect on aggression: Assessing the scientific evidence*. University of Toronto Press.

Fryling, M. J., Johnston, C., & Hayes, L. J. (2011). Understanding observational learning: An interbehavioral approach. *The Analysis of Verbal Behavior, 27*(1), pp. 191–203. doi:10.1007/bf03393102

Gabbiadini, A., & Riva, P. (2017). The lone gamer: Social exclusion predicts violent video game preferences and fuels aggressive inclinations in adolescent players. *Aggressive Behavior, 44*(2), pp. 113–124. doi:10.1002/ab.21735

Galambos, N. L., & Krahn, H. J. (2008). Depression and anger trajectories during the transition to adulthood. *Journal of Marriage and Family, 70*(1), pp. 15–27.

doi:10.1111/j.1741-3737.2007.00458.x

Ganster, D. C., Hennessey, H. W., & Luthans, F. (1983). Social Desirability Response Effects: Three Alternative Models. *Academy of Management Journal, 26*(2), 321 – 331. doi:10.2307/255979

Gentile, D. A., Choo, H., Liau, A., Sim, T., Li, D., Fung, D., & Khoo, A. (2011). Pathological video game use among youths: a two-year longitudinal study. *Pediatrics, 127*(2), pp. 319-329. doi:10.1542/peds.2010-1353

Gibb, G. D., Bailey, J. R., Lambirth, T. T., & Wilson, W. P. (1983). Personality differences between high and low electronic video game users. *The Journal of Psychology, 114*(2), pp. 159–165. doi:10.1080/00223980.1983.9915409

Gilman, R., Carter-Sowell A., DeWall, N., Adams, R., & Carboni I. (2013). Validation of the Ostracism Experiences Scale for adolescents. *Psychological Assessment, 25*(2), pp. 319-330.

Greitemeyer, T., & Sagioglou, C. (2017). The longitudinal relationship between everyday sadism and the amount of violent video game play. *Personality and Individual Differences, 104*, pp. 238–242. doi:10.1016/j.paid.2016.08.021

Göregenli, M. (1997). Individualist-collectivist tendencies in a Turkish sample. *Journal of Cross-Cultural Psychology, 28*(6), pp. 787–794

Gunter, B. (2016). *Does playing video games make players more violent?* (1st ed.). Palgrave Macmillan..

Hanna, K. M., Scott, L. L., & Schmidt, K. K. (2014). Retention strategies in longitudinal studies with emerging adults. *Clinical Nurse Specialist, 28*(1), pp. 41–45. doi:10.1097/nur.0000000000000020

Hilgard, J., Engelhardt, C. R., Rouder, J. N., Segert, I. L., & Bartholow, B. D. (2019). Null effects of game violence, game difficulty, and 2D:4D digit ratio on

aggressive behavior. *Psychological Science, 30*(4), pp. 606–616. doi:10.1177/0956797619829688

Hollingdale J, Greitemeyer T (2014) The effect of online violent video games on levels of aggression. *PLoS ONE 9*(11): e111790. doi:10.1371/journal.pone.0111790

Huesmann, L. R. (1986). Psychological processes promoting the relation between exposure to media violence and aggressive behavior by the viewer. *Journal of Social Issues, 42*(3), pp. 125–139. doi:10.1111/j.1540-4560.1986.tb00246.x

Huesmann, L. R. (1998). The role of social information processing and cognitive schema in the acquisition and maintenance of habitual aggressive behavior. *Human Aggression*, pp. 73–109. doi:10.1016/b978-012278805-5/50005-5

Hull, J. G., Brunelle, T. J., Prescott, A. T., & Sargent, J. D. (2014). A longitudinal study of risk-glorifying video games and behavioral deviance. *Journal of Personality and Social Psychology*, *107*(2), pp. 300–325. doi:10.1037/a0036058

Irwin, A. R., & Gross, A. M. (1995). Cognitive tempo, violent video games, and aggressive behavior in young boys. *Journal of Family Violence*, *10*, pp. 337-350.

Joinson, A. (1999). Social desirability, anonymity, and internet-based questionnaires. Behavior Research Methods, Instruments, & Computers, 31(3), pp. 433 – 438. doi:10.3758/bf03200723

Kaur, H. (2018). An investigation of a relationship between aggression and wellbeing among adolescents. *Asian Review of Social Sciences, 7*(3), pp. 86-93. https://doi.org/10.51983/arss-2018.7.3.1462

Kent, S. L. (2001). *The ultimate history of video games: from Pong to Pokémon and beyond: The story behind the craze that touched our lives and changed the*

world. Prima.

Kestenbaum G.I., & Weinstein L. (1985). Personality, psychopathology, and developmental issues in male adolescent video game use. *Journal of the American Academy of Child Psychiatry*, *24*(3), pp. 329–333. doi:10.1016/s0002-7138(09)61094-3

Kilinc, A., & Granello, P. F. (2003). Overall life satisfaction and help-seeking attitudes of Turkish College students in the United States: Implications for college counselors. *Journal of Counseling Psychology*, *6*, pp. 56 – 68. https://doi.org/10.1002/j.2161-1882.2003.tb00227.x

Krahé, B., & Möller, I. (2004). Playing violent electronic games, hostile attributional style, and aggression-related norms in German adolescents. *Journal of Adolescence*, *27*(1), pp. 53–69. doi:10.1016/j.adolescence.2003.10.006

Kühn, S., Kugler, D. T., Schmalen, K., Weichenberger, M., Witt, C., & Gallinat, J. (2018). Does playing violent video games cause aggression? A longitudinal intervention study. *Molecular Psychiatry*, *24(*8), pp.1220–1234. doi.org/10.1038/s41380-018-0031-7

Lance, C. E., & Vandenberg, R. J. (2009). *Statistical and methodological myths and urban legends: Doctrine, verity and fable in the organizational and Social Sciences* (pp.309-310). Routledge.

Lin, S., & Lepper, M. R. (1987). Correlates of children's usage of videogames and computers. *Journal of Applied Social Psychology*, *17*(1), pp. 72–93. doi:10.1111/j.1559-1816.1987.tb00293.x

Liu, Y., Teng, Z., Lan, H., Zhang, X., & Yao, D. (2015). Short-term effects of prosocial video games on aggression: an event-related potential study. Frontiers in Behavioral Neuroscience, *9*. doi:10.3389/fnbeh.2015.00193

Madran, H. A. D. (2012). Buss-Perry saldırganlık Ölçeği'nin Türkçe formunun geçerlik ve güvenirlik çalışması. *Türk Psikoloji Dergisi, 24*(2), pp. 1-6.

McClure, R. F., & Mears, F. G. (1986). Videogame playing and psychopathology. *Psychological Reports, 59*(1), pp. 59–62. doi:10.2466/pr0.1986.59.1.59

Meng, T. Y., Mei Xin, M. W., Chen, G. Y., & Nainee, S. (2017). The effect of violent video game exposure on the aggression level of undergraduates. *Sains Humanika, 9*(3-2). doi.org/10.11113/sh.v9n3-2.1275

Miller, N. E. (1944). Experimental studies of conflict. In J. M. Hunt, *Personality and the behavior disorders*. pp. 431‑465. Ronald Press.

Miller, N. E. (1948). Theory and experiment relating psychoanalytic displacement to stimulus-response generalization. *The Journal of Abnormal and Social Psychology, 43*(2), 155‑178. doi:10.1037/h0056728

Möller, I., & Krahé, B. (2009). Exposure to violent video games and aggression in German adolescents: A longitudinal analysis. *Aggressive Behavior, 35*(1), pp. 75–89. doi:10.1002/ab.20290

Nabavi, RT. (2012). Bandura's Social Learning Theory & Social Cognitive Learning Theory. *Journal of Personality and Social Psychology, 1*(6), 589–612.

Pettit, J. W., Roberts, R. E., Lewinsohn, P. M., Seeley, J. R., & Yaroslavsky, I. (2011). Developmental relations between perceived social support and depressive symptoms through emerging adulthood: Blood is thicker than water. *Journal of Family Psychology, 25*(1), pp. 127–136. doi:10.1037/a0022320

Polman, H., de Castro, B. O., & van Aken, M. A. G. (2008). Experimental study of the differential effects of playing versus watching violent video games on children's aggressive behavior. *Aggressive Behavior, 34*(3), pp. 256–264. doi:10.1002/ab.20245

Prescott, A. T., Sargent, J. D., & Hull, J. G. (2018). Metaanalysis of the relationship between violent video game play and physical aggression over time. *Proceedings of the National Academy of Sciences*. doi:10.1073/pnas.1611617114

Przybylski, A. K., & Weinstein, N. (2019). Violent video game engagement is not associated with adolescents' aggressive behaviour: evidence from a registered report. *Royal Society Open Science, 6*(2). doi:10.1098/rsos.171474

Przybylski, A. K., Deci, E. L., Rigby, C. S., & Ryan, R. M. (2014). Competence-impeding electronic games and players' aggressive feelings, thoughts, and behaviors. *Journal of Personality and Social Psychology, 106*(3), 441–457. doi:10.1037/a0034820

Rajchert, J., & Winiewski, M. (2016). The behavioral approach and inhibition systems' role in shaping the displaced and direct aggressive reaction to ostracism and rejection. *Personality and Individual Differences, 88*, pp. 272–279. doi.org/10.1016/j.paid.2015.09.018

Ren, D., Wesselmann, E. D., & Williams, K. D. (2016). Evidence for another response to ostracism: Solitude seeking. *Social Psychological and Personality Science, 7*, pp. 204-212.

Roisman, G. I., Masten, A. S., Coatsworth, J. D., & Tellegen, A. (2004). Salient and emerging developmental tasks in the transition to adulthood. *Child Development, 75*(1), pp. 123–133. doi:10.1111/j.1467-8624.2004.00658.x

Rushbrook S. (1986). Messages of video games: Social implications. (Doctoral dissertation, University of California Los Angeles). *Dissertation Abstracts International. 47*(6).

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of

intrinsic motivation, social development, and well-being. *American Psychologist, 55*, pp. 68-78.

Ryan, R. M., Rigby, C. S., & Przybylski, A. (2006). The motivational pull of video games: A Self-Determination Theory approach. *Motivation and Emotion, 30*(4), 344 – 360. doi:10.1007/s11031-006-9051-8

Sherry, J. (2001). The effects of violent video games on aggression. A meta-analysis. *Human Communication Research, 27*(3), pp. 409–431. doi:10.1093/hcr/27.3.409

Silvern, S. B., & Williamson, P. A. (1987). The effects of video game play on young children's aggression, fantasy and prosocial behavior. *Journal of Applied Developmental Psychology, 8*, pp. 453-462.

Simmons, J., Nelson, L., & Simonsohn, U. (2021). Pre-registration: Why and how. *Journal of Consumer Psychology, 31*(1), pp.151–162. doi:10.1002/jcpy.1208

Sozen, A. I., Tanaka, T., & Nakano, S. (2020). Cross-Cultural Social Skills of Turkish Students in Japan: Implications for Overcoming Academic and Social Difficulties During Cross-Cultural Transition. *IAFOR Journal of Psychology & the Behavioral Sciences, 6*(1). https://doi.org/10.22492/ijpbs.6.1.02

Sunar, D. & Fişek Okman, G. (2004). Contemporary Turkish families. In U. Gielen, & J. Roopnarine (Eds.), *Families in global perspective.* Boston, MA: Allyn and Bacon.

Teague, S., Youssef, G. J., Macdonald, J. A., Sciberras, E., Shatte, A., … Hutchinson, D. (2018). Retention strategies in longitudinal cohort studies: a systematic review and meta-analysis. *BMC Medical Research Methodology, 18*(1). doi:10.1186/s12874-018-0586-7

Tedeschi, J.T., & Felson, R.B. (1994). Violence, aggression, & coercive actions.

American Psychological Association. https://doi.org/10.1037/10160-000

Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and Social Psychology, 81*(6), pp. 1058–1069.

Van't Veer, A. E., & Giner-Sorolla, R. (2016). Pre-registration in social psychology: A discussion and suggested template. *Journal of Experimental Social Psychology, 67,* pp.2–12. doi:10.1016/j.jesp.2016.03.004

White, H. R., Bray, B. C., Fleming, C. B., & Catalano, R. F. (2009). Transitions into and out of light and intermittent smoking during emerging adulthood. *Nicotine & Tobacco Research, 11*(2), pp. 211–219. doi:10.1093/ntr/ntn017

Williams, K. D. (2007). Ostracism. *Annual Review of Psychology, 58*(1), pp. 425–452. doi:10.1146/annurev.psych.58.1104

Williams, K. D. (2009). Ostracism: A temporal need-threat model. In M. P. Zanna (Ed.), *Advances in experimental social psychology,* Vol. 41, (pp. 275–314). Elsevier Academic Press. doi.org/10.1016/S0065-2601(08)00406-1

Williams, K. D., Cheung, C. K., and Choi, W. (2000). Cyberostracism: effects of being ignored over the internet. *Journal of Personality and Social Psychology*, *79*, pp. 748–762. doi: 10.1037/0022-3514.79.5.748

Willoughby, T., Adachi, P. J. C., & Good, M. (2012). A longitudinal study of the association between violent video game play and aggression among adolescents. *Developmental Psychology, 48*(4), pp. 1044–1057. doi:10.1037/a0026046

Zillmann, D. (1983). Transfer of excitation in emotional behavior. In J. T. Cacioppo & R. E. Petty (eds.), *Social psychophysiology: A sourcebook.* (pp. 215–240). New York: Guilford.

APPENDIX I

Informed Consent Form

Sayın Gönüllü,

Bu çalışma Yaşar Üniversitesi Psikoloji Bölümü Dr. Öğretim Üyesi Sinan Alper danışmanlığında, Genel Psikoloji Yüksek Lisans öğrencisi Benan Ayazoğlu Tarafından tez çalışması olarak yürütülmektedir. Çalışmanın amacı, 18-25 yaş arası üniversite öğrencilerinin video oyunları oynama davranışlarını incelemektir. Katılımcılar gönüllü olmalıdır. Katılımcılarımız en az 1 yıldır şiddet içerikli video oyunları oynuyor olmalıdırlar. Çalışmada mail adresleriniz dışında hiçbir kişisel kimlik bilgisi gerekmemektedir. Mail adreslerinizi size tekrar ulaşabilmek ve çalışma sonunda yapılacak çekilişe katılımınızı sağlayabilmek için anketin en sonunda istiyor olacağız. Çekilişe yalnızca çalışmayı sonuna kadar tamamlayanlar ve geçerli bir e-mail adresi sağlayanlar katılabilecektir. Mail adresiniz ve cevaplarınız kesinlikle gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilecektir. Elde edilen bilgiler yalnızca bilimsel amaçlar dahilinde kullanılacaktır. Çalışmada katılımcıları rahatsız edebilecek sorular bulunmamaktadır, ancak katılım esnasında herhangi bir sebeple rahatsız hissederseniz, çalışmayı istediğiniz zaman bırakabilirsiniz.

Çalışmamız boylamsal bir çalışmadır (aynı katılımcılarla belirli zaman aralıklarıyla yapılan bir çalışma) ve bu nedenle aynı bilgileri sizden 6 hafta aralıklarla toplam 3 kez toplayacağız. Bu çalışmaya katılmanız halinde, 6 haftalık aralıklarla size mail ile aynı anketi tekrar iletiyor ve cevaplarınızı bekliyor olacağız. Çalışmamızın özelliği gereği, çalışmamız yalnızca sizin 3 kere katılımınızla anlamlı olacağından düzenli katılımınızı önemle rica ediyoruz. Katılımınız ne kadar düzenli olursa, çekilişi kazanma şansınız o kadar artacaktır. Çekilişin detayları şöyledir: Çalışma bittikten sonra (3 ölçümün hepsi tamamlandığında) rastgele 3 katılımcıya kişi başı 150'şer TL değerinde Steam veya Amazon hediye kartı verilecektir. Yapılacak olan 3 ölçümden sadece ilkine katılanlar 1 çekiliş hakkına sahip olacaktır, 3 ölçümden ilk ikisine katılanlar 2 çekiliş hakkına sahip olacaktır, 3 ölçümün hepsine katılanlar 10 çekiliş hakkına sahip olacaktır. Özetle, tüm ölçümlere katılırsanız kazanma şansınız 10 kat artacaktır. Bu yüzden size mail yolu ile yapılacak hatırlatmaları takip edip, tüm ölçümlere katılmanızı önemle rica ediyoruz.

Çalışmamız yaklaşık 5-10 dakika sürmektedir. Sorulara vereceğiniz samimi ve dürüst

cevaplar araştırmanın bilimsel niteliği açısından son derece önemlidir. Bilimsel katkı ve yardımlarınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak isterseniz Yaşar Üniversitesi Genel Psikoloji Yüksek Lisans Bölümü Öğrencisi Benan Ayazoğlu ile iletişime geçebilirsiniz. Gönüllü katılımınızı belirtmek için, lütfen aşağıda bulunan kutucuğu işaretleyiniz.

☐ Bu çalışmaya tamamen kendi isteğim ile katılıyorum ve istediğimde katılımdan çıkabileceğimin farkındayım, bilgileri okuyup anladığımı onaylıyorum ve bu araştırmaya katılmayı kabul ediyorum.

APPENDIX II

Demographic Information Form

Lütfen size uygun kutucuğu işaretleyerek ve boşlukları doldurarak tüm soruları doldurunuz.

Cinsiyetiniz:

Kadın	Erkek

Doğduğunuz Ay/Yıl: _____/_____

Eğitim Durumunuz:

- ☐ Ortaokul öğrencisi/mezunu
- ☐ Lise öğrencisi/mezunu
- ☐ Lisans öğrencisi/mezunu
- ☐ Lisansüstü öğrencisi/mezunu

E-mail adresiniz: _____

APPENDIX III

Gaming Information Form for Video Game Hours

Son 6 haftadır, haftalık ortalama kaç saat şiddet içerikli video oyunları oynadınız? : _____

Not: Şiddet içerikli video oyunları, zarar verici aletlerin (bıçak, silah vs.) kullanıldığı, oyundaki diğer karakterlere fiziksel şiddet içeren oyunlardır (örneğin: Call of Duty, Grand Theft Auto, League of Legends, Counter-Strike, Among Us).

Son 6 haftadır haftalik ortalama kaç saat şiddet içerikli olmayan şiddet içerikli video oyunları oynadınız? : ____

Not: Şiddet içerikli olmayan video oyunları, zarar verici aletlerin (bıçak, silah vs.) kullanılmadığı, oyundaki diğer karakterlere fiziksel şiddet içermeyen oyunlardır (örneğin: Tetris, The Room, Portal, FIFA).

APPENDIX IV

Gaming Information Form for Feeling of Competence in Games

Son 6 haftadır oynadığınız şiddet içerikli video oyunlarında kendinizi ne kadar başarılı hissettiniz?

1 (Oldukça Az)	2	3	4	5 (Oldukça Çok)

Son 6 haftadır oynadığınız şiddet içerikli <u>olmayan</u> video oyunlarında kendinizi ne kadar başarılı hissettiniz?

1 (Oldukça Az)	2	3	4	5 (Oldukça Çok)

APPENDIX V

Ostracism Experience Scale (Akın et al., 2016)

Lütfen aşağıdaki ifadeleri okuduktan sonra kendinizi değerlendirip sizin için en uygun olan seçeneği işaretleyiniz.					
Genellikle diğer insanlar **son 6 hafta içinde**;	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
1-Bana görünmez biriymişim gibi davrandılar.	1	2	3	4	5
2- Benim varlığımı yok saydılar.	1	2	3	4	5
3- Yürürken selam verdiğimde karşılık vermediler.	1	2	3	4	5
4- Onlarla konuşurken beni görmezden geldiler.	1	2	3	4	5
5- Beni önemsemediler.	1	2	3	4	5
6- Benim onlarla ilgilenmem için çaba harcadılar.	1	2	3	4	5

APPENDIX VI

Buss-Perry Aggression Scale (Buss & Perry, 1992; Madran, 2012)

Lütfen aşağıdaki ifadeleri okuduktan sonra kendinizi değerlendirip sizin için en uygun olan seçeneği işaretleyiniz.					
Son 6 hafta içinde;	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
1- Bazı arkadaşlarım benim öfkeli biri olduğumu söylediler.	1	2	3	4	5
2- Gerektiğinde hakkımı korumak için şiddete başvurdum	1	2	3	4	5
3- Birisi bana fazlasıyla iyi davrandığında "acaba benden ne istiyor" diye düşündüm	1	2	3	4	5
4- Arkadaşlarımın görüşlerine katılmadığım zaman bunu onlara açıkça söyledim	1	2	3	4	5
5- Öfkeden deliye döndüğümde bir şeyler kırıp döktüm	1	2	3	4	5
6- İnsanlar benim görüşlerime katılmadıklarında onlarla tartışmaktan kendimi alıkoymadım	1	2	3	4	5
7- Bazı olaylara/kişilere yönelik kızgınlığım uzun süre bitmek bilmedi	1	2	3	4	5
8- Bazen başkalarına vurma dürtümü kontrol edemedim	1	2	3	4	5
9- Sakin biriydim	1	2	3	4	5
10-Tanımadığım insanlar bana fazla yakın davrandıklarında onlara şüpheyle yaklaştım	1	2	3	4	5
11- Tanıdığım insanları tehdit ettiğim oldu	1	2	3	4	5
12- Çok çabuk parladım ve hemen sakinleştim	1	2	3	4	5
13- Birisi bana sataştığında kolaylıkla onu itip tartaklayabilirdim	1	2	3	4	5
14- İnsanlar sinirimi bozsalardı kolaylıkla onlar hakkında ne düşündüğümü söyleyebilirdim	1	2	3	4	5
15- Zaman zaman kıskançlık beni yiyip bitirdi	1	2	3	4	5

16- Son 6 haftaki düşüncelerime göre, bir insana vurmanın mantıklı bir gerekçesi olamaz	1	2	3	4	5
17- Bazen hayatın bana adaletsiz davrandığını düşündüm	1	2	3	4	5
18- Öfkemi kontrol etmekte zorluk çektim	1	2	3	4	5
19- Yapmak istediğim bir şey engellendiğinde kızgınlığımı açıkça ortaya koydum	1	2	3	4	5
20- Zaman zaman insanların arkamdan güldüğü duygusuna kapıldım	1	2	3	4	5
21- İnsanlarla sıkça görüş ayrılığına düştüm.	1	2	3	4	5
22- Birisi bana vursa ben de karşılık veririrdim	1	2	3	4	5
23- Bazen kendimi patlamaya hazır bir bomba gibi hissettim	1	2	3	4	5
24- Diğer insanların her zaman çok iyi fırsatlar yakaladıklarını düşündüm	1	2	3	4	5
25- Birisi beni itseydi onunla kavgaya tutuşurdum	1	2	3	4	5
26- Arkadaşlarımın arkamdan konuştuklarını biliyorum	1	2	3	4	5
27- Arkadaşlarım münakaşacı/tartışmayı seven biri olduğumu söylediler	1	2	3	4	5
28- Bazen olmadık şeylere ortada mantıklı bir neden yokken aniden sinirlendim, tepki verdim	1	2	3	4	5
29- Çoğu insana kıyasla daha sık kavgaya karıştım	1	2	3	4	5

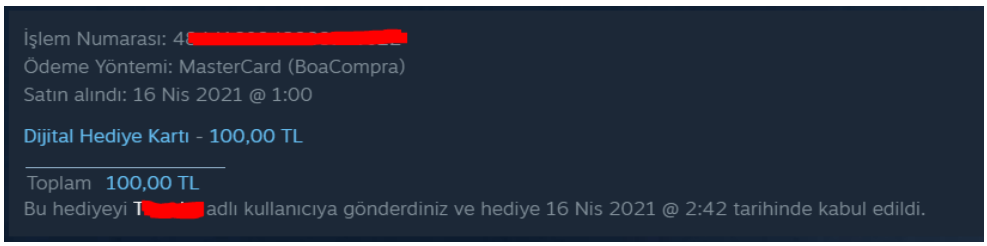
APPENDIX VII

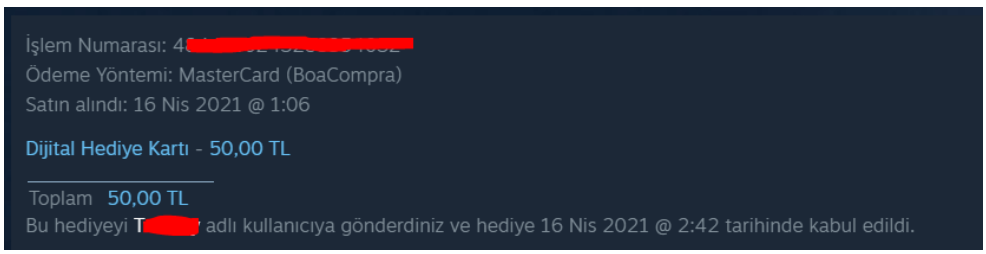
Proof of the Promised Amazon/ Steam Gifts

Winner Number 1:

Winner Number 2:

Winner Number 3:





APPENDIX VIII

Descriptive Statistics of Demographic Information for the Data with Dropouts Omitted

Table A.1. Descriptive Statistics of Demographic Information for the Data with Dropouts

Sample Characteristics	*n*	%	*M*	*SD*	Min	Max
Age			21.54	1.77	18	25
Gender						
Male	97	77.93				
Female	29	22.07				
Education						
High school student/graduate	5	3.45				
Bachelor student/graduate	126	86.9				
Postgraduate student/graduate	14	9.65				

Note. $N = 145$

The sample characteristics of the data with dropouts omitted showed that the age ranged between 18 and 25, and the mean age of the sample was 21.54 (SD = 1.77). For gender, the number of the male participants (n = 97, %77.93) were significantly higher than the female participants (n = 29, %22.07). In addition, the participants were mostly bachelor student/graduates (n = 126, %86.9); and the number of postgraduate student/graduates (n = 14, %9.65) and high school student/graduates (n = 5, %3.45) were significantly lower.

Analyses for the Data with Dropouts Omitted

Table A.2. Results of the Linear Mixed Model Analysis for the Data with Dropouts Omitted

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
Intercept	73.509	1.272	71.015	76.003	144	57.769	< .001
VVG Hours	0.010	0.013	-0.016	0.036	324	0.769	0.442
Non-VVG Hours	-0.003	0.048	-0.097	0.092	360	-0.061	0.952
Ostracism	0.651	0.191	0.276	1.026	371	3.402	< .001
Competence in VVG	-0.284	0.666	-1.590	1.022	336	-0.426	0.670
VVG Hours*Ostracism	0.008	0.005	-0.001	0.016	325	1.679	0.094
VVG Hours*Competence in VVG	0.027	0.019	-0.010	0.064	309	1.422	0.156

Note. VVG = Violent Video Games.

The linear mixed model analysis for the data with dropouts omitted indicated that there is no relationship between the increase in hours spent violent video game playing through time and the increase in aggression through time, b = 0.01, SE = 0.013, 95% CI [-0.016, 0.036], $t(324) = 0.769$, p = 0.442. Similarly, there is not a relationship between the increase in hours spent non-violent video game playing through time and the increase in aggression through time, b = -0.003, SE = 0.048, 95% CI [-0.097, 0.092], $t(360) = -0.061$, p = 0.952. So, neither violent gaming nor non-violent gaming hours were found to have a significant relationship with aggression through measurements.

When the feeling of competence during violent video game playing was examined as a moderator, it was found that increase in feeling of competence in games through time did not moderate the relationship between the increase in hours spent violent video game playing through time and the increase in aggression through time, b = 0.027, SE = 0.019, 95% CI [-0.01, 0.064], $t(309) = 1.422$, p = 0.156.

When it comes to ostracism through time, the results revealed that increase in ostracism of the participants through time did not moderate the relationship between the increase in hours spent violent video game playing through time and the increase in aggression through time, $b = 0.008$, $SE = 0.005$, 95% CI [-0.001, 0.016], $t(325) = 1.679$, $p = 0.094$. However, the analysis showed that there is a positive relationship between the increase in ostracism of the participants through time and the increase in aggression through time, $b = 0.65$, $SE = 0.20$, 95% CI [0.28, 1.03], $t(371) = 3.40$, $p < .001$.

Therefore, in our case, increase in ostracism is the only predictor of the increase in aggression. Increase in hours of violent and non-violent video game playing and increase in feeling of competence in games did not predict aggression. Additionally, increase in feeling of competence in games and increase in ostracism did not moderate the relationship between increase in hours of violent video game playing and increase in aggression.

So, all the results which were calculated according to the data of all the participants (even if they dropped out in between the measurements) are the same as the previous results, which were calculated according to the participants who attended all three measurements (without dropping out or missing any measurements). In detail, as was mentioned before, increase in ostracism was the only significant predictor of the increase in aggression. Increase in hours of violent and non-violent video game playing and increase in feeling of competence in games did not predict aggression. And, increase in feeling of competence in games and increase in ostracism did not moderate the relationship between increase in hours of violent video game playing and increase in aggression.

APPENDIX IX

Results for the Exploratory Analysis of Genders Separately

Even though we did not state an expectation or hypotheses about the potential different results between male and female participants, we still analyzed them separately as an exploratory analysis. To do this, we conducted two separate analyses for both male data and female data separately.

Table A.3. Results of the Linear Mixed Model Analysis for only Female Data (without Dropouts and with Dropouts Combined)

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
Intercept	78.481	1.966	74.627	82.335	61.3	39.915	< .001
VVG Hours	-0.018	0.044	-0.103	0.067	120.4	-0.423	0.673
Non-VVG Hours	0.109	0.119	-0.124	0.341	116.5	0.915	0.362
Ostracism	1.260	0.346	0.582	1.939	114.2	3.640	< .001
Competence in VVG	1.712	1.630	-1.483	4.906	119.4	1.050	0.296
VVG Hours*Ostracism	-0.008	0.013	-0.034	0.018	111.0	-0.625	0.533
VVG Hours*Competence in VVG	0.011	0.071	-0.128	0.150	108.7	0.158	0.875

Note: VVG = Violent Video Games.

As can be seen in the Table A.3., according to the linear mixed model analysis only for the female participants' data, all the results came out the same with the analysis of the original data with males and females combined.

Table A.4. Results of the Linear Mixed Model Analysis for only Male Data (without Dropouts and with Dropouts Combined)

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
Intercept	72.737	1.119	70.543	74.932	198	64.988	< .001
VVG Hours	0.011	0.016	-0.021	0.042	331	0.679	0.497
Non-VVG Hours	-0.038	0.026	-0.089	0.012	316	-1.470	0.143
Ostracism	0.690	0.192	0.314	1.066	403	3.599	< .001
Competence in VVG	-0.203	0.699	-1.575	1.169	311	-0.290	0.772
VVG Hours*Ostracism	0.007	0.004	-0.001	0.016	321	1.663	0.097
VVG Hours*Competence in VVG	0.021	0.019	-0.016	0.059	269	1.120	0.264

Note: VVG = Violent Video Games.

As can be seen in the Table A.4., according to the linear mixed model analysis only for the male participants' data, all the results came out the same with the analysis of the original data with males and females combined.

APPENDIX X

Analysis of the "Anger" and "Frustration" Factors of the Overall Buss-Perry Aggression Scale (Buss & Perry, 1992)

Table A.5. Results of the Linear Mixed Model Analysis for the "Anger" Factor Data (without Dropouts and with Dropouts Combined)

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
Intercept	18.059	0.350	17.372	18.746	262	18.746	< .001
VVG Hours	0.004	0.005	-0.005	0.014	413	0.887	0.375
Non-VVG Hours	9.27e–4	0.009	-0.019	0.018	426	-0.097	0.922
Ostracism	0.265	0.064	0.140	0.390	551	4.159	< .001
Competence in VVG	-0.208	0.246	-0.690	0.275	483	-0.844	0.399
VVG Hours*Ostracism	0.001	0.001	-0.002	0.004	459	0.768	0.442
VVG Hours*Competence in VVG	0.002	0.007	-0.012	0.016	384	0.236	0.814

Note: VVG = Violent Video Games.

As can be seen in the Table A.5., according to the linear mixed model analysis for the "Anger" factor's data, the results came out as the same as the overall scale.

Table A.6. Results of the Linear Mixed Model Analysis for the "Frustration" Factor Data (without Dropouts and with Dropouts Combined)

Names	*b*	*SE*	95% Confidence Interval		*df*	*t*	*p*
			Lower	Upper			
Intercept	29.218	0.399	28.436	30.001	249	73.16	< .001
VVG Hours	0.015	0.009	-0.002	0.032	519	1.768	0.078
Non-VVG Hours	-0.017	0.011	-0.040	0.006	226	-1.451	0.148
Ostracism	1.044	0.090	0.867	1.222	362	11.512	< .001
Competence in VVG	0.357	0.392	-0.410	1.125	432	0.913	0.362
VVG Hours*Ostracism	0.002	0.003	-0.004	0.001	527	0.578	0.564
VVG Hours*Competence in VVG	-8.64e−4	0.013	-0.026	0.024	396	-0.0679	0.946

Note: VVG = Violent Video Games.

As can be seen in the Table A.6., according to the linear mixed model analysis for the "Frustration" factor's data, the results came out as the same as the overall scale.