

Adolescent Gaming and the Adolescent-Parent Relationship over  
time  
The Mediating Role of Quality of Communication about Gaming and  
Arguments between Adolescents and Parents

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## ABSTRACT

Since gaming has become increasingly popular, insight in its effects is essential. This paper aims to examine the relationship between adolescent gaming behavior and the adolescent-parent relationship and its underlying mechanisms, in this case the quality of communication about gaming and the arguments between adolescents and their parents. To answer the research questions, a part of the Digital Youth Project of the University of Utrecht was used. A two-wave longitudinal sample of 11- to 15-year-olds ( $N = 299$ ) filled in annual online measurements in class. Gaming behavior was measured through items about gaming frequency. The relationship between adolescents and parents were measured through the Family Environment Scale. The quality of gaming-related communication was measured through three items about the Quality of Communication about gaming. Arguments between adolescents and parents was measured through one item from the Family Environment Scale. Regression analysis showed that gaming behavior was linked to a weaker relationship between adolescents and parents. Regression analyses also showed that adolescent gaming behavior did not significantly predict the quality of communication about gaming and arguments between adolescents and parents. Quality of communication about gaming and arguments between adolescents and parents were also not significant predictors for the adolescent-parent relationship. Therefore, the quality of communication about gaming as well as arguments between adolescents and parents were no mediators in the relationship between adolescent gaming behavior and the adolescent-parent relationship. Despite the fact that adolescent gaming behavior and the adolescent-parent relationship are related, it is not yet clear what this relationship looks like in terms of other factors that come into play.

Aangezien gamen in populariteit is gestegen, is inzicht in de effecten essentieel. Het doel van dit paper is het onderzoeken van de relatie tussen het gamegedrag van adolescenten en de adolescent-ouderrelatie met de mogelijke onderliggende mechanismen, in dit geval de kwaliteit van communicatie over gamen en de ruzies tussen adolescenten en hun ouders. Om de onderzoeksvragen te beantwoorden is een deel van het Digital Youth Project van de Universiteit van Utrecht gebruikt. Een twee golf longitudinale steekproef van 11- tot 15-jarigen ( $N = 299$ ) heeft een jaarlijkse online vragenlijst ingevuld in de klas. Adolescent gamegedrag is gemeten door middel van vragen over de game frequentie. De relatie tussen adolescenten en ouders is gemeten middels de Family Environment Scale. De kwaliteit van gaming-gerelateerde communicatie is gemeten middels drie items over de kwaliteit van communicatie over gamen. Ruzies tussen adolescenten en ouders is gemeten middels een item

uit de Family Environment Scale. Regressieanalyse wees uit dat gamegedrag gelinkt was aan een zwakkere adolescent-ouderrelatie. Het gamegedrag van adolescenten was geen significante predictor voor de kwaliteit van communicatie over gamen en ruzies tussen adolescenten en ouders. Ook waren de kwaliteit van communicatie over gamen en ruzies tussen adolescenten en ouders geen significante voorspellers van de adolescent-ouderrelatie. Daarom zijn de kwaliteit van communicatie over gamen en ruzies tussen adolescenten en ouders geen mediators in de relatie tussen het gamegedrag van adolescenten en de adolescent-ouderrelatie. Ondanks het feit dat er een relatie bestaat tussen het gamegedrag van adolescenten en de adolescent-ouderrelatie is het nog niet duidelijk hoe deze relatie er precies uitziet qua andere factoren die mogelijk een rol spelen.

### **Adolescent Gaming and the Adolescent-Parent Relationship over time The Mediating Role of Quality of Communication about Gaming and Arguments between Adolescents and Parents**

Gaming has become a popular leisure time activity for many people, especially adolescents (Brooks et al., 2016). A video game is defined as an interactive application, entering into interaction with a player (Djaouti et al., 2008). In the Netherlands, 95% of teenage boys and 81% of teenage girls report to play games regularly (Simons et al., 2014) and it has become one of the most culturally, socially and economically significant forms of media (Newman, 2013). For some players, high game exposure indicates enthusiasm, whilst for others, it can become psychopathological (Spekman et al., 2013). Among 13 to 40-year-olds in the Netherlands, over five percent meets the DSM-V criteria for excessive gaming (Lemmens et al., 2015). Excessive gaming behavior is disproportionate but not always problematic gaming behavior (Lemmens et al., 2011). In some cases, excessive gaming behavior might have consequences for the adolescents' mental health (Wartberg et al., 2017).

Besides the negative effects of gaming on adolescents' mental health, excessive gaming behavior in adolescence can also negatively affect the adolescent's social life (Kowert et al., 2014), including the adolescent's relationship with their parents (Chai et al., 2011). This is concerning because a weaker parent-child attachment can harm adolescent development (Bowlby et al., 2013). However, there is limited evidence about the underlying mechanisms of the relationship between adolescent gaming and the adolescent-parent relationship. Two possible underlying mechanisms could be the quality of communication about gaming between the adolescent and their parents (King et al., 2017; White, 2000) and arguments between adolescents and their parents (Shek, 2019; Barber et al., 1994).

Since gaming has become increasingly popular, insight in the possible negative effects of gaming, particularly excessive gaming, is needed. The aim of this paper is to examine the relationship between adolescent gaming behavior and the adolescent-parent relationship and its underlying mechanisms (i.e. mediators). This study aims to raise awareness about the possible negative effects of excessive gaming behavior and to form a base for future research on the topic of gaming behavior in adolescents.

### **Studies in the Relationship between Adolescent Gaming and the Adolescent-Parent Relationship**

Some research has already been done on the relationship between adolescent gaming and online behavior and the dynamics between adolescents and parents. Overall, this body of mainly cross-sectional studies showed that more excessive or problematic adolescent gaming behavior was often associated with a weaker adolescent-parent relationship.

For example, a cross-sectional study by DaCharlie et al. (2011) suggested that pathological gamers rated their family environment lower than non-pathological gamers. In addition, a cross-sectional study of two cohorts aged 14-15 done sixteen years apart by Richards et al. (2010) showed that more screen time was related to a lower adolescent-parent attachment in both cohorts. Some research also has been done specifically on the relationship between adolescent gaming behavior and different aspects of the parent-child relationship (King et al., 2017). The results of this meta-analysis of mainly cross-sectional studies showed that adolescents with Internet gaming problems reported overall significantly less trust and communication and greater anger in their parental relationships.

### **The Mediating Role of the Quality of Communication about gaming**

One of the possible mediators in the relationship between adolescent gaming behavior and the adolescent-parent relationship is the quality of communication about gaming between adolescents and their parents. Overall, research shows that adolescent gaming behavior decreases the quality of communication about gaming between adolescents and parents. Research has shown that adolescents that show excessive gaming behavior experience less trust and communication in parental relationships compared to adolescents without Internet Gaming Disorder (King et al., 2017). A lack of positive family communication may result in a weaker adolescent-parent relationship, as proven by White (2000).

Former research has shown that adolescent gaming behavior is related to a weaker parent-child communication. According to research by Bonnaire et al. (2019), more severe

gaming behavior can blur the boundaries between realities for the adolescent. Game reality can become priority over everyday reality of family and social life. Next to that, this research also suggests that it has been proven that the more the adolescent plays videogames, the more likely parents are to judge video games in a negative way. Loss of reality and criticism about gaming can cause a lack of communication about this topic. Communication between adolescents and parents about video games that does exist is often characterized as defensive or aggressive.

Former research overall shows that a better quality of communication is related to a stronger adolescent-parent relationship. For example, Kafka et al. (1991) suggest that a positive adolescent-parent relationship was characterized by more frequent communication between them. Other than that is open communication a way for parents to show their child that they respects their opinions and feelings. Olson et al. (1983) suggested that frequent and open positive family communication makes it more likely that adolescents and parents will have a good relationship.

### **The Mediating Role of Arguments with Parents**

A related possible mediator in the relationship between adolescent gaming behavior and the adolescent-parent relationship is arguments between adolescents and their parents. Overall, it is highly likely that parents have a negative attitude towards excessive video gaming. This results in many parents trying to control their adolescent child's gaming behavior (Eklund et al., 2013). This often provokes conflict between adolescents and parents (Bonnaire et al., 2017). Arguments between adolescents and parents about gaming could be about the amount of playing, the lack of time spent on other more important tasks or education, the type of games or the time of day the gamer plays games (Schneider et al., 2017). These arguments can have a diminishing effect on the parent-child relationship.

Former research indicates that excessive gaming behavior in adolescents relates to arguments between adolescents and their parents. One study shows that during adolescence, the amount of conflicts between adolescents and their parents about any topic increases while warmth decreases, which might contribute to more arguments between the two (McGue et al., 2015). Also, adolescents exposed to greater amounts of video games reported getting into arguments with teachers more often (Gentile et al., 2004). Furthermore, attempts to reduce gaming in children and adolescents often leads to arguments within the family (Shek, 2019).

Former research overall shows that arguments between adolescents and their parents have a negative effect on the parent-child relationship. For example, a cross-cultural

comparison research by Barber et al. (1994) shows that conflicts between adolescents and parents are related to behavioral and family problems. Also, a literature review suggested that high levels of parent-adolescent conflict and frequent aversive interaction are associated with family dysfunction. Furthermore, conflicts and arguments are the primary complaints of parents about the relationship with their adolescents (Montemayor, 1986).

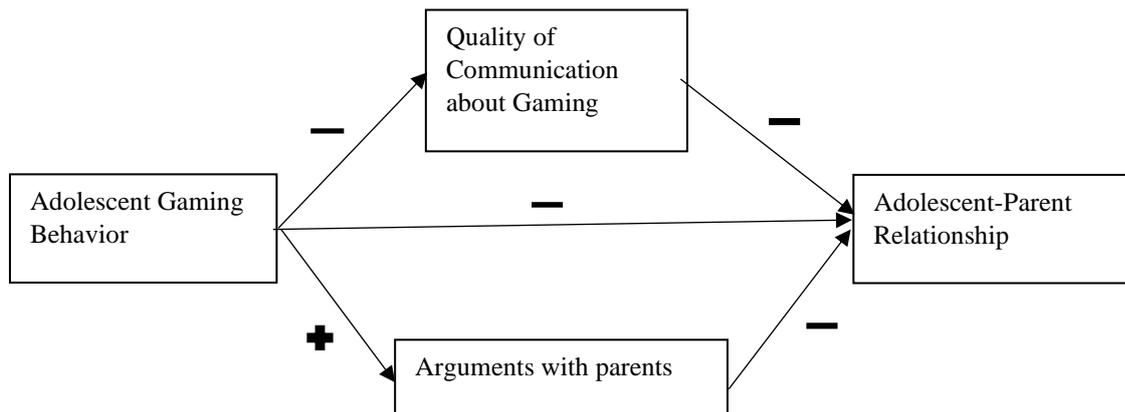
### **The Current Study**

The main research question of this study is: *To what extent is adolescent gaming behavior a predictor for the adolescent-parent relationship over time?* It was hypothesized that more adolescent gaming behavior is a significant predictor for a weaker adolescent-parent relationship (H1). The second research question is: *To what extent does the quality of communication about gaming mediate the association between adolescent gaming behavior and the adolescent-parent relationship?* The second hypothesis is that adolescent gaming behavior is negatively correlated with the quality of communication about gaming (H2a) and that the quality of communication about gaming is positively correlated with the relationship between adolescents and their parents (H2b). The third research question is: *To what extent do arguments with parents mediate the relationship between adolescent gaming behavior and the adolescent-parent relationship?* The third hypothesis is that adolescent gaming behavior is positively correlated with arguments between adolescents and parents (H3a) and that arguments between adolescents and their parents are negatively correlated with the adolescent-parent relationship (H3b). The hypotheses are all displayed in Figure 1.

### **Figure 1**

*Research model of the relationship between adolescent gaming behavior and the adolescent-parent relationship with the possible mediating factors of the quality of communication about gaming and arguments between adolescents and their parents*

## MODEL



## Method

### Sample and participants

The data used for the current study were derived from the Digital Youth Project. Participants were followed for one year with two assessments from February to March 2015 (T1) and 2016 (T2). From all sample, 372 participants filled in the questionnaire at both assessments. The participants who did not provide information on their gaming frequency, the relationship with their parents or both were excluded from the sample, since information on these variables was essential to find answers to the research questions of this study. After excluding these participants, the final sample consisted of 299 participants. The adolescents were somewhere between the ages of 11 and 15 ( $M_{age} = 12.86$ ,  $SD = 0.78$ ) during T1. The sample consisted of 56.2% boys and 43.8% girls. The major part of the participants had a Dutch ethnical background (95.7%). All educational levels in Dutch secondary education were included. The majority of 43.8% was in moderate or higher level education, 32.8% was in lower to medium level education and 23.4% was in lower level education.

### Design, procedure and ethics

The Digital Youth Project is a multiple-wave longitudinal self-report survey study with a one-year time interval conducted at Utrecht University. The study consists of online questionnaires that were filled in by 7<sup>th</sup> and 8<sup>th</sup> grade students of secondary schools in the Netherlands. In the Netherlands, this means that the participants were in the 1<sup>st</sup> and 2<sup>nd</sup> grade during the first wave. Participants were recruited through secondary schools throughout the Netherlands. After ethical approval was obtained from the Faculty of Social Sciences of the University of Utrecht, participants and their parents were provided with informed consent and were given the right to refuse participation at any time. Participants were informed about the

fact that their personal information and question answers were handled confidentially and that individual results would not be shared. The questionnaires were filled in in the classroom. The questionnaires were taken using Qualtrics software.

## **Measurements**

### ***Adolescent gaming behavior***

Adolescent gaming behavior was measured through two items. Participants were asked how often they played videogames. Here, the answering options were 1 = *Less than one day a week*, 2 = *1 day per week*, 3 = *2 days per week*, 4 = *3 days per week*, 5 = *4 days per week*, 6 = *5 days per week*, 7 = *6 days per week* and 8 = *7 days per week*. Participating adolescents were also asked for how long they usually played games when they did so. Answering options here were 1 = *never*, 2 = *1 hour or less*, 3 = *2 hours*, 4 = *3 hours*, 5 = *4 hours*, 6 = *5 hours*, 7 = *6 hours*, 8 = *7 hours*, 9 = *8 hours* and 10 = *9 hours or more*. The scores of both items were recoded into the amount of days and the amount of hours the given answers indicated. The total adolescent gaming behavior per participant was calculated by multiplying the amount of days per week by the amount of hours per day. A higher total score indicated more severe gaming behavior.

### ***Adolescent-Parent Relationship***

The adolescent-parent relationship was measured through a subscale of the Family Environment Scale (Moos et al., 1994). This is a validated measure for examining the dynamics between adolescents and parents (Cronbach's  $\alpha = .82$ ). The subscale used for this paper consisted of five items, which were: 'How often do you criticize each other within your household?', 'How often do you hit each other within your household?', 'How often do arguments occur within your household?', 'How often does swearing occur within your household?' and 'How often does it happen that someone within your household gets so angry he or she starts throwing things?'. The answering options were 1 = *Never*, 2 = *Rarely*, 3 = *Sometimes*, 4 = *Often* and 5 = *Very often*. These five items were averaged into one mean score. A higher score indicated a weaker relationship between adolescents and parents.

### ***Quality of Communication about Gaming***

The variable of Quality of Communication about Gaming was measured through three items about the quality of communication about gaming. Participants were asked to what extent they feel 1) comfortable, 2) understood and 3) taken seriously when talking about

gaming with their parents. The answering options for all three items were 1 = *Not at all*, 2 = *Not*, 3 = *Sometimes*, 4 = *Quite*, 5 = *Totally*. These three items were averaged into one mean score. A higher score indicated a higher quality of communication about gaming between adolescents and parents.

### ***Arguments with parents***

The variable of Arguments between Adolescents and Parents was measured through a question from the subscale of the Family Environment Scale (Moos et al., 1994). In this question, the participant is asked how often arguments occur within the participant's household. The answering options were 1 = *Never*, 2 = *Rarely*, 3 = *Sometimes*, 4 = *Often* and 5 = *Very often*. A higher score indicated more arguments between adolescents and their parents.

## **Results**

### ***Descriptive statistics***

Descriptive statistics were calculated across measurement conditions for the total group of participants (Table 1). The average amount of hours adolescents spent playing games was 9.76.

Table 1 Descriptive Statistics Independent and Dependent Variables

	Mean	SD
Adolescent Gaming T1	9.76	10.82
Adolescent-Parent Relationship T1	2.02	0.64
Adolescent-Parent Relationship T2	2.11	0.74
Quality of Communication about Gaming T1	3.37	1.07
Arguments T1	2.46	0.91

### ***Adolescent gaming behavior and the adolescent-parent relationship***

Correlations between all variables that were measured and used at different time points can be found in table 2. The correlations show that more severe adolescent gaming behavior at T1 also means a significantly weaker adolescent-parent relationship at T2 ( $r = -.13$ ). This significant correlation was also found between adolescent gaming behavior at T1 and the adolescent-parent relationship at T1 ( $r = -.16$ ). Adolescent gaming behavior was also significantly correlated with arguments at T1 ( $r = .11$ ), but not with quality of communication

at T1. The adolescent-parent relationship at T2 was significantly correlated with the quality of communication at T1 ( $r = .14$ ) as well as with arguments at T1 ( $r = -.39$ ).

**Table 2 Correlations of Dependent and Independent Variables**

Variable	1	2	3	4	5
1. Adolescent Gaming Behavior T1	-				
2. Adolescent-Parent Relationship T1	-.16**	-			
3. Adolescent-Parent Relationship T2	-.13*	.49**	-		
4. Quality of Communication about GamingT1	-.08	.19**	.14**	-	
5. Arguments T1	.11*	-.81**	-.39*	-	-

\* $p < .05$  \*\* $p < .01$

***Relationship between adolescent gaming behavior and the adolescent-parent relationship***

The correlation matrix (table 2) showed that a significant correlation between adolescent gaming behavior at T1 and the adolescent-parent relationship at T1 and T2 was found. This would mean that more severe adolescent gaming behavior is associated with a weaker adolescent-parent relationship. Since this is the case for both measurement waves, this correlation seems to exist over time.

In order to find out whether adolescent gaming behavior actually leads to a change in the adolescent-parent relationship, a linear regression was executed. The results of this linear regression can be found in table 3. When the adolescent-parent relationship at T1 was not included as a control variable, adolescent gaming behavior at T1 seemed to be a significant predictor for the adolescent-parent relationship at T2 (Beta = .128,  $p = .027$ ). However, when the adolescent-parent relationship at T1 was taken into account, this effect disappeared and adolescent gaming at T1 was not a significant predictor for the adolescent-parent relationship at T2 (Beta = .050,  $p = .327$ ).

When this information is assembled in order to answer the main research questions of this paper, it can be concluded that a relationship between adolescent gaming behavior and the adolescent-parent relationship exists. However, adolescent gaming behavior was not a

significant predictor for the adolescent-parent relationship over time. This means that our hypothesis was rejected.

### ***Mediation Analysis – Quality of Communication about Gaming***

In order to find out whether the quality of communication about gaming was a mediator in the relationship between adolescent gaming behavior and the adolescent-parent relationship, a three-step mediation analysis was conducted. The results of this analysis can be found in table 3. Adolescent gaming behavior at T1 did not significantly predict the quality of communication about gaming between adolescents and parents at T1 (Beta = -.084, p = .149). When we did not take the adolescent-parent relationship at T1 into account, the quality of communication about gaming seemed to be a significant predictor of the adolescent-parent relationship at T2 (Beta = -.128, p = .027). However, when we did account for the adolescent-parent relationship at T1, the quality of communication about gaming at T1 did not significantly predict the adolescent-parent relationship at T2 (Beta = -.044, p = .393). Furthermore, the predicting value of adolescent gaming on the adolescent-parent relationship when the quality of communication about gaming is included as a mediator is almost equal to the predicting value when not including this mediator (Beta = .047, p = .357).

Since none of the paths in this mediation analysis were significant, we can conclude that the quality of communication about gaming between adolescents and their parents is not a mediator in the relationship between adolescent gaming behavior and the adolescent-parent relationship. Therefore, the hypothesis that quality of communication about gaming had a mediating effect on the relationship between adolescent gaming behavior and the adolescent-parent relationship over time was rejected.

Table3 Mediation analysis of Quality of Communication about gaming

Path	St.		
	Beta	p	CI
Gaming T1 → Relationship T2	.050	.327	-.003 - .010
Gaming T1 → Communication T1	-.084	.149	-.020 - .003
Communication T1 → Relationship T2	-.044	.393	-.101 - .040
Gaming T1 → Relationship T2 with Communication T1 as mediator	.047	.357	-.004 - .010

***Mediation Analysis – Arguments between Adolescents and Parents***

In order to find out whether arguments between adolescents and parents was a mediator in the relationship between adolescent gaming behavior and the adolescent-parent relationship, a second three-step mediation analysis was carried out. The results of the three-step mediation analysis with arguments between adolescents and parents as a possible mediator can be found in table 4.

Adolescent gaming behavior at T1 did not significantly predict arguments between adolescents and parents at T1 (Beta = .112, p = .054). When we did not take the adolescent-parent relationship at T1 into account, arguments seemed to be a significant predictor of the adolescent-parent relationship at T2 (Beta = 0.378, p < 0.001). However, when we did account for the adolescent-parent relationship at T1, arguments at T1 did not significantly predict the adolescent-parent relationship at T2 (Beta = -.032, p = .714). Furthermore, the predicting value of adolescent gaming on the adolescent-parent relationship when arguments between adolescents and parents is included as a mediator is almost equal to the predicting value when not including this mediator (Beta = .050, p = .334).

Since none of the independent variables in this mediation analysis were significant predictors for the dependent variables, we can conclude that the amount of arguments between adolescents and their parents is not a mediator in the relationship between adolescent gaming behavior and the adolescent-parent relationship. Therefore, the hypothesis that arguments between adolescents and parents had a mediating effect on the relationship between adolescent gaming behavior and the adolescent-parent relationship was rejected.

Table 4 Mediation analysis of Arguments between adolescents and parents

Path	St.		
	Beta	p	CI
Gaming T1 → Relationship T2	.050	.327	-.003 - .010
Gaming T1 → Arguments T1	.112	.054	.000 - .019
Arguments T1 → Relationship T2	-.032	.714	-.165 - .113
Gaming T1 → Relationship T2 with Arguments T1 as mediator	.05	.334	-.004 - .010

## **Discussion**

The current study aimed to examine the relationship between adolescent gaming behavior and the adolescent-parent relationship and the possible mediating effect of the quality of communication about gaming and the possible mediating effect of arguments between adolescents and parents. We found proof that a relationship between adolescent gaming behavior and the adolescent-parent relationship exists over time. Regression analysis showed that adolescent gaming behavior does not predict the adolescent-parent relationship over time. There is also no proof that the quality of communication about gaming can explain the relationship between adolescent gaming behavior and the adolescent-parent relationship. Neither is there proof that arguments explain the relationship between adolescent gaming behavior and the adolescent-parent relationship.

### ***Discussion of Results***

The current study found a correlation between adolescent gaming behavior and the adolescent-parent relationship over time. More severe adolescent gaming behavior seems to be related to a weaker adolescent-parent relationship in some way. This is in line with the theories supporting that more excessive or problematic adolescent gaming behavior is associated with a weaker adolescent-parent relationship, as discussed by DaCharlie et al. (2011), Richards et al. (2010) and King et al. (2017). However, regression analysis showed that adolescent gaming behavior is not a significant predictor for the adolescent-parent relationship. Therefore, the main hypothesis of this research paper must be rejected.

### ***Mediating Effect of the Quality of Communication about Gaming***

When we take a look at the results of the analysis with the quality of communication about gaming as a possible mediator, we see that we did not find any evidence that supports that the quality of communication is a mediator in the relationship between adolescent gaming behavior and the adolescent-parent relationship over time. There is no proof that a more severe level of adolescent gaming behavior causes a lower quality of communication about gaming. Secondly, there is no proof that a lower quality of communication about gaming causes a weaker adolescent-parent relationship over time. These findings are not consistent with the literature that suggests that a higher amount of gaming diminishes the communication and increases distance within the family by Bonnaire et al. (2019) and King et al. (2017). Neither are the results of the current study in line with the literature suggesting that

frequent and open positive family communication makes it more likely that parents and adolescents will have a good relationship by White (2000) and Olson et al. (1983).

A possible alternative explanation for our findings could be that the gaming adolescent conceals their gaming behavior from their parents by not talking about the gaming behavior in order to prevent parental disapproval (Smetana, 2009). Research suggests that parental mediation of gaming behavior is highly dependent on the attitudes parents have towards gaming (Bonnaire et al., 2017). Therefore, it could be the case that adolescents who know their parents' attitudes towards gaming are negative are not likely to share much about the amount of games they play or the content of the games they play to prevent conflict. In order to find out whether this is indeed a correct explanation for the results found in this research, more research on parental attitudes towards gaming and its effects on communication about gaming is necessary.

### ***Mediating Effect of Arguments between Adolescents and Parents***

When looking at the results of the analysis with arguments between adolescents and parents as a possible mediator, we can conclude that arguments do not have a mediating effect on the relationship between adolescent gaming behavior and the adolescent-parent relationship over time. We did not find proof that a more severe level of adolescent gaming behavior causes more arguments between adolescents and their parents. Secondly, more arguments between adolescents and parents do not cause a weaker adolescent-parent relationship over time. This is not in line with the theory about the effect of video games on arguments by Shek et al. (2019) and the theory about arguments and its effect on relationships by Barber et al. (1994) and Moneta (1986).

A possible alternative explanation for the finding that more arguments do not cause a weaker adolescent-parent relationship is the fact that arguments can help adolescents and parents express their emotions and work through several different problems together, resulting in a stronger adolescent-parent relationship (Jonassen, 2010). Research showed that arguments often arise out of a desire to maintain or dissolve a relationship, to persuade, and to understand a position throughout interpersonal discussion (Stein et al., 2001). In order to find out more about the role of arguments between adolescents and parents when it comes to gaming, more research is needed.

### ***Methodological Limitations and Strengths***

The current study has a variety of methodological limitations and strengths that are important to take into consideration when interpreting the results. One of the most important limitations is the fact that it could be the case that participants intentionally manipulate their answers, because it adolescents who show more extreme gaming behavior could be ashamed of the fact that they game a lot. Another limitation is the fact that a questionnaire is always a so-called 'snapshot', which means that a lot of answers to the different items could vary a lot over time. For example, the amount of hours an adolescent plays videogames can vary per week, depending on how busy the adolescent is with other activities, such as school and social activities. Another important limitation could be the fact that the DiYo-questionnaire was filled in by only adolescents and not their parents. Data about the home environment and arguments between adolescents and parents may therefore not be completely accurate. Another limitation of this study is the fact that the amount of arguments between adolescents and parents was measured through an item of the Family Environment Scale (Moos, 1994), which also measured the adolescent-parent relationship. Therefore, there could have been some overlap between the variables of arguments between adolescents and parents and the adolescent-parent relationship.

Next to some limitations, this study also had important strengths. The main strength of the current study is the fact that it is longitudinal. So far, most studies on gaming and family dynamics have been cross-sectional. Since longitudinal data makes it possible to detect causal relationships, this could be helpful in detecting what the relationship between adolescent gaming and the adolescent-parent relationship looks like. Other than that, the representative sample that was used for this study is also a strength. The sample was relatively big and included all ages within the range and all school levels in the Netherlands. The final strength worth mentioning is the fact that the DiYo-questionnaire is anonymous. This often makes it easier for participants to be honest about their answers to the used items.

### ***Recommendations for future research***

Since gaming is still growing in popularity and a lot is still unclear about the consequences, more research on the topic is necessary. A lot of former research has found that gaming is in some way related to the adolescent-parent relationship. However, a lot is still unclear on what this relationship looks like and what possible other factors come into play. Therefore, a larger body of longitudinal research on this topic would be beneficial. Other than that, it is also unclear what other factors could have an important impact on adolescent gaming behavior and the adolescent-parent relationship. Therefore, it would be interesting to

examine the effect of more different possible influential factors. Interesting possible influential factors for future research may be the family's socioeconomic status, mental health and wellbeing.

### ***Conclusion and possible implications***

The results that were found in the current study provide some information about the relationship between adolescent gaming behavior and the relationship between adolescents and their parents. A correlation between the two over time was found, but it is not yet clear what this relationship looks like and what other possibly influential factors come into play. To gain more insight in the possible effects of gaming on the adolescent's life, more research is needed. The information in this paper could be a simple base and an inspiration for further research.

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