Parental mediation, children's self-control and their social media use

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CONTENTS

Abstract

Background: Parents believe that children's intense social media use might negatively affect their academic performance and their well-being because of addictive like behaviors presented, that's why, parents use some parenting strategies (restrictive mediation and active mediation) to decrease children's social media use. It is crucial to investigate whether parenting practices are effective to reduce children's social media use and which mechanisms may intervene in the relationship between them. In our paper, we will focus whether children's self-control mediates the relationship between (parental) restrictive mediation and children's intense social media use. Furthermore, we tried to depict if active mediation in addition to restrictive mediation contributed to children's social media use. ***Methods:*** Children aged between 9-18 years old (*N*=404) completed 4 questionnaires as being the Reactive Restrictions Scale, Parenting Style inventory II, Self-control Scale and Intensity of Social Media Use Scale in an online environment. To test the mediation effect of children's self-control between restrictive mediation and children's social media use, we conducted multiple regression analysis using Baron and Kenny's (1986) statistical method. Also, to see active mediation's contribution on children's social media use, we conducted hierarchical regression analysis. ***Results:*** We concluded that children's self-control partially mediates the relationship between restrictive mediation and children's social media use, also, we observed that active mediation could not significantly contribute to the children's social media use next to restrictive mediation. ***Discussion:*** Our results contradicted what the *self-control theory* argued (Gottfredson and Hirschi, 1990) and demonstrated that the higher children are exposed to restrictive mediation, the lesser self-control they would have. Moreover, it is important to present that when parental restrictive mediation increases, children use more social media which indicates the strict parenting rules might not help to decrease children's social media use. Even though we could not find a significant effect of active mediation next to restrictive mediation, for the future researches, looking to the main effect of it would be valuable.

Keywords: Restrictive mediation, active mediation, children's self-control and children's social media use

1. Introduction

1.1. Problem Description

Social media has become increasingly integrated into the daily lives of people because it offers many options for social interaction that we cannot reach in the physical word. Compared to adults, young people spend more time on social media. This is understandable because when children grow into adolescence, peers and other people around them become increasingly important in their lives. Therefore, social media use fulfills their need to have social interactions (Deci & Ryan, 2012). However, children's intense social media use may also become a concern.

Children are frequently exposed to instant messages and notifications though various social media platforms. These attentional demands make children to frequently access to social media platforms and spend a lot time in there. Children can find it challenging to balance short-term pleasures that social media offers and the potential costs of it for their long-term goals, in other words, it can create self-control failures. Therefore, social media use may become a source of distraction and task delay for children (David, Kim, Brickman, Ran, & Curtis, 2015). As a result, intense use of social media might negatively affect children's academic performance (Van Den Eijnden et al., 2018). It is important to note that there is no agreement about which criteria makes the social media use 'intense', 'compulsive', 'disordered', 'problematic' etc. and there is also a lack of valid psychometric scales to measure the phenomenon of intense social media use (Bányai et al., 2017). Some researchers measure intense social media use within the scope of addiction (Social Media Addiction Scale; Van Den Eijnden et al., 2016), some assess it with the time spent on social media (Van Den Eijnden et al., 2018). In this context, there are various cross-sectional studies in the literature that show the association between intense social media use and decreased school performance (Pasek & Hargittai, 2009; Kirschner & Karpinski, 2010; Jacobsen, & Forste, 2011; Paul, Baker & Cochran, 2012; Karpinski et al., 2013; Al-Menayes, 2014). Furthermore, a longitudinal study (Van Den Eijnden et al., 2018) confirmed that excessive social media use might predict lower school performance. So, the evidence on the link between intense social media use and lower academic performance seems quite apparent.

In addition to the decreased school performance, intense social media use can be linked to (or develop into) an addictive like behavior (Griffiths, Kuss & Demetrovics, 2014).

Parents worry about whether intense social media use can negatively affect their children's well-being; which may not be unwarranted. For instance, Kelly, Zilanawala, Booker, & Sacker (2018) focused on potential explanatory pathways for decreased levels of well-being after excessive social media use which is measured by hours spent in the social media. They retrieved data from the UK Millennium Cohort Study which had a large sample (*N*=10,904, 14 years old adolescents). They found that high social media use is correlated with depressive symptoms which imply poor mental health and well-being. Even though many existing studies tried to show the relationship between intense social media use and poor mental health & well-being, they are characterized by methodological limitations, like inadequate control for mental health history or selection effects (Kelly et al., 2018; O'Reilly et al., 2018; Van Den Eijnden et al., 2018). So, the evidence of the impact of social media use on well-being is less clear.

To conclude, despite the fact that social media is useful for children to initiate new forms of communication and have social connection with others (Baker & Moore, 2008), there is a growing concern among parents that intense use of social media might lead their children to show lower levels of academic performance and might impair their well-being. This common perspective makes parents engage in their children's social media use through parental rules and various interventions (e.g. parent-child conversations about social media use). In addition, we believe that self-control ability of children may be an important factor in their social media use because self-control is a crucial resource for children to balance short-term desires and long-term goals as we stated above. We hypothesize that the relationship between parental interventions and children's social media use can be mediated by children's self-control. In the following paragraphs, we are going to explain what made us to hypothesize this mechanism.

1.2. The impact of parenting on children's intense social media use

In the literature, the interaction parents have with their children about social media use is commonly referred with the term of 'parental mediation'. Two types of parental mediation are seen including *restrictive mediation* (parental rules regarding time spent and/or the social media contents) and *active mediation* (parent-child discussion about the social media use & contents) (Valkenburg, Krcmar, Peeters, & Marseille, 1999). Some cross-sectional studies revealed that restrictive mediation is correlated with less social media use (Kalmus, et al., 2015; Van Rooij & Van den Eijnden, 2007) whereas other cross-sectional researches found

no significant relationship between the two (Daud et al., 2014). Furthermore, there are studies which even showed a positive relationship between restrictive mediation and children's social media use. For instance, Sasson & Mesch (2014) presented that as restrictive mediation increases, children's online risky behaviors (e.g. posting personal details online) also increase. Moreover, Collier et al. (2016) conducted a meta-analysis taking into account 57 studies and investigated how various parental mediation types affect children's media use. They found a significant relationship between restrictive mediation and children's media use, however, they did not argue for a clear direction of the relationship because of the mixed results. It is shown that some studies found that restrictive mediation may be a useful tool to decrease children's media use, some cannot find clear pattern and some presented adverse effects of restrictive mediation. In terms of active mediation, Collier et al. (2016) could not find a significant relationship between active mediation and children's media use.

Active mediation is mainly defined as talking with children about social media contents in order to help children to become a critical consumer of social media. Contrary to the findings from the meta-analysis run by Collier et al. (2016), some studies argue that higher levels of parent-child conversations about the social media use are significantly associated with lower levels of social media use (Kalmus et al., 2015). Even though there are inconsistent results about the effect of active mediation on the children's social media use, in the literature, active mediation's effect is less apparent comparing to restrictive mediation's effect on children's social media use. That's why, later studies tested active mediation in multivariate analysis as being added to restrictive mediation (Symons et al., 2017). In other words, they investigated whether active mediation plays a significant role in addition to the effects of restrictive mediation. Therefore, in our research, we also decided to test the possible added value of active mediation.

It is crucial to discuss whether gender is a significant confounder between parental mediation and children's social media use. Koning et al. (2018) demonstrated that more frequent parent–child communication about Internet (active mediation) leads to more Social Media Disorder (SMD) symptoms among boys. On the other hand, more restrictive rules leads to fewer SMD symptoms for girls. Koning et al. (2018) explained the gender difference with the *self-control theory* (which we will explain it in the following sections) arguing that parents apply stricter rules to girls more than boys and it causes girls to have more self-control abilities. Even though they do not explicitly argue self-control as being one of the

important variables in the relationship among the parental mediation types and social media use, it may indicate a mediation effect of self-control on them.

Furthermore, Collier at al. (2016) argued age might also be another important confounder based on the *self-determination theory*. Self-determination theory mainly states that human behavior is driven by the three main human needs as being *autonomy*, *competence* and *relatedness*. Restrictive mediation might intervene the children's need of being autonomous especially for adolescents because they might have stronger needs to be autonomous. Therefore, restrictive mediation may not be an effective way to prevent adolescent's higher levels of social media use. At that point, as children grow into adolescents, having conversation about the social media use (active mediation) can give them more autonomy to decide on their actions and it may have an significant effect on their social media use. So, age can be important factor for parents to decide which type of parental mediation to apply towards their children's social media use. So, it is important to highlight that when focusing on the relationship between parental mediation and children's social media use, gender and age might be important confounders to investigate.

1.3. Self-control as explanatory factor in relationship between parenting and intense social media use

Until this point, we tried to present the possible impact of parental mediation (restrictive and active mediation) on children's social media use. We highlighted that there might be some confounders such as age and gender, but we did not mention yet what mechanisms may explain this relationship. Li, Li & Newman (2013) was one of the first researchers who conducted a research with 694 adolescents focusing on whether children's self-control mediates the relationship between (parental) restrictive mediation and children's problematic internet use. Children were requested to fill-out different scales related to restrictive mediation, children's self-control, and their problematic internet use. Researchers showed that restrictive mediation is found to be negatively associated to children's problematic internet use. In other words, when parents imply restrictive mediation, children show lower levels of problematic internet use. Moreover, Li, Li & Newman (2013) presented that self-control partially mediates the relationship between restrictive mediation and children's problematic internet use after controlling gender, age and family financial status. However, there are two points that we find problematic related to their work. Li, Li & Newman (2013) measured restrictive mediation as not being directly related to children's

internet use (e.g. “How often do your parents require you to ask for their permission before you go out after school?”; Wang, Pomerantz, & Chen, 2007). For instance, a parent can present rules towards children’s internet use but not to their behaviors related to ‘ask permission’. We believe that parental rules towards other areas may not be generalized to the restrictive mediation specific to internet use. Secondly, Li, Li & Newman (2013) assessed problematic internet use with items like “Do you use the Internet as a way of escaping from problems or of relieving an unhappy mood?” (Young, Yue & Ying, 2011). So, they used addictive tendencies to measure adolescents’ problematic internet use. As we stated before, operationalization & measurement of problematic internet use are not agreed in the literature but we believe quantitative measures (like time spent on the internet) should be incorporated in the measurement to have more valid results. In addition to Li, Li & Newman’s (2013) study, as we stated above, we want to check whether active mediation have an added value next to restrictive mediation.

1.4. Understanding self-control

We come to the point that what is self-control and why & how it may have a relationship with parenting and social media use. Self-control is defined as the ability to opt for the long-term outcome, “in circumstances in which short-term gain is pitted against long-term greater gain” (APA Dictionary of Psychology, 2007). In other words, people show self-control when they accept short-term aversive consequences in order to gain delayed reward (e.g. physical exercise for chronic pain patients). Cognitive neuropsychologists characterize self-control with a intrapsychic conflict between short-term desires and higher-order goals (Botvinick et al., 2001; Carter & Van Veen, 2007). Desire is explained as the state of wanting and it directs a person towards immediate reward related stimuli. Unlike desires, higher order goals are often pursued intentionally and associated with long-term benefits. Let’s think about a child who will take an exam the day after. S/he wants to chat with friends through social media (which can be considered as the immediate reward related stimuli) because it fulfills the child’ need for connectedness (Deci & Ryan, 2012). However, s/he needs to study for the exam to get a satisfying grade (higher-order goal). If s/he has low level of self-control, we would expect him/her to chat with friends instead of studying. If s/he presents high levels of self-control, she would rather study.

Mischel and their colleagues are seen as the pioneers of the self-control research and they are the ones who conducted the famous Marshmallow test (Mischel & Ebbesen, 1970). In the experiment, the pre-school children were offered a choice between one small but immediate reward (1 marshmallow), or two small rewards (2 marshmallows) if they waited for a period of time. Afterwards, the researcher left the room for about 15 minutes and then returned. In various follow-up studies, children who were able to 'delay gratification' (wait for the second marshmallow) are found to have better life outcomes: better SAT (Scholastic Aptitude Test) scores (Shoda et al., 1990), higher self-worth, self-esteem and higher ability to cope with stress (Ayduk et al., 2000) and healthy Body Mass Index (BMI) (Schlam et al., 2013). We see that high self-control during childhood is associated with better later-age life outcomes. On the other hand, low self-control is shown to be associated with negative behaviors: unhealthy eating behaviors, substance abuse, impulsive buying, and procrastination (Baumeister & Heatherton, 1996; Claes et al., 2006; Patton, Stanford, & Barratt, 1995; Vohs & Faber, 2007). Based on the relationship between low levels of self-control and these distinct negative behaviors, we believe that children's differentiated levels of self-control and their social media use can also be associated.

From another perspective, Gottfredson and Hirschi (1990) argued that low levels of self-control may be associated with impulsive behaviors. They are the ones who came up with the *self-control theory* and attracted attention in the academic community. They see lack of individual self-control as an important predictor of criminal behavior. Moreover, Gottfredson and Hirschi (1990) formed a theory on where the self-control comes form. They believe, the level of self-control is the consequence of the degree of effective parenting that a child receives. They see, the ineffective parental management as the cause of low self-control. Surprisingly, they do not assess genetic factors as a possible cause, they state that change to parenting is on its own responsible for the level of self-control. Effective parenting is described as exercising direct social control over the child. They argued that if the parents apply social control over the child, their child would acquire self-control ability.

After *self-control theory* was postulated, many researchers wanted test its accuracy. The first part of their theory, the significant correlation between the levels of self-control and criminal behaviors was evidenced by many studies (Pratt & Cullen, 2000; Baron, 2003). However, there is mixed data about the second hypothesis of the theory which argues there is a significant relationship between effective parenting and children's level of self-control.

Hay and Forest (2006) conducted longitudinal research with 3793 teenagers aged between 7 to 15. They measured effective parenting with a composite scale that incorporates aspects of parental control and parental warmth. They found that higher levels of effective parenting are correlated with the higher levels of self-control and the relationship continues to exist in later ages of children (found to be the strongest at the age of 15). On the other hand, Unnever, Cullen and Platt (2003) decided to measure effective parenting with parental monitoring. They used the data of 2472 middle school students (grades 6, 7 and 8) in Virginia to assess the relationship between parental monitoring and the self-control. They found a significant relationship between the two. In line with Unnever et al. (2003)'s study, Lynskey et al. (2000) studied parental monitoring alone with 5936 eight grade students to see its relations to self-control and they presented the significance.

Moreover, Hay (2001) used multiple measurement to assess the effective parenting with 197 urban American high school students, aged between 14 to 18. Parental monitoring, parental discipline, combined monitoring and discipline scale and authoritative parenting style were separately used to measure effective parenting. The results revealed significant relationships between parental monitoring and self-control; combined monitoring and discipline scale and self-control; and authoritative parenting style and self-control. However, there were no significant correlation between parental discipline and self-control. Like Hay (2001), Wright & Beaver (2005) used multiple variables (parental involvement, parental withdrawal, parental affection, physical punishment and family rules) to measure effective parenting. They conducted a longitudinal study with 1000 kindergarten students. They showed that parental involvement, parental withdrawal and parental affection were related to self-control, however, this was not the case for physical punishment and family rules. We believe that inconsistent findings from the literature might be because of varied operationalization of effective parenting.

To conclude, Li, Li & Newman (2013) showed a partial mediation effect of children's self-control between restrictive mediation and children's problematic internet use. However, we think that there are limitations regarding to the operationalization & measurement of the main variables as we discussed above. We want to contribute to the literature with different operationalization & measurement of the main variables and look whether active mediation also play a role in the mechanism. After statistically controlling for the effects of gender and age, we expect that self-control mediates the relationship between restrictive mediation and

children's social media use. Due to the mixed data, we do not have a hypothesis related to the directions of the relationships among the three variables (restrictive mediation, children's self-control and children's social media use). Moreover, there is scarce literature on the basis of whether active mediation has a significant impact on the already existing relationship. We hypothesize that active mediation has a significant added value for the model based on Symons et al.'s (2017) findings. For our research, we have 5 main research questions: The first one is: (1) Does restrictive mediation predict children's social media use? Secondly, (2) is there a significant relationship between children's self-control and their social media use? To test Gottfredson and Hirschi (1990)'s *self-control theory,* (3) is restrictive mediation significantly related to children's self-control? Based on these research question, (4) does children's self-control mediate the relationship between restrictive mediation and children's social media use? Lastly, (5) does active mediation have a significant added value for the existing model?

1.5. Scientific & social relevance and interdisciplinary

While working on the relationships among parental mediation, children's self-control and their social media use, an interdisciplinary approach was used. Our research focuses on the relationships which are concerned by different disciplines. *Self-control theory* by Gottfredson and Hirschi (1990) comes from criminology whereas self-control as a term is mostly researched by cognitive psychologists. Moreover, the relationship between parenting and children's social media use is concerned by the field of developmental psychology. In addition, intense social media use in itself is a public health concern because the field of public health does not only focus on protecting physical health of people but also promotes their mental well-being. From this perspective, our paper aims to find ways to contribute children's well-being reducing the adverse effects of children's intense social media use on their academic performance because being academically unsuccessful may lead children to have negative self-image (e.g. low self-esteem). In terms of social relevance, if we can scientifically show the significant relationships among the variables, we can come up with effective tools & interventions to prevent children's intense social media use. There is a scarcity of articles focusing on the possible effect of self-control, so, we believe our research will contribute the gap in the literature. In that way, we can take steps to create interventions to foster parents to learn more appropriate parenting practices regarding to their children's social media use.

2. Methods

2.1. Research design

Data were retrieved from the Digital Family Study (Geurts, Koning, Vossen & Van Den Eijnden). This is a cross-sectional study and the study included neither any interventions nor experimental groups.

2.2. Participants

404 children attending primary or secondary school participated in the study. 9 participants' data were excluded (participants who are older than 18 years old (n = 1) and participants with missing data (n = 8). The final sample consisted of 395 participants aged between 9 and 18 years old (M = 13.49, SD = 2.14). 96.5 % of the sample was Dutch. In terms of gender distribution, 45.8 % of the participants were male while 54.2 % were female.

2.3. Recruitment and Procedure

Participants were recruited from different channels (e.g. social media and personal channels). Also, some schools were asked to share the information about the study in their newsletters. Data collection proceeded from the end of the April 2020 to the beginning of July 2020.

The participants who agreed to participate the study received an email with the link to an online questionnaire. Before all participants started to fill-out the questionnaires, they were presented an information text which covered the aims of the study; prerequisites for participation; privacy and confidentiality; financial compensation; and contact information for questions. For the children who were younger than 16, their parents' consent was mandatory. Completing questionnaires took around 25 minutes. As compensation, participants received a € 5 gift-voucher. Data collection was approved by the Ethics Committee of the Faculty of Social and Behavioral Science at Utrecht University (FETC20-192).

2.4. Materials

The Digital Youth Study included 37 questionnaires in total. For our research, we used responses taken from 4 questionnaires:

2.4.1. Parental mediation

2.4.1.1. Restrictive mediation

Restrictive mediation was measured with the Reactive Restrictions Scale (Koning, Peeters, Finkenauer, & Van Den Eijnden, 2018). The Reactive Restrictions Scale (Koning et al., 2018) consists of 4 items (e.g. “How often do your parents react that you have to turn off the computer/tablet or smartphone?”.). The scale was rated on a 5 point-scale (1= never, 2= a few times in a week, 3= 1-2 times a week, 4= 3-5 times a week, 5= more than 5 times a day). We took the mean of the 4 items (range from 1 to 5). Higher scores represented higher levels of restrictive mediation towards children’s social media. Cronbach’s alpha for this scale is .84.

2.4.1.2. Active mediation

In the Digital Youth Study, there was no scale directly intended to measure active mediation. We believe that active mediation is a part of an autonomy-granting parenting style, parents who tend to discuss the topics related to social media contents & use with their children, seem to grant their children more autonomy. Therefore, we decided to use items from the Parenting Style inventory II (Darling & Toyokawa, 1997) as proxy for active mediation. These 4 items of the scale are designed to measure autonomy-granting parenting style. There were items like “My parent(s) (or caregivers) believe I have a right to my own point of view.” and responses are rated on 5 point-scale (1= totally disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= totally agree). The tenth item of the scale was recoded and we took the mean of 4 scores to measure autonomy-granting parenting scale and we coded it as active mediation. Cronbach’s alpha for this scale is .69.

2.4.2. Children’s self-control

Children’s self-control was assessed with the short version of the Self-control Scale (Finkenauer, Engels, & Baumeister, 2005). It consists of 9 items (e.g. “I have a hard time breaking bad habits.”, “I change my mind fairly often.”). The questionnaire was rated on a 5

point scale (1= totally not true, 2= not true, 3= sometimes true sometimes not true, 4= true, 5= totally true). We recoded the scores taken from all questions except question 5, calculated the means of all answers and obtained self-control score for each children (range from 1 to 5). Higher scores depict higher levels of self-control. Cronbach's alpha for the this scale is .69.

2.4.3. Children's social media use

Children's social media use was measured with the Intensity of Social Media Use Scale (Van Den Eijnden et al., 2018). It includes 5 items (e.g. "How many times a day do you check social network sites (e.g., Instagram, Facebook, YouTube, Pinterest, Discord or Twitter)?"). Passive social media use was measured by 2 items and active social media use by 3 items. Participants answered first 2 items in a different way (1= Never or less than once a day or week; 2= 1-2 times a day or week; 3= 3-5 times a day or week; 4= 6-10 times a day or week; 5= 11-20 times a day or week; 6= 21-40 times a day or week; 7= more than 40 times a day or week) than the last 3 items (1= Less than once a day; 2= 1-5 times a day; 3= 6-10 times a day; 4= 11-20 times a day; 5= 21-40 times a day; 6= 41-80 times a day; 7= more than 80 times a day.) We took the sum of responses taken from the questionnaire. Higher scores (range from 5 to 35) presented higher levels of social media use. Cronbach's alpha for this scale is .78.

2.5. Statistical Analysis

For running all the statistical analyses, we used SPSS software. The threshold for the significance was taken alpha level of .05. When the alpha is less than .05, the null hypothesis was rejected.

After performing descriptive statistics, we conducted t-tests to see how gender affects the existing variables, also, we conducted Kendall's tau-b tests to observe how age correlated with the variables. Following to the preliminary analyses, we ran two different regression analyses. We know that in order to run linear regression, there is several assumptions that data should satisfy. Therefore, we checked the assumptions of normality, linearity, homoscedasticity, normality of residuals, multicollinearity and Cook's distance (for extreme outliers). Following the assumption tests, we continued to run the analyses.

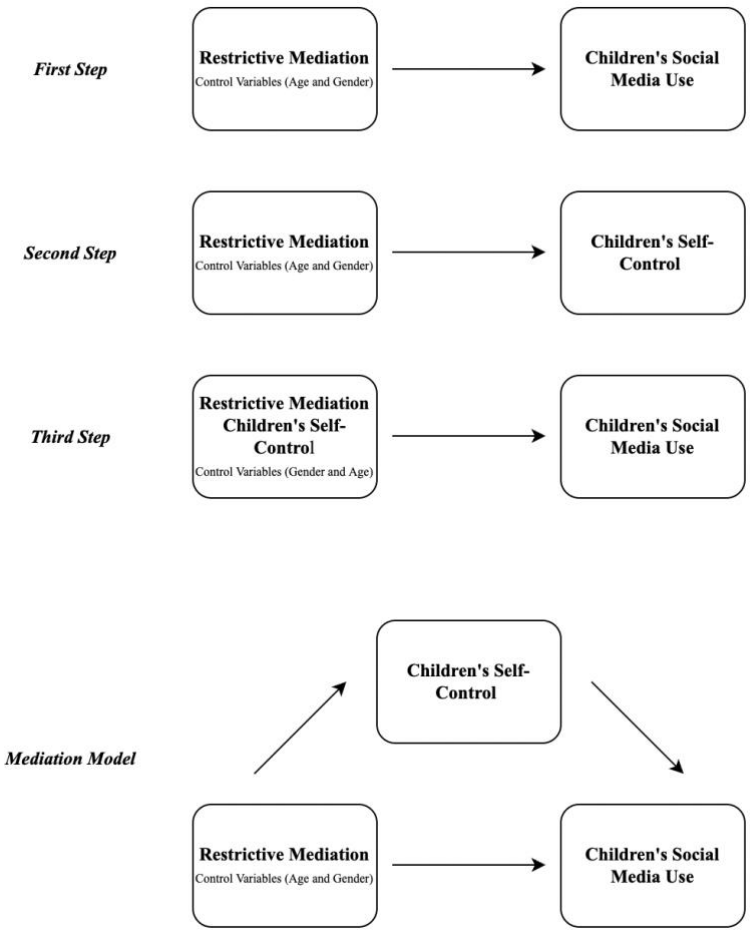

Figure 1 - The statistical analysis steps for mediation analysis

For the first analysis, we used Baron & Kenny's method (1986) to see whether children's self-control mediates the relationship between restrictive mediation and children's social media use. At the first step, we conducted a linear regression, restrictive mediation as being predictor variable and children's social media use as being dependent variable (see *Figure 1*). At the second step, we kept restrictive mediation as predictor variable and we put children's self-control as criterion variable (see *Figure 1*). For the last step, we put both restrictive mediation and children's self-control in the independent variable column and put the children's social media use in the dependent variable column (see *Figure 1*). For all three steps, we put children's age and gender in the independent variable column to control their effect on the analyses. After going through the steps, if we present significant results for all three regression analysis, we can conclude that there is a mediation effect.

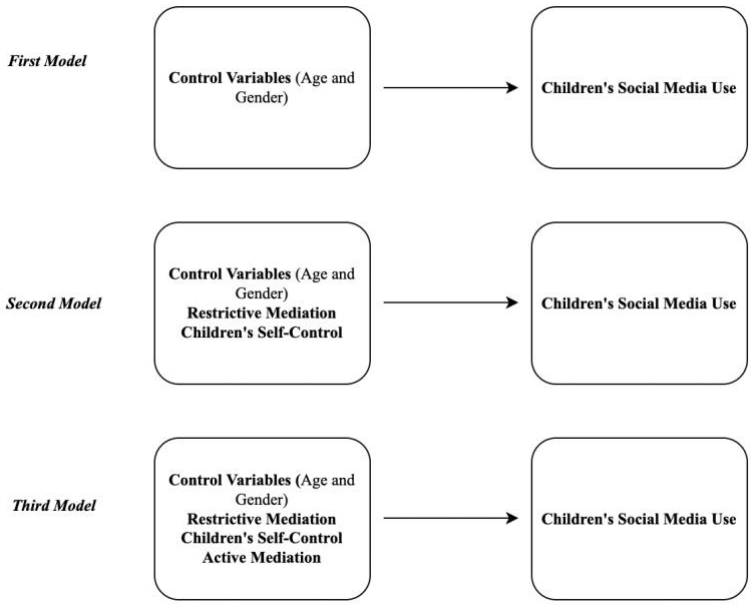

Figure 2 - Hierarchical Regression Models

To analyze the contribution of the active mediation, we decided to conduct hierarchical analysis by creating three different models. For the first model, we only decided to enter children's age and gender to control their effect (*see Figure 2*). We added restrictive mediation and children's self-control for the second model (*see Figure 2*). For the last model, we only added active mediation (*see Figure 2*). If the last model is significantly different than the second model, we can conclude that active mediation significantly contribute to restrictive mediation predicting children's social media use. If not, we can conclude saying that there is no added value of active mediation into the model.

3. Results

3.1. Preliminary analyses

Table 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	395	9	18	13.4911	2.14968
Restrictive Mediation	395	1	5	1.8601	.80245

Children' Self-Control	395	1.44	4.78	3.1907	.56662
Children's Social Media Use	395	6	35	18.1102	6.05308
Active Mediation	395	1.5	5	3.9924	.62944
Valid N (listwise)	363				

Descriptive statistics revealed that children's responses in terms of restrictive mediation varied from 1 to 5 (*M*=1.86, *SD*=.80) while active mediation scores were seen between 1.5 to 5 (*M*=3.99, *SD*=.62). For children's self-control, the responses lied between 1.44 and 4.78 (*M*=3.19, *SD*=.56). Lastly, the scores for children's social media use varied from 6 to 35 (*M*=18.11, *SD*=6.05).

Table 2

Independent Samples Test

		Levene's Test for Equality of Variances		*t*-test for Equality of Means				
Restrictive Mediation		F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean Difference	Std. Error Difference
	Equal variances assumed	7.553	.006	3.750	393	<.001	.29897	.07972
	Equal variances not assumed			3.688	347.441	<.001	29897	.08106
Children's Self-Control	Equal variances assumed	.107	.744	3.855	393	<.001	.21678	.05624
	Equal variances not assumed			3.855	381.536	<.001	.21678	.05626
Children's Social Media Use	Equal variances assumed	.049	.824	-1.710	361	.088	-1.09095	.63781

	Equal variances not assumed			-1.711	343.277	.088	-1.09095	.63775
Active Mediation	Equal variances assumed	.032	.857	-1.830	393	.068	-.11600	.06337
	Equal variances not assumed			-1.828	379.836	.068	-.11600	.06347

Following to the descriptive statistics, to see gender impact on the existing variables, we run several t-tests. It is important to state that the homogeneity of variances assumption is satisfied for all analyses except the one with restrictive mediation. Therefore, for this variable, we stated the results of 'equal variances not assumed' version. The significant difference between girls and boys was seen on the reported restrictive mediation $t(347.44)=3.68$, $p < .001$. Boys ($M=2.02$) reported that they are exposed more restrictive mediation than girls ($M=1.72$). In terms of children's self-control, boys ($M=3.3$) reported significantly higher levels of self-control than girls ($M=3.09$), $t(393)=3.85$, $p < .001$. Moreover, girls ($M=18.59$) stated more social media use comparing to boys ($M=17.50$) but girls' and boys' social media use do not significantly differ from each other, $t(361)= -1.71$, $p=.08 > .05$. Lastly, for the exposed active mediation, girls ($M=4.04$) reported that they are exposed more active mediation than boys ($M=3.92$) but the difference was not statistically significant $t(393)= -1.83$, $p=.06 > .05$.

Table 3

Nonparametric Correlations

			Age	Restrictive Mediation	Active Mediation	Children's Social Media Use	Children's Self-Control
Kendall's tau_b	Age	Correlation Coefficient	1.000	-.232**	.045	.170**	-.085*
		Sig. (2-tailed)	.	<.001	.230	<.001	.020
		N	395	395	395	363	395
	Restrictive Mediation	Correlation Coefficient	-.232**	1.000	-.167**	.042	-.068
		Sig. (2-tailed)	<.001	.	<.001	.269	.063

		N	395	395	395	363	395
	Active Mediation	Correlation Coefficient	.045	-.167**	1.000	-.027	.174**
		Sig. (2-tailed)	.230	<.001	.	.484	<.001
		N	395	395	395	363	395
	Children's Social Media Use	Correlation Coefficient	170**	.042	-.027	1.000	-.151**
		Sig. (2-tailed)	<.001	.269	.484	.	<.001
		N	363	363	363	363	363
	Children's Self-Control	Correlation Coefficient	-.085*	-.068	.174**	-.151**	1.000
		Sig. (2-tailed)	.020	.063	<.001	<.001	.
		N	395	395	395	363	395

Table 4

Partial Correlations

Control Variables			Age	Children's Self-Control	Children's Social Media Use	Active Mediation	Restrictive Mediation
Gender	Age	Correlation	1.000	-.122	.239	.017	-.290
		Sig. (2-tailed)	.	.021	<.001	.751	<.001
		df	0	360	360	360	360
	Children's Self-Control	Correlation	-.122	1.000	-.181	.246	-.123
		Sig. (2-tailed)	.021	.	<.001	<.001	.020
		df	360	0	360	360	360
	Children's Social Media Use	Correlation	.239	-.181	1.000	-.068	.083
		Sig. (2-tailed)	<.001	<.001	.	.194	.114
		df	360	360	0	360	360
	Active Mediation	Correlation	.017	.246	-.068	1.000	-.177
		Sig. (2-tailed)	.751	<.001	.194	.	<.001
		df	360	360	360	0	360
	Restrictive Mediation	Correlation	-.290	-.123	.083	-.177	1.000
		Sig. (2-tailed)	<.001	.020	.114	<.001	.

	df	360	360	360	360	0

Also, we conducted many Kendall's tests (due to the non-normal data) to see the bivariate associations among the variables. Firstly, we observed that age and other existing variables are associated. We showed that there is a negative and significant association between age and restrictive mediation (τ_b = -.232, p <.001) even we control gender's effect the association remains significant (r = -.290, p <.001). In other words, the older age the children have, the less they are exposed to restrictive mediation. Similar to that, we observed a negative and significant relationship between children's age and their self-control (τ_b = -.085, p=.02 < .05) also, the relationship remains significant even if controlled for gender's impact (r = -.122, p =.02 <.05). There is shown a positive and significant correlation between children's age and their social media use (τ_b = .170, p < .001) and continues to be significant while controlling for gender's effect (r = -.290, p <.001). So, the older the children, the more they use social media. Lastly, there is positive but non-significant relationship between children's age and active mediation (τ_b = .045, p=.23 > .05).

3.2. Main Analyses

To check if the relationship between restrictive mediation and children's social media use is mediated by children's self-control, we intended to run 3 different regression analysis (Baron & Kenny, 1986). Before conducting the regression, we checked the related assumptions. At first, we checked the normality assumption for the four variables, which were: restrictive mediation (p < .001), active mediation (p < .001), children's self-control (p=.019 <.05) and children's social media use (p < .001). Kolmogorov Smirnov test depicted that these four variables do not meet the normality assumption. Knowing that data of the dependent variable should be normally distributed, we tried several techniques to make social media use data normal (Z-scores, taking square roots, logarithm 10), however, we could not succeed to transform the data into a normal distribution. Therefore, we used the original data for further analyses. Afterwards, the linearity assumption met looking to the plot of standard residuals against standard predicted values, no clear pattern was detected. Also, the homoscedasticity assumption was satisfied by the plot of standard residuals against standard predicted values. Normality of residuals was checked with the QQ plot of the residuals. Lastly, multicollinearity assumption was checked, VIF < 10 and Tolerance >.1. In terms of

outliers, standard residuals value should be between -3 and 3, and it is met, so we do not have any outliers that influence data, also, Cook's distance was <.1.

Table 5

Mediation Model

Model		Unstandardized Coefficient		Standardized Coefficient		
		B	Std. Error	*Beta*	*t*	*Sig*
1.	(Constant)	1.834	2.759		.665	.507
	Restrictive Mediation	1.286	.408	.169	3.155	.002
	Age	.847	.156	.286	5.440	<.001
	Gender	1.459	.624	.120	2.337	.020
2.	(Constant)	4.304	.232		18.536	<.001
	Restrictive Mediation	-.118	.036	-.167	-3.251	.001
	Age	-.038	.013	-.145	-2.874	.004
	Gender	-.244	.056	-.215	-4.338	<.001
3.	(Constant)	8.206	3.706		2.214	.027
	Restrictive Mediation	1.112	.410	.146	2.710	.007
	Children's Self-Control	-1.422	.557	-133	-2.551	.011
	Age	.781	.157	.264	4.984	<.001
	Gender	1.068	.638	.088	1.673	.095

1.Dependent Variable: Children's Social Media Use
2.Dependent Variable: Children's Self-Control
3.Dependent Variable: Children's Social Media Use

At first step, we conducted linear regression by locating restrictive mediation as predictor and children's social media use as criterion variable in the regression. Also, we added children's age and gender (as predictors) to control their effects on the analysis. Restrictive mediation ($b1$= 1.28, t= 3.15, p=.002 <.05), children's age ($b1$= .84, t= 5.44, p <.001) and gender ($b1$= 1.45, t= 2.33, p=.02 <.05) significantly and positively predicted children's social media use (see Table 1). Moreover, 9 % of the total variation of social media use could be explained by restrictive mediation, children's age and gender.

Secondly, we conducted linear regression by putting restrictive mediation in the independent variable column and children's self-control in dependent variable column in the regression. Also, we kept children's age and gender as predictors. Restrictive mediation ($b1$=

-.11, *t*= -3.25, *p* <.001), children's age (*b1*= -.03, *t*= -2.87, *p*=.004 <.05) and gender (*b1*= -.24, *t*= -4.33, *p* <.001) significantly contributed children's self-control (see Table 1). We see that as restrictive mediation increases children's self-control decreases, there is a negative relationship among the 2 variables. Moreover, we saw that 7.2 % of the total variation of children's self-control can be explained by restrictive mediation, children's age and gender.

In the last step of the mediation analysis, we entered restrictive mediation, children's self-control, children's age and gender as predictor variables while keeping children's social media as the criterion variable. Table 1 showed that restrictive mediation (*b1*= 1.11, *t*= 2.71, *p*=.007 <.05), children's self-control, (*b1*= -1.42, *t*= -2.55, *p*=.01 <.05) and children's age (*b1*= .78, *t*= 4.98, *p* <.001) predicted children's social media use while children's gender (*b1*= 1.06, *t*= 1.67, *p*=.09 >.05) could not. 10.6 % of the total variation could be explained by restrictive mediation, children's self-control, children's age and gender. We can conclude that children's self-control partially mediates the relationship between restrictive mediation and children's social media use. It confirms our first hypothesis.

Table 6

Coefficients

Model		Unstandardized Coefficient		Standardized Coefficient		
		B	Std. Error	*Beta*	*t*	*Sig*
1.	(Constant)	6.763	2.301		2.939	.004
	Age	.704	.151	.238	4.670	<.001
	Gender	1.079	.620	.089	1.740	.083
2.	(Constant)	8.206	.3.706		4.984	.027
	Age	.781	.157	.264	1.673	.001
	Gender	1.068	.638	.088	2.710	.004
	Restrictive Mediation	1.112	.410	.146	-2.551	<.001
	Children's Self-Control	-1.422	.557	-.133	.2.551	.011
3.	(Constant)	8.729	4.065		2.147	.032
	Age	.781	.157	.264	2.710	<.001
	Gender	1.084	.641	.089	-2.551	.092

	Restrictive Mediation	1.093	.415	.144	4.984	.009
	Children's Self-Control	-1.380	.573	-.129	1.673	.016
	Active Mediation	-.160	.509	-.016	-.315	.753

1. Predictors: (Constant), Gender and Age
2. Predictors: (Constant), Gender, Age, Children's Self-Control and Restrictive Mediation
3. Predictors: (Constant), Gender, Age, Self-Control, Restrictive Mediation and Active Mediation

Dependent Variable: Children's Social Media Use

For our last research question, we conducted hierarchical regression. In order to control children's age and gender, we put them into the first model. For the first model, children's age ($b1$=.70, t= 4.67, $p < .001$) significantly contributed to children's social media use while gender could not ($b1$=1.07, t= 1.74, p=.08 > .05) (see Table 2). We included restrictive mediation ($b1$=1.11, t= -2.55, $p < .001$) and children's self-control ($b1$=-1.42, t= 2.55, p= 01 < .05) into the second model and they significantly predicted the outcome variable. For the final model, we only added active mediation into the second model and we saw that one additional variable in the third block could not increase *R* Square in a visible way, it remained at .106. The Sig. *F* Change column presented that this increase is not significant, ($F_{(1,357)}$ = .09, p=.75 > .05). Therefore, we see active mediation does not significantly contribute to the existing model and it does not have a significant added value. The results falsify our second hypothesis.

4. Discussion

We verified our first hypothesis showing a partial mediation effect of children's self-control on the relationship between (parental) restrictive mediation and children's social media use. As we mentioned, Li, Li & Newman (2013) also presented partial mediation of children's self-control on the two variables and they found a negative relationship between restrictive mediation and children's social media use. Contrary to the relationship Li, Li & Newman (2013) had shown, we found that higher restrictive mediation that children are exposed, predicts higher levels of social media use, these are in line with Sasson & Mesch's (2014). Also, we found that the more parents present restrictive mediation, the lower children show self-control abilities. This is contradictory to what *self-control theory* of Gottfredson

and Hirschi (1990) argued. Gottfredson and Hirschi (1990) had claimed, if the children are exposed to effective parenting (direct social control over children), it would cause children to have higher levels of self-control. Our results do not support their theory. Moreover, we presented that if children's self-control is low, it leads higher levels of social media use. We achieved to show children's self-control as an important variable mediating the association between restrictive mediation and children's social media use.

It is also interesting to observe how gender and age plays a role in this mediation analysis. We found that boys are exposed more (parental) restrictive mediation comparing to girls and it contradicts what Koning et al. (2018) found. Koning et al. (2018) had showed, girls exposing more parental rules comparing to boys. In general, people tend to believe that girls are exposed to harsher rules but our findings showed the contrary. It shows the importance of questioning societal perceptions. Another thing that we saw was, when children grow up, restrictive mediation that parents apply to them decreases a lot.

Furthermore, we could not verify our second hypothesis which was expected significant added value of active mediation. It shows that talking to children about the social media contents they are consuming, do not change their social media behaviors. The fact that we could not find a significance might be because of the way we measured the active mediation. This is one of the big limitations that we had. We assessed active mediation with the autonomy-granting parenting style due to the lack of relevant questionnaires which directly measure active mediation. We know that there is a possibility that even though parents apply autonomy-granting style, they might not discuss the contents their children's consume at social media. We encourage further studies to replicate our study while measuring active mediation with a more valid and reliable scale. Second big limitation that we had was the non-normal data of children's social media use. Despite the fact that we run several tests to make the data normal, we could not achieve it and we can consider it as a big statistical limitation. As another limitation, the questionnaires were answered online and it created concerns for external validity. Many factors (music, weather condition or another distractive factor in the environment) can affect the way children respond the questionnaires. To increase external validity, it would be better to conduct the research at classroom environment or at a research lab if it is possible. Moreover, due to the design of the study, we could not look for any causation. Future longitudinal studies may be conducted to demonstrate whether parenting causes children to have any significant change in their social

media use. Lastly, it may have been interesting to see whether active mediation is a better way of increasing self-control, without restrictive parenting. We inspire future studies to investigate it.

We believe that our study is crucial in showing how parental rule-setting to children in terms of social media use may have an adverse effect on their social media use behaviors while most of the parents expect the contrary. As we showed, rule-settings is not an effective way to decrease children's social media use, it may be because what *self-determination theory* argued for. As we all need to feel that we are autonomous, the children also wants to experience it. When parents apply rules, they cannot feel that they are autonomous and in order to prove their autonomy, they tend to break the rules. We hope parents find our results important and consider not to apply rules in terms of their children's social media use. Lastly, as we discussed the possible associations among the variant levels of self-control and different set of negative behaviors of children (eating behaviors, substance abuse, impulsive buying, procrastination etc.), we intend to inspire future studies which question possible mediation effects of self-control between parenting and diverse negative behaviors of children.

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6. Appendixes

6.1.Questionnaires

Reactive restrictions towards social media/game use

General Information:

Name instrument	-
Number of items	4
Scales	1
Response options	1-(hardly) never; 2-a few times a week; 3- 1-2 times a day; 4- 3-5 times a day; 5-more than 5 times a day

Data collection across the waves:

Relationship direction	Wave 1	Wave 2	Wave 3	Wave 4
Adolescent about parents	X			
Time period specification				
Past two weeks	X			

Instruction + items:

The following questions are about how your parents (or caregivers) react if you want to (keep on) using the Internet or playing games. With using the Internet we also mean using your smartphone.

Think about the past two weeks. How often do your parents react ...

1. ...that you are not allowed to use the Internet or play games.
2. ...that you are only allowed to use the Internet or play a game for a short period of time.
3. ...that you have a certain time (e.g., 5 min) to use the Internet or play the game.
4. ... that you have to turn off the computer/tablet or smartphone.

Scale construction:

Scales	Items	Meaning
Reactive restrictions	MEAN(1, 2, 3, 4)	Higher scores represent higher levels of reactive restrictions towards adolescents' social media/game use.

Parenting style (responsiveness, demandingness, autonomy-granting)

General Information:

Name instrument	Parenting Style Inventory II (PSI-II)
Number of items	3
Scales (# items)	Responsivenss (3), demandingness (4), autonomy-granting (4)
Response options	1- totally disagree, 2-disagree, 3-neither agree nor disagree, 4-agree, 5-totally agree

Data collection across the waves:

Relationship direction	Wave 1	Wave 2	Wave 3	Wave 4
Adolescent about parents	X			
Time period specification				
None	X			

Instruction + items:

Indicate whether you agree with the statements below.

1. I can count on my parent(s) (or caregivers) to help me out if I have a problem.
2. My parent(s) (or caregiverss) hardly ever praise me for doing well.
3. My parent(s) (or caregivers) and I do things that are fun together.
4. My parent(s) (or caregivers) expect me to follow family rules.
5. My parent(s) (or caregivers) lets me get away with things.
6. If I don't behave myself, my parent(s) (or caregivers) will punish me.
7. My parent(s) (or caregivers) point out ways I could do better.
8. My parent(s) (or caregivers) respect my privacy.
9. My parent(s) (or caregivers) give me a lot of freedom.
10. My parent(s) (or caregivers) make most of the decisions about what I can do.
11. My parent(s) (or caregivers) believe I have a right to my own point of view.

Scale construction:

Scales	Items	Meaning
Responsiveness	Recode item 2. MEAN(1, 2R, 3).	Higher scores represent higher levels of parental responsiveness.
Demandingness	Recode item 5. MEAN(4, 5R, 6, 7).	Higher scores represent higher levels of parental demandingness.
Autonomy-granting	Recode item 10. MEAN(8, 9, 10R, 11).	Higher scores represent higher levels of autonomy-granting.

Self-control

General Information:

Name instrument	Self-control scale
Number of items	8
Scales	1
Response options	1- totally not true, 2-not true, 3-sometimes true sometimes not true, 4-true, 5-totally true

Data collection across the waves:

Relationship direction	Wave 1	Wave 2	Wave 3	Wave 4
Adolescent about him/herself	X			
Time period specification				
At this moment	X			

Instruction + items:

Indicate how often the statements below happen to you. Tick the answer that applies to you the most at this moment.

1. I have a hard time breaking bad habits
2. I am lazy
3. I have trouble saying no
4. I change my mind fairly often
5. I am good at resisting temptation
6. I am very emotional (e.g. quickly angry, happy or sad)
7. I am easily discouraged
8. I have trouble concentrating
9. I do things that are actually bad for me (e.g. eating to much candy)

Scale construction:

Scales	Items	Meaning
Self-control	RECODE items all items except item 5. MEAN(1R, 2R, 3R, 4R, 5, 6R, 7R, 8R, 9R).	Higher scores represent higher levels of self-control.

Intensity of social media use

General Information:

Name instrument	-
Number of items	5
Scales (# items)	Passive social media use (2), Active social media use (3)
Response options	Items 1 to 3: 1-Never or less than once a day or week; 2-1-2 times a day or week; 3-3-5 times a day or week; 4-6-10 times a day or week; 5-11-20 times a day or week; 6-21-40 times a day or week; 7-more than 40 times a day or week Items 4 and 5: 1-Less than once a day; 2-1-5 times a day; 3-6-10 times a day; 4-11-20 times a day; 5-21-40 times a day; 6-41-80 times a day; 7-more than 80 times a day

Data collection across the waves:

Relationship direction	Wave 1	Wave 2	Wave 3	Wave 4
Adolescent about him/herself	X			
Time period specification				
Past two weeks	X			

Instruction + items:

Think about the past two weeks.

1. How many times a day do you check social network sites (e.g., Instagram, Facebook, YouTube, Pinterest, Discord or Twitter)?
2. How many times a week do you post a message, photo, or video on social network sites (e.g., Instagram, Facebook, YouTube, Pinterest, Discord or Twitter)?
3. How many times a week do you 'like' messages, photos, or videos from others on social network sites (e.g., Instagram, Facebook, YouTube, Pinterest, Discord or Twitter)?
4. How many times a day do you check your smartphone on messages, photo's, or videos, via for example WhatsApp, Snapchat or chat?
5. How many times a day do you send a message, photo or video via your smartphone, via for example Whatsapp, Snapchat, chat?

Scale construction:

Scales	Items	Meaning
Intensity of social media use	SUM(AV17, AV18, AV19, AV21, AV22)	Higher scores represent higher intensity of social media use.
Passive social media use	SUM(AV17, AV21)	Higher scores represent higher intensity of passive social media use.
Active social media use	SUM(AV18, AV19, AV22)	Higher scores represent higher intensity of active social media use.

6.2.Syntaxis

```
DATASET ACTIVATE DataSet2.
DESCRIPTIVES VARIABLES=AV_Age Active_mediation1 Social_media1 Self_control1 Restrictive_mediation1
  /STATISTICS=MEAN STDDEV MIN MAX.

FREQUENCIES VARIABLES=AV3
  /ORDER=ANALYSIS.

T-TEST GROUPS=AV3(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Restrictive_mediation1 Active_mediation1 Social_media1 Self_control1
  /ES DISPLAY(TRUE)
  /CRITERIA=CI(.95).

NONPAR CORR
  /VARIABLES=AV_Age Restrictive_mediation1 Active_mediation1 Social_media1 Self_control1
  /PRINT=KENDALL TWOTAIL NOSIG FULL
  /MISSING=PAIRWISE.

PARTIAL CORR
  /VARIABLES=AV_Age Self_control1 Social_media1 Active_mediation1 BY AV3
  /SIGNIFICANCE=TWOTAIL
  /MISSING=LISTWISE.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Social_media1
  /METHOD=ENTER Restrictive_mediation1 AV_Age AV3
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID)
  /SAVE COOK.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Self_control1
  /METHOD=ENTER Restrictive_mediation1 AV_Age AV3
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID)
  /SAVE COOK.
```

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Self_control1
  /METHOD=ENTER Restrictive_mediation1 AV_Age AV3
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID)
  /SAVE COOK.


REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Social_media1
  /METHOD=ENTER Restrictive_mediation1 AV_Age AV3 Self_control1
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID)
  /SAVE COOK.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Social_media1
  /METHOD=ENTER AV_Age AV3
  /METHOD=ENTER Restrictive_mediation1 Self_control1
  /METHOD=ENTER Active_mediation1
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID)
  /SAVE COOK.
```