

# Out of control? How parents' perceived lack of control over children's smartphone use affects children's self-esteem over time

new media &amp; society

1–21

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DOI: 10.1177/14614448211011452

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## Abstract

As a consequence of children's nearly ubiquitous smartphone use, many parents experience resignation or frustration due to a perceived loss of control over their child's excessive smartphone activities. This perceived lack of control may not only increase children's risk of exposure to online harassment but also affect the relationship between parents and children—both crucial influence factors for children's self-esteem. We tested these relationships using a two-wave panel study of children between 10 and 14 years ( $N_{T_2} = 384$ ) and one of their parents. Findings revealed that parental lack of control over their child's smartphone use increased the risk of children becoming victims of online harassment and decreased children's perceived parental support over time. However, while lower perceived parental control decreased children's self-esteem over time, exposure to online harassment

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did not. We discuss implications of these findings for intervention and prevention of parental lack of control over children's smartphone use.

### **Keywords**

Children, online harassment, parental control, self-esteem, smartphone use

The near-constant use of digital technology among children and adolescents has made parental control increasingly difficult. Around 55% of parents in the United States perceive not to have sufficient control over their child's online conduct (Anderson, 2018). Consequently, many parents express resignation or frustration due to a perceived loss of control over their children's excessive smartphone activities (Erickson et al., 2015).

The consequences of parents' perceived lack of control for children have not yet been investigated, although they deserve particular research attention for several reasons. First, based on the theoretical concept of parental self-efficacy (Coleman and Karraker, 1998; Jones and Prinz, 2005), it can be assumed that parents' perceived lack of control over their child's online behavior may increase children's risk of encountering online harassment. A recent survey shows that exposure to online harassment is highly prevalent, with 59% of US teens reporting experiences with online harassment, such as having false rumors spread about them or being called offensive names (Anderson, 2018). Second, the literature on parental self-efficacy (e.g. Bogenschneider et al., 1997) suggests that parents' perceived lack of control may also directly affect parents' responsiveness to their children's needs, resulting in decreased parental support as reported by the children. Both factors may, in turn, have negative consequences for adolescents' self-esteem, which is particularly vulnerable during the transition from childhood to adolescence (Elsaesser et al., 2017; Erikson, 1968; Tanti et al., 2011).

Against this background, our study contributes to the existing literature in two important ways. First, unlike a wealth of studies that have investigated parental monitoring or mediation behavior in the context of online harassment (e.g. Khurana et al., 2015; Korchmaros et al., 2014; Lee, 2013; Livingstone and Helsper, 2008; Mesch, 2009), we draw from social cognitive theory (Bandura, 1989) and the concept of parental self-efficacy. We explore the consequences of parents' subjective impression of not being able to control children's smartphone use. In doing so, we do not follow studies that merely consider the children's perspective of parental monitoring (e.g. Korchmaros et al., 2014; Palermi et al., 2017; Rodríguez-de-Dios et al., 2018) but systematically combine parents' assessments of perceived lack of control with attitudinal and behavioral outcomes reported by their children, which provides the strongest evidence for a link of parents' control perceptions and child behavior (Jones and Prinz, 2005).

Second, research in this field lacks empirical studies investigating the associations of parental monitoring and children's exposure to online harassment in a longitudinal context (e.g. but see Korchmaros et al., 2014). Although findings from existing cross-sectional studies are no doubt plausible, they remain subject to the well-known limitations of correlational data. For instance, the temporal order of the relationship between parents' lack of control and children's exposure to online risks is unclear (see, e.g. Erickson

et al., 2015, for parental monitoring), as is the directionality of the association between becoming a victim of online harassment and self-esteem (e.g. Palermi et al., 2017; Patchin and Hinduja, 2010). Therefore, testing these relationships in a longitudinal context is of utter importance.

Using data from a two-wave panel study with a quota sample of children between 10 and 14 years and one of their parents ( $N_{T2} = 384$ ) in Germany, we investigated for the first time the association between parental perceived lack of control over children's smartphone use (assessed from the parents' perspective) and children's reported exposure to online harassment, their perceived parental support, and subsequent changes in self-esteem over time. We tested these relationships with an autoregressive longitudinal model.

## **Parental lack of control over children's smartphone use**

Despite the decrease of parental influence and the increase of peer influence in early adolescence, parents still play a critical role in early adolescents' lives (Elsaesser et al., 2017). The literature distinguishes different parenting styles such as authoritarian and authoritative, marked by high parental control, and a permissive style, characterized by parents' tendency to be more indulgent (Baumrind, 1967). Concerning children's media use, scholars have differentiated between specific parental mediation styles such as active mediation, defined by active parent-child discussions about media use, or restrictive mediation, characterized by parents' rule-setting or limitation of children's media use, including technical regulations (Livingstone and Helsper, 2008). The existing research has produced mixed findings about the effectiveness of these parental mediation styles regarding children's exposure to online risks. While some find preventive effects of parental mediation (e.g. Lee, 2013; Rodríguez-de-Dios et al., 2018), others find no or only weak relationships (e.g. Livingstone and Helsper, 2008; Mesch, 2009) or even a positive relationship (e.g. Sasson and Mesch, 2014).

Whether parents might be successful in monitoring or regulating their children's media use may crucially depend on their subjective perception of being capable of controlling their children's media use, which can be described as a facet of parental self-efficacy. Self-efficacy is defined as "people's judgment of their capabilities to organize and execute courses of action required to attain designated types of performance" (Bandura, 1986: 391). Bandura's (1989) social cognitive theory postulates that individuals low in self-efficacy will be less likely to act in ways that will lead to the desired outcome. According to this definition, Jones and Prinz (2005) describe parental self-efficacy as parents' judgment of their capabilities and skills to successfully raise their children. In line with social cognitive theory, they understand parental efficacy as a major factor determining whether parents will successfully persist in a behavior when facing adversity.

The literature on parental self-efficacy distinguishes global and task-related parental self-efficacy (Jones and Prinz, 2005). Extrapolated to the context of children's smartphone use, parental self-efficacy can thus be understood as parents' task-specific confidence in their skills and abilities to control their children's frequency, intensity, and content of smartphone use. Consequently, low parental self-efficacy regarding children's smartphone use is the subjective impression of not having sufficient control, which we

refer to as parents' perceived lack of control over their children's smartphone use. This concept can be distinguished from parental monitoring or parental mediation in that it refers to parents' subjective impression of not having control—irrespective of which monitoring or mediation strategy they employ. Consequently, perceived lack of control may not predict one specific type of parental mediation behavior but rather lead to less effective and inadequate mediation strategies overall (Bogenschneider et al., 1997; Jones and Prinz, 2005). More specifically, subjective perceived lack of control might lead to rigorous mediation behavior and inconsistent mediation behavior (Martins et al., 2019) or even resignation (Erickson et al., 2015) among some parents. Regardless of which exact strategy is employed, it will most likely be less effective if parents have the overall impression that they lack control over their child's smartphone use (see Bogenschneider et al., 1997 for general parental efficacy).

### **Children's exposure to online harassment**

As smartphones allow constant access to social networking sites (SNSs) and other online spaces marked by interpersonal communication, considering the influence of parents' lack of control on children's exposure to online harassment is crucial. In line with the theoretical assumption that self-efficacy results in a higher accomplishment of the desired outcome (Bandura, 1989), parental self-efficacy has been found to predict higher parental competence or psychological functioning (see Jones and Prinz, 2005, for an overview). However, parental self-efficacy is not only associated with parents' behavior but also directly predicts their children's adjustment and behavior (Jones and Prinz, 2005). For instance, parental self-efficacy has been related to fewer behavioral problems or higher socioemotional competence among children (e.g. Bogenschneider et al., 1997). More importantly, Malm et al. (2017) identified parents' self-efficacy as a crucial predictor for children's bullying victimization. The authors concluded that parents' perceived impression of preventing their children from bullying—that is, their self-efficacy—contributed to the reduction of children's actual victimization experiences.

Nowadays, children might not only become victim of traditional bullying but are also at risk of becoming victim of online harassment. According to Ybarra and Mitchell (2004), becoming victim of online harassment can be defined as being the target of “an intentional and overt act of aggression . . . online” (p. 320). Examples are receiving upsetting or embarrassing content or becoming the target of the intentional spread of rumors or unfounded claims (Khurana et al., 2015). Although online harassment and cyberbullying are often used interchangeably, cyberbullying represents a more severe form of harassment that involves repeated acts of harm-doing over time (Smith et al., 2008), whereas online harassment can also refer to one-time incidents.

Thus far, several studies have examined the role of parents in children's exposure to online risks. These findings suggest that lower parental monitoring is associated with more problematic Internet use among adolescents (Bleakley et al., 2016), parents' underestimation of their children's exposure to online risks (Byrne et al., 2014), as well as children's (Korchmaros et al., 2014) and adolescents' (Khurana et al., 2015; Sasson and

Mesch, 2014) risk of becoming victims of online harassment. Yet, these studies either assessed specific parental monitoring techniques or parental control from the children's perspective (e.g. Korchmaros et al., 2014; Martínez et al., 2019; Palermiti et al., 2017 Rodríguez-de-Dios et al., 2018), while studies investigating parents' self-efficacy or perceived lack of control and children's risk of being exposed to online harassment are scarce. One of the few studies investigating lack of perceived parental control within qualitative interviews revealed that perceived lack of control leads to resignation among some parents, leaving their children exposed to dealing with online risks by themselves (Erickson et al., 2015).

Drawing from the concept of parental self-efficacy, parents who perceive a lack of control over their child's smartphone behavior are more likely to employ ineffective strategies in protecting their child from harmful behavior overall (Jones and Prinz, 2005; Malm et al., 2017). If parents sense a loss of control over their children's smartphone use, they might have a lower awareness of the child's potentially harmful online behavior and a lower ability to discourage their children from such behavior (Khurana et al., 2015). Thus, it can be assumed that if parents do not feel in control over their children's frequency, intensity, and content of smartphone use (i.e. perceive a lack of control), they are less likely to adequately and effectively protect their children from online harassment. Accordingly, we hypothesized:

*H1. Parents' perceived lack of control increases children's exposure to online harassment over time.*

## **Parents' lack of control and children's perceived parental support**

Drawing from the theoretical concept of parental self-efficacy, parents' perceived lack of control over their children's smartphone use may not only put their children at a higher risk to experience online harassment but may also create a feeling of lack of support among children. Based on social cognitive theory (Bandura, 1989), parental self-efficacy increases the likelihood of accomplishing the desired parental goals (Coleman and Karraker, 1998). In line with this theoretical assumption, parental self-efficacy is related to more effective parenting practices as perceived from the children's perspective (Bogenschneider et al., 1997). Specifically, previous studies have revealed that parental self-efficacy is linked to higher parental warmth (Izzo et al., 2000), higher responsiveness (Bogenschneider et al., 1997), or stronger parental involvement (see Jones and Prinz, 2005, for an overview).

Overall, these outcomes can be subsumed under the concept of perceived parental support, which refers to parents' supportive responsiveness to the child, such as showing warmth, acceptance, or attention to their child's problems (Huver et al., 2010). Perceiving a lack of parental support may have problematic consequences for children, as secure attachment and emotional closeness are crucial for a healthy transition into a phase of more autonomy during adolescence (Ryan and Lynch, 1989).

Regarding parental control over children's smartphone use, first evidence suggests that adolescents who perceived greater parental monitoring of their media use reported more positive involvement with their parents (Khurana et al., 2015). Yet, studies linking parental self-efficacy with children's perceived parental support are still missing in the area of children's smartphone use. However, based on the extensive literature and empirical evidence for parental self-efficacy as an influencing factor for perceived parental support (see Jones and Prinz, 2005 for an overview), it can be assumed that task-related parental efficacy or, in our case, parental lack of control over children's smartphone use, is also related to child's perceived parental support. As stated above, highly efficacious parents are more likely to achieve the desired outcomes in their parenting behavior (Coleman and Karraker, 1998; Jones and Prinz, 2005). Therefore, those parents who have the impression of being in control of their children's smartphone use are more likely to provide more positive experiences for their children with regard to their smartphone use. More specifically, they are more likely to show warmth, higher responsiveness or understanding for their children's smartphone use-related needs (Bogenschneider et al., 1997; Izzo et al., 2000). As a result, children's overall impression of being supported by their parents increases. However, if parents perceive a lack of control over their children's smartphone use, their children will subsequently perceive reduced parental support due to lower responsiveness and understanding provided by their parents for their needs and experiences around their smartphone use. Accordingly, we assumed:

*H2. Parents' perceived lack of control decreases child's perceived parental support over time.*

## **Children's self-esteem**

The transition from childhood to adolescence marks a period when individuals' self-esteem is particularly vulnerable (Erikson, 1968). Previous research has revealed that children in early adolescence (approx. 12–14 years) are particularly susceptible to cues from the social environment, as they aim at achieving a sense of belonging or affiliation (Tanti et al., 2011). Thus, investigating how negative feedback from peers and parents influences children's self-esteem is crucial. Examining the relationship between becoming victim of online harassment and self-esteem is especially important as these forms of harmful feedback are often publicly available to all members of a SNS or online space (Valkenburg et al., 2006), which may have devastating effects on children's and adolescents' self-esteem (Harter, 1999).

Self-esteem has been among the most utilized variables to investigate the influence of parenting on children and adolescents (Martínez et al., 2019). In the offline context, studies have repeatedly shown that experiences with bullying can have harmful effects on adolescent development by decreasing self-esteem (Egan and Perry, 1998). Regarding exposure to online harassment, thus far, several studies have explored the consequences of online harassment in a longitudinal context. Findings from these studies suggest that victims of cyberbullying report more psychological problems such as depressive symptoms, maladaptive self-referential cognitions, and social anxiety (Gómez-Guadix et al., 2013).

Concerning self-esteem, there is consistent cross-sectional evidence that being exposed to negative feedback on SNSs (e.g. Valkenburg et al., 2006) or becoming victim of cyberbullying (Palermi et al., 2017; Patchin and Hinduja, 2010) are associated with lower self-esteem in adolescence. Yet, the causal direction of this relationship remains disputed. While some scholars assume that experiencing online harassment decreases one's self-esteem (e.g. Palermi et al., 2017; Patchin and Hinduja, 2010), others postulate that lower self-esteem predicts the likelihood to be targeted as victims (e.g. Egan and Perry, 1998). Longitudinal studies that allow inferences about the directionality of this relationship are scarce. However, a large-scale study of 3,127 children in the United States over 1 year revealed that experiences of cybervictimization predicted lower self-esteem over time (Smokowski et al., 2014). Since smartphones allow children constant access to SNSs on which online harassment is most likely to take place (Valkenburg et al., 2006), we assumed:

*H3. Exposure to online harassment decreases children's self-esteem over time.*

Not only exposure to online harassment but also perceived parental support may influence children's self-esteem over time. A significant body of research suggests that parent-child relationship quality (e.g. Bulanda and Majumdar, 2009) are positively related to children's and adolescents' self-esteem. Specifically, concerning perceived parental support, experimental (DeHart et al., 2006), cross-sectional (e.g. Bean et al., 2003), and longitudinal studies (e.g. Boudreault-Bouchard et al., 2013; Roberts and Bengtson, 1993) have repeatedly found that parental support benefits adolescents' self-esteem. For instance, a 4-year-longitudinal study of adolescents between the ages of 14 and 18 revealed that maternal and paternal emotional support reinforced self-esteem over time (Boudreault-Bouchard et al., 2013). Yet, longitudinal studies investigating younger children's perceived parental support and self-esteem are missing. Based on this empirical evidence, we assumed a similar relationship for children and hypothesized:

*H4. Perceived parental support increases children's self-esteem over time.*

We chose to test these hypotheses in the age group of 10- to 14-year-olds, as adolescents at this age have growing autonomy in virtual spaces, which makes them prone to online harassment (Erickson et al., 2015). In addition, this is an age range during which there is often tension between parents and children regarding their online media use (Lee, 2013), making the occurrence of parental lack of control over their child's smartphone use more likely. Finally, this age period marks the transition from childhood to early adolescence, when children are particularly vulnerable to social cues, as peer influences gain increasing importance, while parental involvement is still high (Gómez et al., 2017).

Figure 1 shows all hypotheses.

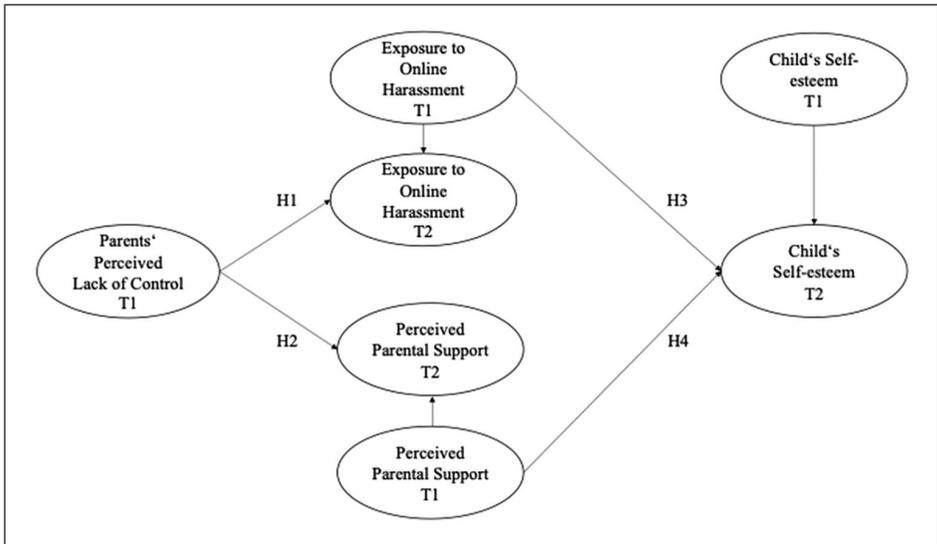


Figure 1. Hypothesized model.

## Method

### Procedure

This study was part of a large longitudinal two-wave panel survey that linked children's data with data from one of their parents (=parent-child dyads) (Matthes et al., 2021). A private polling company collected the survey data, which was embedded in a larger project on parent-child smartphone use at two time points in September/October 2018 and January/February 2019 (i.e. in a 4-month interval) in Germany. We applied a quota-sampling procedure with regard to parents' age and gender. Our reasons for choosing a 4-month interval were twofold. First, a 4-month interval has been found to be a suitable time frame to investigate consequences of digital media use for cyberbullying experiences (Ojeda et al., 2019) and psychological outcomes (e.g. Yao and Zhong, 2014). Second, we accounted for feasibility considerations by the polling company to ensure the highest possible response rate of parent-child dyads in the second wave. We included participants in our study if children were between 10 and 14 years old, possessed a smartphone, and had used a SNS on their smartphone at least once prior to study participation, resulting in 822 parent-child dyads at Time 1 (T1) (parents: 57.2% women,  $M_{age} = 42.94$  years,  $SD_{age} = 7.10$ , 53.5% no high school degree, 20.8% high school degree, 25.7% university degree; children: 51.1% girls,  $M_{age} = 12.09$  years,  $SD_{age} = 1.37$ ), and 384 parent-child dyads at Time 2 (T2) (parents: 53.4% women,  $M_{age} = 43.57$  years,  $SD_{age} = 6.89$ ; 51% no high school degree, 18.5% high school degree, 30.5% university degree; children: 46.6% girls,  $M_{age} = 12.37$  years,  $SD_{age} = 1.48$ ).

The attrition rate was 53% for T2. Parents who dropped out at T2 did not differ from those who participated at both time points with regard to their age,  $F(1,820) = 1.25$ ,

$p = .264$ , partial  $\eta^2 = .00$ , or perceived lack of control,  $F(1,820) = 2.62$ ,  $p = .106$ , partial  $\eta^2 = .00$ . However, female parents were significantly more likely to drop out of the study than male parents,  $\chi^2(1, n = 822) = 4.23$ ,  $p = .040$ , which was not problematic, because more female than male parents participated in the first wave. Children who dropped out at T2 did not differ with regard to their age,  $F(1,820) = 0.64$ ,  $p = .426$ , partial  $\eta^2 = .00$ , perceived parental support at T1,  $F(1,820) = 3.00$ ,  $p = .084$ , partial  $\eta^2 = .00$ , exposure to online harassment at T1,  $F(1,820) = .839$ ,  $p = .360$ , partial  $\eta^2 = .00$ , or self-esteem at T1,  $F(1,820) = 1.96$ ,  $p = .162$ , partial  $\eta^2 = .00$ . However, girls were significantly more likely to drop out at T2 than boys,  $\chi^2(1, n = 822) = 5.79$ ,  $p = .016$ , resulting in a slight underrepresentation of girls at T2. Prior to survey participation, we informed the respondents that the questions would deal with their smartphone and SNS use and ensured anonymity.

## Measures

Table 1 shows zero-order correlations and the descriptives of all variables. Table A.3.-A.6. in the online supplementary material shows confirmatory factor analyses (CFA) for all measures.

*Parental lack of control over their child's smartphone use (parents' perspective).* We used four items similar to Lloyd and Hastings (2009). Two items were based on the subdimension parental efficacy ("Sometimes I feel that I don't have enough control over my child's mobile phone use"; "Sometimes I find it difficult to control my child's mobile phone use") and two items were based on the subscale parental control of child's behavior ("Sometimes when I'm tired, I let my child use the phone, although I wouldn't normally allow it"; "It is often easier to allow my child to use the phone than to endure a tantrum"). High scores on parental efficacy indicate parents' subjective feeling of being effective in their parenting role, while high scores on parental control refer to parents' feeling of being able to control their child's behavior (Lloyd and Hastings, 2009). Respondents indicated their response on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).

*Child's online harassment (child's perspective).* We used three items based on Leung's (2014) Internet harassment subscale. On a 6-point Likert-type scale ranging from 1 (never) to 6 (almost every day), children were asked to indicate how often they had experienced the following situations thus far: "I received bad or insulting comments"; "Someone said wrong things about me"; "Someone made fun of me." At T1, 45% of the children did not report any harassment situation, 12% indicated to have experienced one situation, 15% two situations, and 28% all three situations. At T2, 43% reported no harassment situation, 11% one situation, 15% two situations, and 31% all three situations. Child's perceived parental support (child's perspective). We assessed child's perceived parental support with three items based on Schwarzer and Schulz (2013) on a 4-point Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree) ("When I'm not well, my parents show me that they love me"; "When I'm sad, my parents cheer me up"; "My parents are always there for me when I need comfort").

Table 1. Zero-order correlations.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	M	SD	Cronbach's $\alpha$
Parents' gender <sup>a</sup>	1.00														
Parents' age	.23***	1.00											42.94	7.10	
Child's gender <sup>a</sup>	.02	.00	1.00										12.09	1.37	
Child's age	.01	.18***	-.03	1.00									2.52	1.03	.85
Parents' perceived lack of control (T1)	.03	-.01	.00	.09**	1.00								2.48	1.03	.87
Parents' perceived lack of control (T2)	.08	-.04	.05	.02	.73**	1.00							1.83	1.04	.89
Child's exposure to online harassment (T1)	.10**	-.12**	-.08*	.07*	.33**	.35***	1.00						1.84	1.04	.90
Child's exposure to online harassment (T2)	.13*	-.15**	-.13*	.05	.34**	.34***	.67***	1.00					3.53	0.58	.87
Child's perceived parental support (T1)	-.05	.14***	.00	-.10**	-.28**	-.26***	-.29***	-.22	1.00				3.52	0.57	.85
Child's perceived parental support (T2)	-.08	.18***	-.04	-.14**	-.37***	-.33***	-.32***	-.43***	.52***	1.00			3.79	0.72	.75
Child's self-esteem (T1)	.00	.05	.00	-.06	-.20***	-.17**	-.26***	-.19***	.38***	.32***	1.00		3.79	0.72	.75
Child's self-esteem (T2)	.05	.12*	-.06	-.08	-.36***	-.33***	-.23***	-.24***	.38***	.47***	.46***	1.00	3.79	0.68	.76

SD: standard deviation.  $N_{T1} = 822$ ,  $N_{T2} = 384$ ; T1 = Time 1; T2 = Time 2; <sup>a</sup> Female is reference category.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

*Child's self-esteem (child's perspective).* We measured self-esteem with three items based on the self-worth dimension of the KINDL questionnaire (Ravens-Sieberer and Bullinger, 1998). On a 5-point Likert-type scale ranging from 1 (never) to 5 (always), children were asked to indicate how they felt during the last week ("I was proud of myself"; "I felt good with myself"; "I liked myself").

## Data analysis

The dataset and analysis scripts can be found on the Open Science Framework (OSF) (<https://osf.io/k5bta/>). We analyzed our data using Structural Equation Modeling (SEM) with Full Information Maximum Likelihood estimation in the R-package *lavaan* (Rosseel, 2012). We ran an autoregressive model (Adachi and Willoughby, 2015), that is, we controlled for past levels on the outcome, for example, children's self-esteem at T1, to predict change in levels of children's self-esteem at T2. All relations were tested via the time lag between T1 and T2. We controlled for parents' and children's gender and age by adding them as predictors in all analyses.<sup>1</sup>

To determine the model fit, we used the chi-square to degrees of freedom ratio ( $\chi^2/df$ ), the comparative fit index (CFI), the Tucker–Lewis index (TLI), and the root mean square error of approximation (RMSEA). In general, RMSEA values lower than .05 and a CFI or TLI higher than .95 indicate good model fit (Hu and Bentler, 1999).

## Results

### Confirmatory factor analysis and measurement invariance

A confirmatory factor analysis (CFA) including all measurements revealed an excellent model fit (CFI=.99; TLI=.98,  $\chi^2/df=1.62$ ;  $p < .001$ ; RMSEA=.03, 90% confidence interval (CI) [.02; .03], see Table A.7. in the Online Supplementary Material). To test for longitudinal measurement invariance, we constrained all factor loadings and all intercepts of the same constructs across measurement occasions (i.e. T1 and T2) as equal to establish metric and scalar invariance. The constrained model revealed a good fit: CFI=.99; TLI=.98,  $\chi^2/df=1.55$ ;  $p < .001$ ; RMSEA=.03, 90% CIs [.02; .03]. A nested model comparison showed no significant difference between the unconstrained and the constrained model ( $\Delta\chi^2=5.38$ ,  $df=12$ ,  $p=.944$ ). We also found no significant difference between the latent means of children's exposure to online harassment at T1 and T2 ( $p=.907$ ), perceived parental support at T1 and T2 ( $p=.143$ ), and self-esteem between T1 and T2 ( $p=.332$ ), which confirms metric and scalar invariance of our constructs.

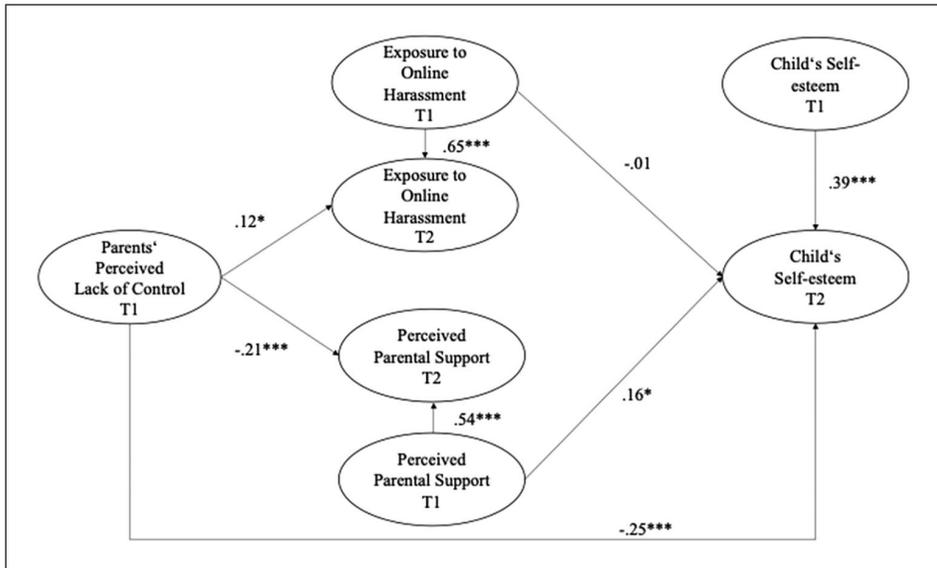
### Structural equation model

Table 2 and Figure 2 show all findings. The hypothesized model revealed a good model fit (CFI=.97; TLI=.97,  $\chi^2/df=1.79$ ;  $p < .001$ ; RMSEA=.03, 90% CIs [.03; .04]). We found that parents' perceived lack of control at T1 positively predicted child's exposure to online harassment at T2,  $b=0.11$ ,  $SE=0.04$ ,  $\beta=.12$ ,  $p=.018$ . Thus, H1 was confirmed.<sup>2</sup> Furthermore, parents' perceived lack of control at T1 had a significant negative influence

**Table 2.** Results of the hypothesized structural equation model based on the full information maximum likelihood procedure controlling for baseline assessments of the outcomes to assess residual changes.

Predictor	Child's exposure to online harassment (T2)			Child's perceived parental support (T2)			Child's self-esteem (T2)					
	b	SE	β	95% CIs	b	SE	β	95% CIs	b	SE	β	95% CIs
Parents' gender (T1) <sup>i</sup>	0.08	0.08	.04	-0.07; 0.23	-0.05	0.05	-.05	-0.14; 0.04	0.12*	0.06	.10	0.00; 0.24
Parents' age (T1)	-0.01	0.01	-.08	-0.02; 0.00	0.01*	0.00	.12	0.00; 0.02	0.01	0.01	.06	-0.00; 0.01
Child's gender (T1) <sup>i</sup>	-0.19*	0.08	-.11	-0.34; -0.04	-0.03	0.05	-.03	-0.12; 0.06	-0.03	0.06	-.03	-0.15; 0.04
Child's age (T1)	0.01	0.03	.01	-0.05; 0.06	-0.03	0.02	-.08	-0.06; 0.00	-0.01	0.02	-.02	-0.05; 0.03
Parents' perceived lack of control (T1)	0.11*	0.04	.12	0.02; 0.19	-0.10***	0.03	-.21	-0.15; -0.05	-0.15***	0.04	-.25	-0.22; -0.07
Child's exposure to online harassment (T1)	0.61***	0.05	.65	0.52; 0.71	0.54***	0.06	.54	0.42; 0.65	0.19*	0.04	-.01	-0.08; 0.07
Child's perceived parental support (T1)									0.38***	0.07	.39	0.02; 0.36
Child's self-esteem (T1)												
R <sup>2</sup>	.51				.43				.39			

<sup>i</sup>p < .05, \*\*\* p < .001.



**Figure 2.** Findings of structural equation model (standardized coefficients). Factor loadings and covariates are omitted from the model due to clarity reasons.

on child's perceived parental support at T2,  $b = -0.10$ ,  $SE = 0.03$ ,  $\beta = -.21$ ,  $p < .001$ . Therefore, we accepted H2.<sup>2</sup> However, we found that exposure to online harassment at T1 was not related to children's self-esteem at T2,  $b = -0.01$ ,  $SE = 0.04$ ,  $\beta = -.01$ ,  $p = .857$ . Therefore, we rejected H3. Moreover, we found a positive relationship of child's perceived parental support at T1 with children's self-esteem at T2,  $b = 0.19$ ,  $SE = 0.09$ ,  $\beta = .16$ ,  $p = .030$ . Therefore, H4 was supported.

Although not hypothesized, we also found a direct negative relationship between parents' perceived lack of control and child's self-esteem at T2,  $b = -0.15$ ,  $SE = 0.04$ ,  $\beta = -.25$ ,  $p < .001$ , which was not explained by child's exposure to online harassment or child's perceived parental support.

Among the covariates, our results showed that girls reported more exposure to online harassment at T2,  $b = -0.19$ ,  $SE = 0.08$ ,  $\beta = -.11$ ,  $p = .011$  than boys, children whose parents were older indicated more perceived parental support at T2,  $b = 0.01$ ,  $SE = 0.00$ ,  $\beta = .12$ ,  $p = .018$ , and children whose participating parent was male indicated more self-esteem at T2,  $b = 0.12$ ,  $SE = 0.06$ ,  $\beta = .10$ ,  $p = .047$ . Overall, all predictors in the model explained 39% of the variance in children's self-esteem (adjusted  $R^2 = .39$ ).

### Additional analyses

We also tested for reversed causality of the hypothesized relationships. Changing the positions of self-esteem and parental support in our SEM revealed a significant relationship of self-esteem at T1 on parental support at T2 controlling for parental support at T1 ( $b = .11$ ,  $SE = .04$ ,  $\beta = .14$ ,  $p = .016$ ; Model Fit: CFI = .97. TLI = .97;  $\chi^2/df = 1.77$ ; RMSEA = .03; 90% CIs [.03; .04]). However, the small difference of the model fit

statistics between the original and the reversed model ( $\Delta\chi^2=3.65$ ) suggests that the hypothesized model fitted the data as good as the reversed model. We found no other reversed relationships between the constructs in our model.<sup>3</sup>

## Discussion

Drawing from the theoretical framework of social cognitive theory (Bandura, 1989) and the concept of parental self-efficacy (e.g. Coleman and Karraker, 1998; Jones and Prinz, 2005), this study sought to investigate how parents' perceived lack of control over children's smartphone use is linked with children's reported exposure to online harassment, their perceived parental support, as well as the resulting consequences for their self-esteem. In line with the existing literature on parental self-efficacy and bullying victimization (Malm et al., 2017), we found that children's exposure to online harassment increases as a function of parents' perceived lack of control over their children's smartphone use. Hence, children whose parents did not feel in control over their child's smartphone activities were more likely to become victim of online harassment. This finding can be explained by less effective strategies in preventing their child from online harm employed by parents who perceive a lack of control or efficacy (Malm et al., 2017; see Bogenschneider et al., 1997, for general parental efficacy).

Although children's experiences with online harassment were higher when their parents perceived a lack of control, we could not confirm the relationship between exposure to online harassment and self-esteem found in cross-sectional studies (Palermi et al., 2017; Patchin and Hinduja, 2010). Contradicting our assumption, we did not find an association of exposure to online harassment over time with self-esteem beyond parental lack of control and children's perceived parental support.<sup>4</sup> The overall low level of online harassment experiences may explain the absence of this relationship. In other words, when the frequency of online harassment is low, the influence of other, more stable, predictors such as perceived parental support might play a more important role for children's self-esteem than occasional exposure to online harassment.

However, the relative influence of online harassment might be different for severe victims of online harassment. It might be the case that negative associations with self-esteem become significant only at a certain threshold of online harassment (see May and Bigelow, 2005).<sup>5</sup> For instance, Palladino et al. (2015) defined severe victims of cyberbullying as those who reported being bullied at least once a week or more often. Only 1% of the children reached this particular threshold in our sample. Thus, it might be possible that this level of severe online harassment represents a critical threshold for changes in self-esteem over time but that not enough children reached this threshold in our sample (May and Bigelow, 2005). However, with regard to self-esteem as an outcome, such a threshold effect has not yet been demonstrated and should be the subject of future research.

Alternatively, it is also possible that negative relationships with self-esteem due to online harassment did not emerge in the 4-month period of our study but only when cumulated over a longer time span (e.g. 3 years, Evans et al., 2014). Conversely, the period of 4 months might have been too long to observe short-term changes in

self-esteem due to occasional online harassment. Even a low dose of online harassment might affect self-esteem when measured at the same time point, but it may not have a lasting effect on self-esteem. Future research should therefore combine short-term and long-term measurements, for instance, in measurement burst designs, to assess these potential dynamic changes.

With regard to perceived parental support, we found that parents' perceived lack of control negatively impacted children's impression of being supported by their parents, which was negatively related to children's self-esteem over time. This finding supports the existing empirical evidence on parental self-efficacy (e.g. Bogenschneider et al., 1997; Izzo et al., 2000; see Jones and Prinz, 2005, for an overview), which revealed that higher efficacious parents show more parental warmth and responsiveness to their children's needs. Hence, it is conceivable that parents who perceive a lack of control over their children's smartphone use are less responsive to their children's needs and provide lower understanding for their children's smartphone use, which is reflected in lower perceived parental support reported by the children. In our study, we linked the task-specific perceived lack of control among parents for the first time with lower perceived support among children, which is an important theoretical contribution.

In line with the existing literature (Boudreault-Bouchard et al., 2013; Roberts and Bengtson, 1993), lower perceived parental support, in turn, was related with lower levels of children's self-esteem over time. It is also important to note that there was a reciprocal relationship between children's perceived parental support and their self-esteem, suggesting a vicious circle of not feeling supported and feeling bad about oneself.

Furthermore, we also found a direct relation of parental lack of control over their child's smartphone use with children's self-esteem not explained by exposure to online harassment or perceived parental support. This finding is in line with the literature showing that parental self-efficacy might either influence child's adjustment directly or indirectly via parenting (Jones and Prinz, 2005). Nevertheless, future research should investigate other potential underlying mechanisms.

Importantly, the influence of parents' lack of control on children's exposure to online harassment was independent of important control variables (see online supplementary material), such as the child's offline popularity or unmonitored smartphone use (Chen et al., 2017) but also parental characteristics such as socio-demographic variables like family size or relationship status. Moreover, girls were more likely to become the target of online harassment, which confirms previous findings (Anderson, 2018). Therefore, follow-up studies should consider gender differences.

Taken together, in line with previous research (Khurana et al., 2015), our findings shed light on the importance of parents feeling in control over their children's smartphone activities. In doing so, we combined parents' subjective control perceptions with children's reports of their feelings and behavior rather than relying on parents' reflections of their child's behavior, which makes a crucial theoretical contribution to the literature. Linking parents' and children's perceptions is a major strength of this study, as it provides the strongest evidence for how parental perceptions are linked with child behaviors (Jones and Prinz, 2005).

### *Limitations*

Some limitations of our research need to be noted. First, the size of the relationship between parents' perceived lack of control and children's exposure to online harassment was relatively small, which suggests that the influence of parents' lack of control on children's exposure to online harassment is of less importance compared with other predictors of online harassment victimization such as traditional bullying victimization (e.g. Sasson and Mesch, 2014) or risky Internet use (see Chen et al., 2017 for an overview). However, the inclusion of the autoregressive effects reduces the effect sizes of the predictor on the outcome in longitudinal models. In such models, even small effects might be meaningful when predicting change (Adachi and Willoughby, 2015). Moreover, it is important to note that our results remained robust despite the inclusion of child's offline popularity, which can be an indicator for potential offline bullying. Second, although testing relationships between two time points is a robust technique and commonly used in two-wave panel studies (Reinecke and Trepte, 2014), future research should employ three or more waves to account for complex dynamics over time and to account for within- and between-person effects (see, e.g. Jensen et al., 2019). Third, we did not assess children's smartphone usage types. As exposure to online harassment has been found to vary with different usage types of digital media (Cho and Yoo, 2017), future studies should take specific activities and content into account. Finally, parents' and children's data were based on self-reports, which might suffer from memory biases (see Schnauber-Stockmann & Karnowski, 2020). However, we used several procedures to encourage honest and accurate answers in this study.

### *Implications*

These limitations notwithstanding, this study has some important theoretical and practical implications. On the theoretical level, our concept of parents' perceived lack of control can be embedded in the theoretical approach of parental efficacy, as it can be considered a type of task-related parental efficacy (Jones and Prinz, 2005). Such a task-specific conceptualization of parental efficacy might provide a more nuanced understanding of the complex interplay between parental mediation and children's smartphone usage than the assessment of parental efficacy in general. More specifically, theoretical models aimed at explaining the predictors and consequences of children's smartphone use should account for both parents' subjective feelings of control and the actual behavioral measures they employ to control their children's smartphone usage behavior. Such a comprehensive theoretical approach may help explain, for instance, previous contradicting findings regarding the protective role of parental mediation on children's exposure to online harassment (e.g. Lee, 2013; Rodríguez-de-Dios et al., 2018; Sasson and Mesch, 2014).

On the practical level, interventions aimed at strengthening their subjective impression of perceived control need to be employed to tackle parents' perceived lack of control over their children's smartphone use. For example, in the general area of parental self-efficacy, training the parents successfully improved parent-child communication (see Jones and Prinz, 2005, for an overview). Thus, there is a need for offering more easily accessible intervention programs that, for example, help parents gain knowledge of how

to monitor and regulate children's smartphone use and how to engage in Internet safety procedures, which can strengthen their subjectively perceived control in the long term. For children, intervention programs that help them gain (a) digital literacy skills (Rodríguez-de-Dios et al., 2018) and (b) interpersonal skills specific for online contexts should be designed and implemented in schools.

### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was funded by the Sparkling Science Programme of the Austrian Federal Ministry of Education, Science and Research (SPA 06/ 109).

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### Supplemental material

Supplemental material for this article is available online.

### Notes

1. We also ran a model controlling for additional parental socio-demographic characteristics and children's smartphone use with or without their parents being present (see Table A.2. in the online supplementary material). This model's results are essentially the same in their significance and directionality as the ones presented here.
2. To rule out alternative explanations for the relationship of parents' perceived lack of control and children's exposure to online harassment, we ran a model controlling for children's perceived popularity at T1 as an indicator for potential offline bullying (see Table A.1. in the online supplementary material) as well as children's smartphone use without their parents' presence. The results of this model remain essentially the same in their significance and directionality as the ones presented here.
3. To test whether parents' perceived lack of control exerts an indirect effect on child's self-esteem via exposure to online harassment or via child's perceived parental support, we also ran an alternative model testing exposure to online harassment and perceived parental support at T2 as mediators to predict self-esteem at T2, which confirmed the results of our autoregressive panel model (see online supplementary material).
4. When perceived parental support and parents' perceived lack of control are not controlled in the analysis, a negative relationship between exposure to online harassment at T1 and self-esteem at T2 controlling for self-esteem at T1 is visible ( $b = -.10$ ,  $SE = .03$ ,  $p = .001$ ).
5. We did not find support for a non-linear association (i.e. quadratic, cubic, s-shaped, or exponential) between exposure to online harassment and self-esteem. We also tested whether the number of online harassment events experienced at T1 (i.e. ranging from 0 = "no online

harassment event experienced” to 3 = “all three online harassment events experienced at least once”) influenced self-esteem at T2, which was not the case ( $b = -.01$ ,  $SE = .03$ ,  $p = .841$ , see A.8. in the online supplementary material).

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