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Parenting Strategies and Adolescents' Cyberbullying Behaviors: Evidence from a Preregistered
Study of Parent-Child Dyads

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Author's Note

Data can be accessed here:

https://osf.io/2hm7q/?view_only=00cbf594f894462db285d6a79d667afb

Preregistration and materials can be accessed here:

https://osf.io/mdsh9/?view_only=a0a0f1eed4f74e81bf7b07f9ff02ff0f

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Abstract

Little is known about how parents may protect against cyberbullying, a growing problem-behavior among youth. Guided by self-determination theory, a theory concerned with effectively motivating and regulating behavior, six preregistered hypotheses concerning parenting strategies of regulating cyberbullying behavior were tested in 1,004 parent-child dyads (45.9% female adolescents; adolescents were either 14 (49.5%) or 15 (50.5%) years old). The results largely supported hypotheses: Parents who used more autonomy-supportive strategies – understanding the adolescent’s perspective, offering choice, and giving rationales for prohibitions – had adolescents who reported engaging in less cyberbullying than parents who used controlling strategies (especially using guilt, shame, and conditional regard). Further, this was mediated by lower feelings of reactance to, or a desire to do the opposite of, parents’ requests. The discussion focuses on the limits of this study to investigate reciprocal effects of adolescent behavior shaping parenting strategies – a critical agenda for future research – as well as the potential benefits of interventions aimed at increasing parental autonomy support for reducing cyberbullying and other problem behaviors in adolescents.

Keywords: *cyberbullying, bullying, parenting, autonomy support, reactance*

Introduction

Cyberbullying, defined as repeated, intentional aggression towards a victim who cannot easily defend herself or himself, and that occurs via electronic contact (e.g., social media, online games, text messages; Wolke, Lereya, & Tippet, 2016), represents a significant problem for youth (Kowalski, Giumetti, Schroder, Lattanner, 2014). It is regarded as a newer, and often co-occurring, expression of traditional bullying (Li, 2007). Building on work showing adverse effects of being either a victim or perpetrator of bullying, including increased risk of depression, anxiety, and suicidal behaviors well into adulthood (Copeland, Wolke, Angold, & Costello, 2013), recent research similarly demonstrates adverse outcomes for victims and perpetrators of cyberbullying (Przybylski & Bowes, 2017). Given the costs of cyberbullying to the victim and perpetrator, it is worthwhile to understand how and why this problem behavior develops, yet relatively few studies examine these questions. This is unfortunate, because understanding why adolescents engage in cyberbullying and how to best respond to these behaviors would help parents to more effectively regulate these online social behaviors. Moreover, identifying parenting strategies linked to lower levels of this problem behavior may be particularly important in providing clues on the most effective routes of more formalized intervention (Silva, Marques, & Teixeira, 2014), for example, in educational or therapeutic settings.

To address this gap, this work employed a self-determination theory framework (Ryan & Deci, 2017) to investigate family dynamics that might influence an adolescent's engagement in cyberbullying. Self-determination theory is a theory of motivation and well-being, and outlines how parents and other socializers can regulate behavior and promote optimal development. As parents play the most central role in the social and emotional development of their children (Pomerantz, Ng, Wang, 2008), a core tenant of self-determination theory is that *autonomy*

support is a key quality of parenting that promotes healthy social and emotional development in youth (Grolnick, 2009). When parents provide autonomy support, they support their child's need to behave authentically and in accordance with her or his own values and beliefs. Importantly, though autonomy-supportive parenting involves encouraging one's child to make meaningful choices, autonomy support is not synonymous with permissiveness, or allowing children complete freedom. Rather, autonomy-supportive parents set limits and prohibit inappropriate behaviors, but critically, they provide a meaningful rationale in order for the youth to "buy-in" to the desired change. As a result, the child experiences more choice around behaving appropriately. For this reason, autonomy-supportive parenting was expected to be a protective factor of cyberbullying behavior in adolescents. This is in contrast to *controlling* parenting that relies on strategies like guilt, shame, and threats of punishment to pressure a child to behave in desired ways. Because the child has little to no "buy-in" with controlling strategies of regulating behavior, we expected these may be a risk factor for cyberbullying. Further, this research aimed to investigate *why* these parenting strategies would predict cyberbullying, expecting it to be explained by feelings of reactivity, or a desire to do the opposite of what is asked, in response to a parent's attempts to prohibit behavior.

Parenting Factors in Traditional Bullying and Cyberbullying

Evidence suggests that parents are among the most important influences that shape the development and maintenance of bullying behaviors (along with educators, Ahmed & Braithwaite, 2004, and peers, Festl, Scharnow, & Quandt, 2013). Yet few studies have actually examined family risk and protective factors of traditional bullying or cyberbullying. Those that do point to factors such as domestic violence (Baldry, 2003), parental maltreatment (Shields & Cicchetti, 2001), and neglect (Lereya, Samara, & Wolke, 2013) as risk factors for bullying.

Closer to the concept of parental control autonomy support, Baldry and Farrington (2005) found that children's perceptions of punitive parenting (being strict and quick to punish) related to more engagement in bullying, whereas an authoritative parenting style, characterized by supportive but firm guidance, predicted less engagement. Similar parenting correlates have been identified as risk factors for cyberbullying (Dehue, Bolman, Vollink, & Pouwelse, 2012), along with others such as limited parental monitoring and involvement (Wang, Iannotti, & Nansel, 2009), and a weak emotional connection with parents (Ybarra & Mitchell, 2004).

The findings from past studies suggest that parenting styles play an important role in cyberbullying, but there are outstanding unknowns in this literature. First, these studies evaluated children's and adolescents' perspectives of parental styles, a problematic method considering that more troubled youth may feel more alienated from parents and perceive them as more punitive and less supportive, regardless of how parents actually behave. Second, studies tend to focus on the parent-child relationship more broadly, but parents can vary in terms of their parenting styles across different domains (for example, providing autonomy support in motivating their child's sporting activities, but little of it when motivating schoolwork). Thus, defining the impacts of a parent's general style for regulating their children's behaviors is only partially informative for understanding how they respond to specific problem social behaviors their children engage in, such as cyberbullying. Finally, the existing evidence base is comprised of studies that expanded the theoretical scope of the phenomenon but did not explicitly test this theory using a pre-registered design (see Munafò et al., 2017). Given the promising findings from exploratory work suggesting parenting might play an important role in adolescent's cyberbullying behaviors, it is essential to apply a confirmatory theory-testing approach to determine how robust these effects might be.

Parental Autonomy Support and Prohibiting Behavior

Self-determination theory posits that certain strategies of motivating behavior, in parenting and other influential relationships, are more or less effective in eliciting behavioral change (Ryan & Deci, 2000). Specifically, parenting styles vary in how much they elicit desirable behaviors in a way that is supportive of the child's autonomy, even when communicating limits around, or prohibiting, problematic behaviors. Autonomy-supportive parenting consists of characteristics that are conducive to motivating or regulating behavior, namely: a) seeking their child's perspectives on her or his behaviors and experiences, b) providing meaningful rationales or explanations when setting limits and prohibitions that help youth understand the reasons these are implemented, and c) providing unconditional positive regard for their child even when behavior does not match parents' expectations or desires (Assor, Roth, & Deci, 2004). In contrast, controlling parenting strategies to regulate behavior involve issuing threats of punishment if behavior does not change, attempting to make children feel guilty or ashamed, and using regard or affection conditional on certain actions to shape behavior in desired ways (Soenens & Vansteenkiste, 2010).

Perhaps not surprisingly, autonomy-supportive more than controlling parenting strategies for regulating behavior in youth shapes their engagement in adaptive versus maladaptive behaviors (Ryan & Deci, 2017). For example, autonomy-supportive parents have children who tend to better internalize – take in, or embrace – their rules and values, and as a result engage in more prosocial behaviors (Gagne, 2003). Conversely, controlling parenting predicts lower internalization of parents' rules and values, and has been linked to more aggressive and antisocial behavior in kids (Joussemet et al. 2008). Given autonomy support encourages youth to internalize the value of positive social behaviors, it is likely more successful than control in

terms of achieving these desired behaviors. In support of this, one study found that autonomy-supportive parents who prohibited their child from affiliating with a deviant peer were more successful in achieving this aim as compared to controlling parents (Soenens, Vansteenkiste, & Niemiec, 2009). Similar effects were anticipated around the issue of cyberbullying – that is, parents who are autonomy supportive around problematic social behaviors like cyberbullying will have children who engage in less of it.

The Role of Reactance

It was anticipated that, in response to controlling parents, adolescents may act out by engaging in that prohibited behavior more because a controlling approach to regulating behavior elicits feelings of reactance. This expectation is based on results from recent studies suggesting controlling messages from parents and others can backfire, and actually *increase* the behavior they are trying to reduce (e.g, messages to reduce prejudice, Legault, Gutsell, & Inzlicht, 2011; messages to limit screen use, Bjelland et al., 2015). Presumably, controlling parenting elicits the opposite of the behaviors parents desire because youngsters respond with more reactance when they feel controlled as compared to when they experience autonomy support from parents and other authority figures (Ryan & Deci, 2017). Closely related to the present study, Vansteenkiste, Soenens, Van Petegem, and Duriez (2014) examined the way parents communicated prohibitions of immoral behaviors (e.g., lying, stealing) to their children, and identified that autonomy-supportive messages that these immoral behaviors were not permissible reduced reactive feelings in adolescents as compared to more controlling forms of the same messages. Extending on this work, this research aimed to look not only at how autonomy-supportive versus controlling parenting strategies of prohibiting behaviors would predict reactive feelings in adolescents, but to understand whether they, in turn, predict how much adolescents are actually engaging in that

prohibited behavior. The use of dyadic data was optimal for achieving this because it allowed us to disentangle parenting behaviors and adolescent feelings, reducing the likelihood of effects resulting from a third factor (e.g., adolescents who cyberbully project control onto parents and feel reactance) or which are better explained by an alternative causal pathway (e.g., reactive adolescents project control onto parents).

Current Study

The current study examines the extent to which parents' anticipated reactions to incidents of cyberbullying relate to an adolescent's actual tendency to engage in online aggression. Based on work in self-determination theory, it was expected that when parents use autonomy-supportive strategies to regulate problematic social behaviors like cyberbullying, their adolescents will be less likely to react, or rebel against parents' attempts to regulate their behavior, and in turn will be less likely to engage in cyberbullying. Online bullying is a fascinating form of deviant behavior, in part, because it is a strategy to gain power and dominance over others (Volk, Camilleri, Dane, & Marini, 2012), and should therefore be particularly sensitive to adolescents feeling controlled by parents who may leave them feeling disempowered, whereas adolescents who feel supported in their autonomy by their parents should be less tempted to engage in this form of aggression.

To examine the links between parenting styles for regulating cyberbullying (parent reports), reactance (adolescent reports), and cyberbullying (adolescent reports), we preregistered the study's data collection and analysis plan along with six hypotheses (https://osf.io/mdsh9/?view_only=a0a0f1eed4f74e81bf7b07f9ff02ff0f). As prior work shows that autonomy-supportive strategies are consistently effective in regulating behavior, we expected that parents who use autonomy-supportive strategies to regulate cyberbullying behavior would

have adolescents who report lower cyberbullying behaviors (Hypothesis 1). In contrast, because controlling strategies tend to backfire and increase undesired behaviors, we expected that parents who use controlling strategies to regulate cyberbullying behavior would have adolescents who report greater cyberbullying behaviors (Hypothesis 2). We expected to see this same pattern with adolescent feelings of reactance: autonomy-supportive parenting strategies would relate to lower adolescent reactance (Hypothesis 3), whereas controlling parenting strategies would relate to greater adolescent reactance (Hypothesis 4). Finally, we expected that reactance would explain why autonomy-supportive strategies related to lower engagement in cyberbullying (Hypotheses 5) as well as why controlling strategies related to greater engagement in cyberbullying (Hypotheses 6).

Methods

Participants and Procedure

Participants were 1,004 British adolescents and their parents. The sample of adolescents was roughly divided evenly between 14 (49.5%) and 15 year-olds (50.5%), and males (53.8%) and females (45.9%), with 0.3% reporting neither male nor female. Most (88%) of the sample was White British, reflecting the British population's average of 87% (Gov.uk, 2018), and reported a household income below £55,000 (61%), also reflecting UK norms (Office for National Statistics, 2018). Mothers were the primary respondents in the parent-child dyads (58%); Fathers represented 39% of the parent sample, and other guardians or main caregivers represented 3% of the sample.

This nationally representative sample of adolescents and their parents living in England, Scotland, and Wales was recruited with ICM Research using geographic data, household socioeconomic class, participant age, and gender factors based on 2011 United Kingdom Census

data. This study used a quota sampling approach undertaken by the polling company using the demographic factors noted above. An invitation email containing the link to the survey was mailed out to a batch of panel sample, targeting by relevant variables. The online panel had been recruited through various methods, including at random via telephone, via random online sampling, and through active recruitment and engagement programs. These data were collected as part of a larger study conducted to survey the lives of British youth online in March 2018. Parents completed surveys first, and were asked to leave the room once they were finished so that the adolescent could complete survey responses without their presence. Parent measures lasted approximately ten minutes, and included an assessment of their reactions to their child engaging in hypothetical cyberbullying behaviors. Adolescent measures lasted approximately 15 minutes, and included measures of their cyberbullying behavior, along with reactive feelings in response to their parent's attempts at regulating their behavior. Surveys also assessed variables not included in this report. The preregistration and assessments can be found here https://osf.io/mdsh9/?view_only=a0a0f1eed4f74e81bf7b07f9ff02ff0f, and the data and code can be accessed here: https://osf.io/2hm7q/?view_only=00cbf594f894462db285d6a79d667afb. The study was approved by a Central University Research Ethics Committee, and informed consent was obtained for both parents and adolescents.

Measures

Adolescent cyberbullying. Adolescents rated eight items from the Cyberbullying Scale (Stewart, Drescher, Maack, Ebesutani, & Young, 2014) to self-report the extent to which they engaged in cyberbullying. Adolescents responded according to how they have acted in the past six months using a scale ranging from 1 (*this hasn't happened in the past six months*) to 6 (*several times a week*). They were also presented with the option *don't know/prefer not to say*

(across the eight items 5.7%-7.2% selected this response and were excluded from analyses).

Example items include, “How often have you tried to keep others from liking someone by texting or posting mean things about them?” and “How often have you shared someone’s personal secrets or images online without their permission?” The items were internally consistent ($\alpha = .95$), suggesting that adolescents who engaged in one form of cyberbullying tended to engage in other forms as well, though the average amount of cyberbullying reported was low ($M = 1.46, SD = .73$).

Adolescent reactance. Five items measured adolescents’ feelings of reactance to the target parent (the parent who responded in the first half of the survey) regulating their social behavior. These items were developed by Vansteenkiste and colleagues (2014) for use with adolescents responding to parents’ limit setting. Similarly here, items began with the stem “when my [target parent] wants me to act in a certain way (e.g., being nice to others on social media), these conversations...”, and some example items include “make me think that I want to do exactly the opposite” and “feel like an intrusion.” Items were rated on a scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*), and showed good internal consistency ($\alpha = .92$).

Autonomy-supportive and controlling parenting strategies. Parents and caregivers responded to a modified version of the General Causality Orientations Scale (GCOS; Deci & Ryan, 1985) to assess their tendencies to use autonomy-supportive versus controlling strategies to regulate their adolescent’s behaviors. Parents were asked to imagine how they would respond to their child engaging in different cyberbullying behaviors taken from the Cyberbullying Scale (Stewart et al., 2014; see description above). Parenting strategies were assessed using hypothetical scenarios in order to reduce the alternative causal explanation, that adolescent behaviors (i.e., engagement in cyberbullying) are driving the parent’s responses. In other words, scenarios could

be relevant to all parents as they were presented as hypotheticals, not just to those who have dealt with a child who has cyberbullied.

Thus, parents saw eight hypothetical cyberbullying scenarios (e.g., *You just found out your child has been purposefully leaving out a schoolmate in an online group; You noticed that your child put down a schoolmate on social media; You discovered your child spread a rumour about a female schoolmate being promiscuous on social media*), and for each they were asked how likely they would use controlling (e.g., *I would shame my child for his or her behaviour; I would threaten to punish my child, for example, by taking away his or her computer; I would express less warmth toward my child for awhile to show that I am displeased*) and autonomy-supportive (e.g., *I would try to understand the way my child feels about the situation; I would give my child a clear set of reasons why he or she shouldn't behave that way; I would show my child I love him/her even if I don't approve of this behaviour*) strategies. Thus, sixteen items in total were rated on a scale ranging from 1 (*very unlikely*) to 6 (*very likely*). Items were averaged to create two separate scores for parents, with higher scores reflecting greater autonomy-supportive and controlling strategies of regulating cyberbullying, respectively. Both scores showed good internal consistency (autonomy support, $\alpha = .86$ and control, $\alpha = .81$).

Parental concerns about cyberbullying. Finally, one item asked parents “*How concerned are you that your child is currently engaging in cyberbullying?*” paired with a scale of 1 (*not at all concerned*) to 5 (*extremely concerned*). This item was included as a control variable in exploratory models to help reduce the potentially confounding factor of adolescent’s engagement in cyberbullying leading to more control and less autonomy support from parents (parent concern served as an assessment of parents’ awareness of their child engaging in cyberbullying). On

average, parents reported very little concern that their child was engaged in cyberbullying, though level of concern varied considerably across parents ($M = 1.10$, $SD = 1.49$).

Results

Preregistered Analyses

Six hypotheses were tested in line with the preregistered analysis plan. There was one substantive deviation from the original plan: Results of a concurrent experimental study are not reported because the manipulation check failed, indicating the manipulation did not successfully induce the key construct of interest to the investigation. The full results, including this null result, are available on the study page

(https://osf.io/q7nua/?view_only=00cbf594f894462db285d6a79d667afb). In line with the analysis plan, adolescent cyberbullying behaviors and reactance were regressed onto parenting strategies (autonomy-supportive and controlling strategies were modeled separately). Table 1 presents the means, standard deviations, and zero-order correlations for the key variables of interest, and Table 2 does so for the model coefficients with their standard errors and confidence intervals associated with the hypothesis testing.

First, the predictions that parents' autonomy-supportive strategies of regulating cyberbullying would be associated with both lower engagement in cyberbullying (H1) and less reactance (H3) in adolescents were tested. Results provided support for both hypotheses: Autonomy-supportive strategies predicted less cyberbullying ($\beta = -.30$, $p < .001$) and less reactance ($\beta = -.18$, $p < .001$) in adolescents. Next, main effects of controlling parenting strategies were examined, with the expectation that they would show the inverse pattern of relating to more engagement in cyberbullying (H2) and greater reactance (H4) in adolescents. Surprisingly, a small yet statistically significant effect in the *opposite* direction of what we

predicted in Hypothesis 2 was found: controlling parenting strategies predicted lower engagement in cyberbullying among adolescents ($\beta = -.09, p = .007$). Further, findings failed to support Hypothesis 4: there was no link between controlling parenting strategies and adolescent reactance ($\beta = .04, p = .24$). Taken together, results indicated that both types of parenting strategies related to less engagement in cyberbullying, while only autonomy-supportive strategies predicted lower reactance in adolescents.

Next, Hypotheses 5 and 6 were tested. These focused on the indirect effects of parenting strategies predicting cyberbullying in adolescents through feelings of reactance. The Process macro (Hayes, 2013) was used to compute bootstrapped estimates with 95% confidence intervals (CI) and 5,000 iterations. Results testing Hypothesis 5 showed that reactance mediated the link between autonomy-supportive parenting strategies and adolescent reports of engaging in cyberbullying ($b = -.08, SE = .01, p < .001, 95\% CI [-.10, -.05]$). However, controlling parenting strategies did not indirectly link to adolescent cyberbullying through reactance ($b = .02, SE = .01, 95\% CI [-.01, .04]$). Together, results provided partial support for hypotheses, but only concerning autonomy support: Autonomy-supportive parenting strategies predicted less cyberbullying in adolescents because of lower feelings of reactance. However, results contradicted hypotheses regarding controlling parenting strategies, finding that they likewise predicted less cyberbullying along with autonomy supportive strategies (though unlike with autonomy support, reactance did not play a mediating role).¹

¹ In an exploratory manner, it was tested whether results of the preregistered analyses would hold when controlling for parents' reported concern about their adolescent's cyberbullying. This was done to explore the alternative hypothesis that parents who were aware of or concerned about their child engaging in cyberbullying *became* more controlling and less autonomy-supportive in their parenting style. Indeed, parent concern was a strong predictor of adolescents' reports of their own cyberbullying behavior ($r = .46$), and to a lesser extent, it predicted less autonomy support from parents, $r = -.17$). Though parent concern significantly predicted both cyberbullying behavior and reactivity in adolescents, effects for autonomy-supportive and controlling parenting strategies remained the same in terms of their strength and direction in all models.

Exploratory Analyses

The surprising finding concerning controlling parenting strategies showing similar effects to autonomy-supportive ones, such that both predicted less cyberbullying engagement in adolescents, was intriguing. Indeed, correlations showed that the relations between autonomy-supportive and controlling parenting strategies were positively collinear ($r = .43$). Thus, although theory might anticipate that parents who are autonomy supportive would report using less control, this finding suggested that certain elements were shared between the two types of parenting strategies. To understand where variability was shared between the two theoretically distinct parenting styles, all parenting strategy items were submitted to a factor analysis. While two factors with eigenvalues greater than one emerged, item loadings suggested a pattern that differed from the theorized distinction between autonomy-support and control (Ryan & Deci, 2017). Specifically, only three of the control items clearly loaded onto a factor separate from autonomy support items (i.e., *I would make my child feel guilty for his or her behavior; I would express less warmth toward my child for awhile to show that I am displeased; I would shame my child for his or her behavior*). The remaining control items loaded onto the autonomy-supportive strategies factor, with most of these items assessing punishment (i.e., *I would punish my child to make sure he or she does not act that way again; I would enforce strict restrictions on my child's computer use; I would threaten to punish my child, for example, by taking away his or her computer*).

To investigate these elements of control in a more nuanced way, two new composites were formed: one based on the three control items concerning guilt, shame, and conditional regard that loaded onto a separate factor from autonomy support items ($\alpha = .70$), as well as the three punishment items, all of which loaded onto the autonomy support factor with loadings

above .60 ($\alpha = .81$). Correlating the two new unidimensional controlling parenting dimensions with autonomy support showed that shame/guilt was a more distinct construct to an autonomy-supportive style of regulating cyberbullying ($r = .10$), whereas punishment showed substantial overlap with the autonomy-supportive style ($r = .45$).

Having identified two distinct dimensions of a controlling parenting style, the same analyses described above were conducted with the new composites in order to understand how these different forms of control would operate. The controlling parenting strategies of using shame, guilt, and conditional regard predicted more engagement in cyberbullying among adolescents ($\beta = .12, p < .001$), and more adolescent reactance to parents ($\beta = .18, p < .001$), showing effects in line with the typical negative outcomes associated with controlling parenting. In contrast, punishment related to *less* cyberbullying behavior ($\beta = -.16, p < .001$), though it did not relate to reactance ($\beta = -.04, p = .20$). Finally, in a Process model mirroring the model testing Hypothesis 6 above, results showed that a tendency to be reactive to parents helped explain why controlling strategies of shame, guilt, and conditional regard predicted greater cyberbullying behavior in adolescents ($b = .05, SE = .01, p < .001, 95\% CI [.03, .07]$), though this indirect effect was not apparent for punishment ($b = .01, SE = .01, p = .21, 95\% CI [-.03, .01]$).²

Sensitivity/Alternate Model Analyses

To ensure findings were robust, and not based on our particular analytic choices, we reran models in two different ways: 1) using a log-transformed version of the adolescent cyberbullying variable as scores were not normally distributed (skewness = 2.13, $SE = .08$; kurtosis = 3.90, SE

² Following the logic described in Footnote 1, exploratory analyses further controlled for parental concern about their adolescent's cyberbullying (as concern predicted more parental use of shame/guilt, $r = .11$ and surprisingly, less use of punishment, $r = -.09$). Models showed that this control did not change the strength or direction of effect.

= .16), and 2) including autonomy-supportive and controlling parenting strategies as simultaneous predictors. When using the log-transformed cyberbullying variable, all effects remained the same in terms of their significance and direction, however one effect increased in its effect size (R^2 for autonomy support went from .09 to .11 when using the log transformed cyberbullying variable). In models that entered autonomy-supportive and controlling parenting strategies simultaneously, autonomy-supportive strategies continued to predict less reactance and less cyberbullying, with no change in effect size. However, results changed for controlling strategies: after accounting for the effects of autonomy support, control did not relate to cyberbullying ($p = .19$), and it predicted *more* reactance ($\beta = .14, p < .001$). However, when entering autonomy-supportive strategies alongside the two control dimensions of guilt/shame and punishment in a single model, all effects were the same as those reported earlier (when each parenting strategy was modeled as the only predictor). Taken together, results provide further evidence that autonomy-supportive parenting strategies robustly predict lower reactance and less engagement in cyberbullying, whereas controlling strategies are less robust, and yield different results depending on statistical choices.

Discussion

Cyberbullying represents a growing problem behavior among youth, and a small body of research has focused on identifying parenting factors that predict engagement in this harmful behavior (e.g., neglect, Dehue et al., 2012; low parental monitoring and poor relationship quality, Ybarra & Mitchell, 2004). While informative, these prior studies tend to rely on youth reporting on their parents' behaviors, a problematic method considering that a youth's own bullying behavior (and corresponding experience with discipline) may influence his or her perceptions of parents' behavior. Additionally, prior studies have not yet tested preregistered hypotheses

concerning parenting strategies and cyberbullying – a critical step in light of recent open science reforms (see Munafò et al., 2017). The present study aimed to address these gaps by recruiting a large sample of parent-child dyads wherein parents' reports of their own strategies of regulating cyberbullying behavior were linked to adolescent reports of their actual engagement in cyberbullying. Two types of parenting strategies were examined with respect to cyberbullying – autonomy support and control – as this type of problem behavior has been thought to be especially sensitive to a controlling style of parenting (Volk et al., 2012).

Results consistently supported preregistered hypotheses concerning autonomy-supportive parenting strategies and underscore its explanatory power in terms of adolescent cyberbullying. Specifically, autonomy-supportive parenting strategies related to lower cyberbullying behavior in adolescents (H1), as well as lower reactance (H3), and reactance explained, in part, why autonomy support predicted lower cyberbullying in adolescents (H5). However, results revealed mixed support for hypotheses relating to controlling parenting strategies. When aggregated with all theoretically-grounded elements of control (use of guilt and shame, conditional regard, and the use of punishment), controlling parenting predicted *less* cyberbullying in adolescents – the opposite of what was predicted in Hypothesis 2. Furthermore, controlling parenting strategies did not relate to reactance as hypothesized (H4 and H6). To better understand potential nuances in how controlling parenting strategies might predict adolescent cyberbullying, follow-up exploratory analyses revealed two distinct dimensions of controlling parenting strategies showing somewhat opposite patterns of effects. The first control dimension of guilt, shame, and conditional regard was statistically distinct from autonomy support, and showed the expected pattern of findings on the basis of extant theory: these parenting strategies related to more cyberbullying in adolescents because of greater adolescent reactance to parents. The second

control dimension of punishment had more shared variance with autonomy-supportive strategies than with the controlling strategies of guilt, shame, and conditional regard, and it showed the opposite pattern of findings than what was expected: punishment related to less cyberbullying in adolescents (and did not relate to reactance). Importantly, regardless of how parental control was computed, a consistent, and considerably larger effect size for autonomy-supportive strategies emerged (R^2 of .09) relative to controlling ones (R^2 of .01-.03) with respect to observed variance in cyberbullying. Further, effects of autonomy support remained robust in the face of different, and equally defensible, statistical models, but this was not the case for control. This suggests that it may be particularly important for parents to use autonomy-supportive strategies when regulating their adolescents' engagement in deviant social behaviors, whereas the use of controlling strategies, for good or ill, may have a practically insignificant impact on behavior (Lakens, 2017).

These data suggest that punishing behavior in the context of dealing with problematic social behavior may not necessarily represent a form of parental control. This finding, though unexpected from a motivational perspective (e.g., punishing poor performance leads to more disengagement and lower well-being; Baard, Deci, & Ryan, 2004) and from prior work on bullying (e.g., a punitive parenting style predicts greater engagement in bullying; Baldry and Farrington, 2005), is in line with other work showing that when youth expected to be punished by their parents for cyberbullying, they engaged in it less (Hinduja & Patchin, 2013). In the specific context of cyberbullying or regulating other problem behaviors, punishment may be acting as a form of *structure*, or provision of clear and consistent rules and expectations, which is conducive to supporting adolescents' need for autonomy (Grolnick & Pomerantz, 2009). It is likely then that autonomy-supportive parents in this sample who used punishment may have

created a regulatory climate wherein the consequences of problematic social behavior were clear and transparent. Arguably then, failing to punish behavior in this context may be more characteristic of *lassiez-faire* or permissive parenting. In other words, the use of punitive consequences may be a strategy autonomy-supportive parents could use to respond to problem behaviors in their children, alongside other autonomy-supportive strategies supported by the extant literature as well as by these data (e.g., taking the adolescent's perspective). For example, parents may seek to understand why their child spread a rumor about a classmate online, discipline their child by restricting Internet access for a period of time, and provide a rationale for this punishment. This points to a nuanced and fascinating area of future research to understand more about the role of punishment in autonomy-supportive parenting when adolescents engage in deviant social behavior such as cyberbullying.

Findings are consistent with work showing that supportive parenting behaviors protect against cyberbullying in adolescents, and this work builds on this research in a number of ways. For one, though a handful of studies have examined links of parent characteristics with bullying or cyberbullying (e.g., Lereya et al., 2013), parents' reports of their own autonomy supportiveness were examined here, and were linked with adolescents' reports of their own engagement in cyberbullying. This was particularly important methodologically as adolescents engaging in delinquent behaviors could presumably project seemingly negative interpersonal qualities onto their parents. Further, while prior studies have examined autonomy-supportive parenting predicting both antisocial behaviors (Joussemet et al., 2008) and reactivity (Vansteenkiste et al., 2014) in adolescents, this work showed evidence of a mediational pathway through which autonomy-supportive parenting strategies predict lower reactance among adolescents, and in turn, lower engagement in antisocial behaviors like cyberbullying. The

theory-testing approach applied here provides a template for future studies into this phenomenon as both the confirmatory hypothesis testing and exploratory analyses yielded distinct empirical insights, which will inform the field in different yet complimentary ways (Munafò et al., 2017).

These advances should be considered in light of several limitations of the current research. Most notably, these data were cross-sectional, and while this work conceptualizes parent autonomy support as influencing adolescent engagement in cyberbullying, it is quite plausible that child behaviors drove parents' strategies of regulating cyberbullying in more controlling ways. In other words, parents of adolescents who engage in deviant social behaviors like cyberbullying may rely on more controlling tactics to reduce this undesirable behavior. In support of this view, these data show that parents who were more concerned about their children cyberbullying were less autonomy supportive, and used more guilt, shame, and conditional regard with them (see Table 1). Furthermore, it is plausible that both concerns and parenting styles emerged, at least in part, from a general orientation within the parent to regulate adolescents' behaviors in certain ways, rather than from dynamics specific to those adolescents' behaviors (Ryan & Deci, 1985). Importantly, exploratory analyses showed that autonomy-supportive and controlling parenting strategies remained significant predictors of adolescent cyberbullying after statistically controlling for parent concern. These findings are consistent with work showing bidirectional or reciprocal effects: Parents can change their parenting approaches in response to deviant or antisocial behavior in their children, in addition to parenting approaches impacting adolescents' engagement in deviant behavior (Dishion, Nelson, & Bullock, 2004). Similarly, Vansteenkiste and colleagues (2014) found that autonomy-supportive parenting strategies reduced oppositional defiance over time, and at the same time oppositional defiance in children led parents to use fewer autonomy-supportive strategies of communicating limits. It

seems plausible then that similar reciprocal effects between parent autonomy support and cyberbullying behavior might be observed. Thus, future research should follow youngsters and their parents over time to understand trajectories of deviant behavior like cyberbullying in adolescents. Understanding the directionality of these links is crucial to developing family-based interventions. If indeed there are reciprocal effects, it is critical to develop interventions that disrupt this negative spiral for more productive conversations between parents and their adolescents. Future work should also use behavioral or observational methods to code autonomy-supportive strategies exhibited by parents, perhaps from observational studies of parent-child conversations in the lab; doing this would reduce the bias inherent in self-reported accounts.

The findings of this study have important implications for research. This mixed results concerning controlling parenting strategies speak to underlying measurement and conceptual issues that future research on behavior regulation of adolescents, generally, and of cyberbullying specifically, should carefully consider. These results suggest that the parenting strategy of punishment, in particular, should be revisited in future work to investigate whether or not it operates as a form of controlling parenting, especially in the context of regulating problem behaviors in adolescents. Further, this work speaks to the importance of both exploratory and confirmatory research in advancing both the literatures of self-determination theory and cyberbullying. Finally, further work on this topic should investigate reciprocal effects of parenting strategies and adolescent behaviors with longitudinal designs.

This work also has implications for interventions with adolescents. Interventions aimed at reducing cyberbullying and perhaps other problem behaviors among adolescents would benefit from involving parents directly to guide them in using more autonomy-supportive strategies. Self-determination theory has a strong tradition of creating effective interventions and trainings

to increase autonomy support among parents, teachers, health care providers, and others (e.g., Ryan, Patrick, Deci, & Williams, 2008). For example, a recent parenting intervention called the *How-to Parenting Program* was effective at increasing autonomy support and structure in parents, and follow-ups showed a decrease in internalizing and externalizing problems in their children (8-12 year olds; Joussemet, Mageau, & Koestner, 2014). Adapting such interventions for parents of older children and adolescents, particularly as they navigate prohibiting problematic behaviors in their children such as cyberbullying, may further promote resilience in youth as they confront opportunities to harm or bully others. In this way, autonomy-supportive parenting interventions may be an effective means of curbing bullying behaviors while promoting children's subsequent health and adjustment (Crick, Ostrov, & Werner, 2006).

Conclusion

Cyberbullying is a growing problem behavior among youth with adverse health outcomes for both victims and perpetrators (e.g., Przybylski & Bowes, 2017). A handful of studies have examined how parenting styles predict engagement in bullying and cyberbullying, though they tend to rely on youth reporting on their parents' behavior (a problematic method given their perceptions may be influenced by their own bullying behavior and reactivity towards their parents). Further, there have been no preregistered studies in the area of parenting and cyberbullying, or in the broader fields of cyberbullying and traditional bullying. To address these gaps, this study preregistered hypotheses testing the links between two types of parenting strategies – autonomy-support and control – in regulating adolescent engagement in cyberbullying using a large sample of parent-child dyads. Results consistently revealed that parents who used autonomy-supportive strategies had children who engaged in cyberbullying less, whereas controlling strategies showed mixed findings. Further, the reason that autonomy-

supportive strategies were more effective was because they lowered adolescents' reactance towards their parents' attempts at regulating their behavior. This study underscores the importance of the behavioral regulation strategies used by parents as they attempt to reduce adolescent problem behaviors, and in this case, cyberbullying. These findings may apply to other forms of problem behaviors common in adolescence (e.g., problem drinking, smoking, risky sexual behaviors). It seems likely that autonomy-supportive parenting strategies would show similarly beneficial effects to those seen in this study and others (e.g., in curbing excessive screen time, Bjelland et al., 2015). As adolescence is a period marked by increased engagement in problematic behavior (Steinberg, 2007), this preregistered study confirming that autonomy-supportive parenting strategies are more effective than control for curbing problem behavior is thus an important contribution to the study of adolescence.

References

- Ahmed, E. & Braithwaite, V. (2004). Bullying and victimization: Cause of concern for both families and schools. *Social Psychology of Education, 7*(1), 35–54.
- Assor, A., Roth, G., & Deci, E. L. (2004). The emotional costs of parents' conditional regard: A Self-Determination Theory analysis. *Journal of Personality, 72*(1), 47-88.
- Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-Being in two work settings. *Journal of Applied Social Psychology, 34*(10), 2045-2068.
- Baldry, A. C. (2003). Bullying in schools and exposure to domestic violence. *Child Abuse & Neglect, 27*(7), 713-732.
- Baldry, A. C., & Farrington, D. P. (2005). Protective factors as moderators of risk factors in adolescence bullying. *Social Psychology of Education, 8*(3), 263-284.
- Bjelland, M., Soenens, B., Bere, E., Kovács, É., Lien, N., Maes, L., ... & Te Velde, S. J. (2015). Associations between parental rules, style of communication and children's screen time. *BMC Public Health, 15*(1), 1002.
- Copeland, W. E., Wolke, D., Angold, A., & Costello, E. J. (2013). Adult psychiatric outcomes of bullying and being bullied by peers in childhood and adolescence. *JAMA Psychiatry, 70*(4), 419-426.
- Crick, N. R., Ostrov, J. M., & Werner, N. E. (2006). A longitudinal study of relational aggression, physical aggression, and children's social-psychological adjustment. *Journal of Abnormal Child Psychology, 34*(2), 127-138.
- Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality, 19*(2), 109-134.

- Dehue, F., Bolman, C., Vollink, T., & Pouwelse, M. (2012). Cyberbullying and traditional bullying in relation to adolescents' perception of parenting. *Journal of Cybertherapy & Rehabilitation, 5*(1), 25-34.
- Dishion, T. J., Nelson, S. E., & Bullock, B. M. (2004). Premature adolescent autonomy: Parent disengagement and deviant peer process in the amplification of problem behaviour. *Journal of Adolescence, 27*, 515-530.
- Festl, R., Scharrow, M., & Quandt, T. (2013). Peer influence, internet use and cyberbullying: A comparison of different context effects among German adolescents. *Journal of Children and Media, 7*(4), 446-462.
- Gagné, M. (2003). The role of autonomy support and autonomy orientation in prosocial behavior engagement. *Motivation and Emotion, 27*(3), 199-223.
- Gov.uk (2018). *Ethnic groups by region*. Retrieved from <https://www.ethnicity-facts-figures.service.gov.uk/ethnicity-in-the-uk/ethnic-groups-by-region>
- Grolnick, W. S. (2009). The role of parents in facilitating autonomous self-regulation for education. *School Field, 7*(2), 164-173.
- Grolnick, W. S., & Pomerantz, E. M. (2009). Issues and challenges in studying parental control: Toward a new conceptualization. *Child Development Perspectives, 3*(3), 165–170.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis*. New York: Guilford Press.
- Hinduja, S., & Patchin, J. (2013). Social influences on cyberbullying behaviors among middle and high school students. *Journal of Youth and Adolescence, 42*(5), 711–722.

- Joussemet, M., Mageau, G. A., & Koestner, R. (2014). Promoting optimal parenting and children's mental health: A preliminary evaluation of the how-to parenting program. *Journal of Child and Family Studies, 23*(6), 949-964.
- Joussemet, M., Vitaro, F., Barker, E. D., Côté, S., Nagin, D. S., Zoccolillo, M., & Tremblay, R. E. (2008). Controlling parenting and physical aggression during elementary school. *Child Development, 79*(2), 411-425.
- Kowalski, R. M., Giumetti, G. W., Schroeder, A. N., & Lattanner, M. R. (2014). Bullying in the digital age: A critical review and meta-analysis of cyberbullying research among youth. *Psychological Bulletin, 140*(4), 1073-1137.
- Lakens, D. (2017). Equivalence tests: A practical primer for *t* tests, correlations, and meta-analyses. *Social Psychological and Personality Science, 8*(4), 355–362.
- Legault, L., Gutsell, J. N., & Inzlicht, M. (2011). Ironic effects of antiprejudice messages: How motivational interventions can reduce (but also increase) prejudice. *Psychological Science, 22*(12), 1472-1477.
- Lereya, S. T., Samara, M., & Wolke, D. (2013). Parenting behavior and the risk of becoming a victim and a bully/victim: A meta-analysis study. *Child Abuse & Neglect, 37*(12), 1091-1108.
- Li, Q. (2007). New bottle but old wine: A research of cyberbullying in schools. *Computers in Human Behavior, 23*(4), 1777-1791.
- Munafò, M. R., Nosek, B. A., Bishop, D. V. M., Button, K. S., Chambers, C. D., Percie du Sert, N., ... Ioannidis, J. P. A. (2017). A manifesto for reproducible science. *Nature Human Behaviour, 1*(1), 0021.

Office for National Statistics (2018, January 10). *Household disposable income and inequality in the UK: Financial year ending 2017*. Retrieved from:

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householddisposableincomeandinequality/financialyearending2017>

Pomerantz, E. M., Ng, F. F., & Wang, Q. (2008). Culture, parenting, and motivation: The case of East Asia and the United States. In M. L. Maehr, S. A. Karabenick, & T. C. Urdan (Eds.), *Advances in motivation and achievement: Social psychological perspectives, 15*, 209-240.

Przybylski, A. K., & Bowes, L. (2017). Cyberbullying and adolescent well-being in England: A population-based cross-sectional study. *The Lancet Child & Adolescent Health, 1*(1), 19-26.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York: Guilford.

Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2008). Facilitating health behaviour change and its maintenance: Interventions based on self-determination theory. *European Health Psychologist, 10*(1), 2-5.

Shields, A., & Cicchetti, D. (2001). Parental maltreatment and emotion dysregulation as risk factors for bullying and victimization in middle childhood. *Journal of Clinical Child Psychology, 30*(3), 349-363.

Silva, M. N., Marques, M. M., & Teixeira, P. J. (2014). Testing theory in practice: The example of self-determination theory-based interventions. *European Health Psychologist, 16*(5), 171-180.

Soenens, B., & Vansteenkiste, M. (2010). A theoretical upgrade of the concept of parental psychological control: Proposing new insights on the basis of self-determination theory. *Developmental Review, 30*(1), 74-99.

Soenens, B., Vansteenkiste, M., & Niemiec, C. P. (2009). Should parental prohibition of adolescents' peer relationships be prohibited?. *Personal Relationships, 16*(4), 507-530.

Steinberg, L. (2007). Risk taking in adolescence: New perspectives from brain and behavioral science. *Current Directions in Psychological Science, 16*(2), 55-59.

Stewart, R. W., Drescher, C. F., Maack, D. J., Ebesutani, C., & Young, J. (2014). The development and psychometric investigation of the Cyberbullying Scale. *Journal of Interpersonal Violence, 29*(12), 2218-2238.

Vansteenkiste, M., Soenens, B., Van Petegem, S., & Duriez, B. (2014). Longitudinal associations between adolescent perceived degree and style of parental prohibition and internalization and defiance. *Developmental Psychology, 50*(1), 229-236.

Volk, A. A., Camilleri, J. A., Dane, A. V., & Marini, Z. A. (2012). Is adolescent bullying an evolutionary adaptation?. *Aggressive Behavior, 38*(3), 222-238.

Wang, J., Iannotti, R. J., & Nansel, T. R. (2009). School bullying among adolescents in the United States: Physical, verbal, relational, and cyber. *Journal of Adolescent Health, 45*(4), 368-375.

Wolke, D., Lereya, T., & Tippet, N. (2016). Individual and social determinants of bullying and cyberbullying. In T. Völlink, F. Dehue, & C. Mc Guckin (Eds), *Cyberbullying: From theory to intervention* (pp. 26-53). London: Routledge.

Ybarra, M., & Mitchell, K. J. (2004). Online aggressor/targets, aggressors and targets: A comparison of associated youth characteristics. *Journal of Child Psychology and Psychiatry*, 45(7), 1308–1316.

Table 1

Means, Standard Deviations, and Correlations Between Study Variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Autonomy support	5.10	0.83	--							
2. Control (full)	4.55	0.96	.43***	--						
3. Shame & guilt	3.86	1.30	.10***	.81***	--					
4. Punishment	4.85	1.18	.45***	.86***	.48***	--				
5. Reactance	2.59	0.98	-.18***	.04	.18***	-.04	--			
6. Cyberbullying	1.46	0.73	-.30***	-.09**	.12***	-.16***	.44***	--		
7. Concern	1.10	1.49	-.17***	-.05	.11***	-.09**	.31***	.46***	--	
8. Female	--	--	.06*	.02	.02	.00	-.03	-.04	-.08**	--
9. White	--	--	.04	.04	.00	.06*	.03	-.04	-.06*	.01

Notes. Correlations based on $N = 1,004$ parent-child dyads; Control (full) represents all elements of control aggregated, and concern represents parents' concern that the child is engaged in cyberbullying. Autonomy support, control, shame and guilt, and punishment use a scale ranging from 1-6; Reactance, cyberbullying, and concern child is cyberbullying use a scale of 1-5.

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

Table 2

Parenting Styles Predicting Cyberbullying Behaviors and Reactance in Adolescents

	Cyberbullying			Reactance		
	<i>B (S.E.)</i>	95% CI	<i>R</i> ²	<i>B (S.E.)</i>	95% CI	<i>R</i> ²
Confirmatory analyses						
Autonomy support	-.29** (.03)	[-.35, -.23]	.09	-.22** (.04)	[-.29, -.14]	.03
Control (full)	-.07* (.03)	[-.13, -.02]	.01	.04 (.03)	[-.03, .10]	.001
Exploratory analyses						
Shame & guilt	.07** (.02)	[.04, .11]	.01	.13** (.02)	[.09, .18]	.03
Punishment	-.11** (.02)	[-.15, -.07]	.03	-.03 (.03)	[-.09, .02]	.002

Notes. *B*s represent the unstandardized regression coefficients, *S.E.*s are their standard errors, 95% CIs are their 95% confidence intervals, and *R*² is the proportion of variance explained by the predictor. Control in confirmatory analyses represents all elements of control aggregated, and shame and guilt, and punishment represent two distinct dimensions of control found in exploratory analyses.

p* < .01, *p* < .001