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Reference:

Erreygers Sara, Pabian Sara, Vandebosch Heidi, Baillien Elfi.- Helping behavior among adolescent bystanders of cyberbullying : the role of impulsivity
Learning and individual differences - ISSN 1041-6080 - (2016), p. 1-7
Full text (Publishers DOI): <http://dx.doi.org/doi:10.1016/j.lindif.2016.03.003>
To cite this reference: <http://hdl.handle.net/10067/1330390151162165141>

Helping Behavior Among Adolescent Bystanders of Cyberbullying: The Role of Impulsivity

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Abstract

Impulsivity has a significant impact on behavior during adolescence. Moreover, previous research has shown associations between impulsivity (or low self-control) and perpetration and victimization of cyberbullying. However, the influence of impulsivity on bystander behavior has not been investigated yet, although bystanders play an important role in bullying situations. The present study examined the relationship between impulsivity and helping behavior in bystanders of cyberbullying. To predict the likelihood of helping a victim when witnessing cyberbullying, we collected self-reported data from a representative sample of 2309 pupils, aged 9 to 17. The results suggested that more impulsive adolescents were less likely to help the cybervictim. An explanation for the findings may be that helping behavior in a cyberbullying context requires inhibitory abilities which are deficit in impulsive adolescents. These findings could be used to inform intervention strategies about which factors are associated with bystander behavior in cyberbullying and how to target these.

Keywords: cyberbullying; bystander behavior; impulsivity; inhibition; helping

1. Introduction

Digital media are of primary importance in the lives of many adolescents. Recent findings show that 55% of European children access the internet daily from their bedroom and 17% do this daily when they are out and about (Mascheroni & Cuman, 2014). Digital media provide children with opportunities, but also expose them to risks. One of these risks is cyberbullying: “An aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him- or herself” (Smith et al., 2008, p. 376). Cyberbullying perpetration and victimization can be associated with various psychosocial problems, such as low self-esteem, psychological distress, anxiety, depression and school problems (Campbell, Slee, Spears, Butler, & Kift, 2013; Cénat et al., 2014; Dooley, Shaw, & Cross, 2012; Fletcher et al., 2014; Hinduja & Patchin, 2007). Therefore, countering cyberbullying and its consequences is crucial. In this respect, research on traditional bullying has revealed the important role of peer bystanders (Salmivalli, Voeten, & Poskiparta, 2011): Bystanders can help victims by defending them, by comforting them or by offering advice. Yet, to date, knowledge about bystander reactions towards cyberbullying victims is rather limited. In this study, we explore the characteristics of bystanders that may influence their helping behavior towards cyberbullying victims. We are particularly interested in the role of impulsivity: Especially during adolescence this personality facet significantly influences behavior, as it plays an important role in the development of problem behavior (Levesque, 2012).

1.1. Impulsivity and (Cyber)bullying Victimization and Perpetration

Impulsivity is “a predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions to the impulsive individual or to others” (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001, p. 1784). Impulsivity (or lack of self-control) (Duckworth & Kern, 2011) has been linked to

victimization and perpetration of traditional and cyberbullying. Individuals who score higher on impulsivity or lower on self-control are more prone to be victims or perpetrators of traditional and cyberbullying (Fanti, Demetriou, & Hawa, 2012; Jenkins, Demaray, Fredrick, & Summers, 2014; Pabian & Vandebosch, 2015; Vazsonyi, Macháčková, Sevcikova, Smahel, & Cerna, 2012).

1.2. Impulsivity in Bystander Behavior

Whereas studies have researched the association of impulsivity with cyberbullying victimization and perpetration, impulsivity's relation to bystander behavior in bullying situations has not been investigated to date. Studying the role of impulsivity in cyberbullying bystander behavior is valuable, however. First, as in traditional bullying, bystanders are also often present during cyberbullying situations, although they might play a different role (Barlińska, Szuster, & Winiewski, 2013; Williford et al., 2013). For instance, bystanders in traditional bullying are present at the moment of the incident, whereas this is not necessarily the case in cyberbullying: Bystanders can witness cyberbullying incidents (long) after the actual messaging or posting online took place. As long as the material is still online or circulating, bystanders have the option to react (Van Cleemput, Vandebosch, & Pabian, 2014). Moreover, whereas bystanders in traditional bullying are physically present and visible, cyberbystanders may be invisible. In addition, the size of the audience and the number of bystanders can be much larger in cyberbullying (Heirman et al., 2016), and the relational proximity of the audience to the involved individuals is often greater (witnesses can easily be strangers). Second, as in traditional bullying, bystanders of cyberbullying can show three types of reactions, which can alter the consequences for the victim and the perpetrator (Bastiaensens et al., 2014): (1) (Active) negative bystander behavior: reinforcing the cyberbully, joining in on or encouraging the cyberbullying ; (2) (Active) positive bystander behavior: helping or defending the victim, standing up against the cyberbully, asking for help,

reporting the incident or comforting or supporting the victim; and (3) Passive bystander behavior: doing nothing or pretending to ignore the situation. These broadly defined categories can be refined into smaller categories (e.g., DeSmet et al., 2014).

Which type of reaction a bystander chooses, depends on contextual and personal factors. Regarding contextual factors, direct requests for help from the victim (Macháčková, Dedkova, Sevcikova, & Cerna, 2013), incident severity (Bastiaensens et al., 2014), other bystanders' identity (good friends vs. acquaintances, Bastiaensens et al., 2014), the bystander's popularity (DeSmet et al., 2014), the victim's reactions (Holfeld, 2014), witnessing others behaving prosocially (Niblack, 2013), and parental monitoring (Niblack, 2013) have been related to positive bystander behavior. As for person-related factors, noticing the incident (Freis & Gurung, 2013), feeling upset by witnessing victimization (Macháčková et al., 2013), the relationship with the victim (DeSmet et al., 2014; Macháčková et al., 2013), low moral disengagement (DeSmet et al., 2014), general prosocial tendencies (Macháčková et al., 2013), personal experience with cyberbully victimization (Niblack, 2013), and positive beliefs about cyberspace (Li & Fung, 2012) were all found to be positively related to positive bystander behavior. In contrast, a strong relation with the bully seems to inhibit positive bystander behavior (Macháčková et al., 2013). Despite these insights, impulsivity's role in cyberbullying bystander behavior has not received attention so far. Given the association of impulsivity with cyberbullying perpetration and victimization, this personality factor might however also be relevant for cyberbystanders, and particularly regarding their helping behavior.

In this study we focus on helping behavior, because of its direct influence on the negative effects of cybervictimization. In particular, when bystanders take sides with the cybervictim, they send a signal that the victim is not alone and that the cyberbullying act is

wrong. In addition, by providing social support, bystanders can attenuate the negative effects of victimization (Brody, 2013; Flaspohler, Elfstrom, Vanderzee, Sink, & Birchmeier, 2009).

1.3. The Role of Impulsivity in Helping Behavior

Impulsivity consists of two central facets: sensitivity to reward or drive, and disinhibition (Levesque, 2012). Disinhibition refers to unrestrained behavior, which may be particularly relevant in bystander and helping behavior. Disinhibition has mostly been linked to behaving antisocially, yet could also trigger prosocial behavior (Hirsh, Galinsky, & Zhong, 2011; Steele, Critchlow, & Liu, 1985). For instance, when disinhibited by alcohol intoxication, some people become more aggressive while others behave more helpful. How individuals behave depends on the most salient response option in a situation, which is influenced by dispositional and contextual factors (Hirsh et al., 2011). Because of their dispositionally high levels of disinhibition, impulsive individuals may generally experience less response conflict in social situations (Hirsh et al., 2011). When witnessing a cyberbullying incident, helping the victim may or may not be the most salient response option.

Thus, one possibility is that impulsivity relates negatively to adolescents' cyberbystander helping behavior. This would be in line with research linking impulsivity to more antisocial and less prosocial behavior (e.g., Andrade & Tannock, 2012; Diamantopoulou, Henricsson, & Rydell, 2005; McMahon et al., 2013; Ohan & Johnston, 2007). Furthermore, research on traditional bullying bystander behavior suggests that children who defend victims are better at inhibiting default, intuitive responses than children who bully (Monks, Smith, & Swettenham, 2005). In other words, helpers have lower levels of disinhibition than bullies. Moreover, this seems to suggest that bystander helping behavior is not an intuitive, dominant response option. In fact, Eisenberg, Fabes, and Spinrad (2006) argue that helping (or prosocial) behavior often requires self-regulating, inhibition and

reflection abilities. Consequently, impulsive adolescents may have more difficulty to engage in helping behavior than non-impulsive adolescents.

Another possibility is that impulsivity relates positively to cyberbystander helping behavior. When bystanders help a victim, this might have negative consequences for both parties: Bystanders may become victims themselves (DeSmet et al., 2012) or they may embarrass the victim (Thornberg, 2007). These negative consequences are often cited by passive bystanders as reasons for not helping. However, impulsive individuals do not consider the consequences of their actions for themselves or others before reacting (Moeller et al., 2001). Therefore, they could be more likely to help when witnessing cyberbullying, if they would help impulsively without regard for the possible negative consequences. Piliavin, Pilavin, and Rodin (1975) have similarly argued that impulsive helping, or immediate helping that does not seem to involve a conscious decision-making process, happens under specific circumstances or when bystanders have specific traits. However, it remains unclear whether impulsivity as a personality trait suffices to induce a higher likelihood to help.

1.4. Other Factors Related to Bystander Behavior in Cyberbullying and Impulsivity

Impulsivity may be an important factor related to cyberbystander behavior. However, other personal characteristics also influence this behavior. Previous research has documented associations of age, gender and empathy with bystander behavior and impulsivity.

1.4.1. Age & gender.

Findings about the association of bystander behavior with gender and age are mixed. Only Bastiaensens and colleagues (2014) reported a significant gender difference: Girls had a higher tendency to display positive, and boys to display negative bystander behavior. Other studies did not find a significant gender effect (Barlińska et al., 2013; Bastiaensens et al., 2015; Li & Fung, 2012; Macháčková et al., 2013; Van Cleemput et al., 2014). Research on

the relationship between gender and impulsivity suggests a weak or inconsistent association (Cross, Copping, & Campbell, 2011).

Regarding age, Van Cleemput and colleagues (2014) found that older adolescents were more likely to show negative and passive, and less likely to show positive bystander behavior. In contrast, age was not a significant predictor in two other studies (Bastiaensens et al., 2015; Macháčková et al., 2013). Research on age-effects in impulsivity suggests that adolescence is characterized by high impulsivity, due to developmental changes in neural functions (Gullo & Dawe, 2008). To account for possible age or gender effects, these variables are included as controls in our analysis.

1.4.2. Empathy.

Of the several personality factors that have been linked to cyberbullying, empathy consistently emerges as an important predictor. Studies have revealed negative associations of empathy with cyberbullying perpetration (Ang & Goh, 2010; Renati, Berrone, & Zanetti, 2012; Schultze-Krumbholz & Scheithauer, 2013; Steffgen, König, Pfetsch, & Melzer, 2011) and with negative cyberbystander behavior (Barlińska et al., 2013; Van Cleemput et al., 2014), versus positive associations with cyberbystander helping behavior (Kowalski, Schroeder, & Smith, 2013; Van Cleemput et al., 2014). Empathy refers to sharing the emotional state of another person through taking the other's perspective and understanding his or her emotions (Eisenberg & Strayer, 1987; Eisenberg, 2000). From this definition, some researchers have proposed that empathy and impulsivity are contrasting concepts and may therefore be negatively correlated (Kozéki & Berghammer, 1992). Because of the central role of empathy in (cyber)bullying behavior and the proposed negative association with impulsivity, we account for this variable in our analysis.

1.5. This Study

As discussed above, impulsivity and cyberbystander helping behavior may be related either positively or negatively. Furthermore, as explained earlier, other factors related to cyberbystander behavior and impulsivity can influence adolescent bystanders' helping behavior. Therefore, this study examines the relationship between impulsivity and helping behavior for cyberbullying witnesses, taking other potentially influencing factors into account. Our research question is:

Is impulsivity related to helping behavior in adolescent bystanders of cyberbullying, when taking other personal factors (age, gender, empathy, and experiences with cyber- and traditional bullying) into account?

2. Method

2.1. Participants

The data were collected in October–November 2011 as part of a larger study, involving 519 primary (9 to 11 year-olds) and 1,814 secondary school children (12–16 year-olds) in [regional origin deleted in order to maintain the integrity of the review process] ($M_{\text{age}} = 12.6$ years; 50.3% boys). Participants were selected using stratified random cluster sampling with type of schooling (technical, vocational, and general secondary education) and grade as sampling criteria. Because the distribution of students across these criteria diverted slightly from the population average, results were weighted based on the relative population proportions. Since we were interested in bystander helping behavior, our subsample consisted of the participants who had witnessed cyberbullying at least once in the past six months ($n = 808$).

Missing values on all dependent and independent variables were replaced using multiple imputation, which is seen as the most optimal technique to handle missing data when the dependent variable is a binary variable (Peeters, Zondervan-Zwijnenburg, Vink, & van de

Schoot, 2015). We used the Multiple Imputation feature of SPSS version 22 to impute 20 datasets. The reported results are based on analyses of the imputed datasets.

2.2. Measures

The survey contained several sections with questions about biographical information, experiences with cyberbullying and traditional bullying as a perpetrator, victim and bystander, psychosocial characteristics, and internet and mobile phone use. We explained to the participants what we meant with “bullying” (cf. Olweus, 1993): “We call it bullying when people say or do mean or hurtful things more than once, when the bully wants to make the other person feel bad and when it is difficult for the victim to defend himself or herself. Friends teasing each other is not bullying.” We then explained that bullying can not only happen at school, on the street, etc. but also through the internet or mobile phones. After providing some examples, we assessed participants’ experience with perpetration, victimization and witnessing of both types of bullying.

2.2.1. Involvement in traditional bullying and cyberbullying.

Because individuals’ experiences with bullying influence how they react when witnessing cyberbullying (Barlińska et al., 2013; Niblack, 2013; Van Cleemput et al., 2014), we assessed participants’ personal experiences with traditional and cyberbullying, using single-item measures (cf. Hinduja & Patchin, 2008; Menesini & Nocentini, 2009; Wegge, Vandebosch, Eggermont, & Pabian, 2014). The students were asked how often they had been involved in bullying as a perpetrator, victim or witness in the last six months. The response categories were “never”, “once in the past six months”, “a few times in the past six months”, “once a month”, “a few times a month”, and “several times a week”.

2.2.2. Bystander behavior.

Participants who had witnessed cyberbullying at least once were asked how they had reacted. They could choose “I joined the bully” as a measure of negative, “I helped the victim” as a measure of positive, and “I did nothing” as a measure of passive bystander behavior.

2.2.3. Impulsivity.

Impulsivity was measured by the Barrat Impulsiveness scale (BIS-11) (Stanford et al., 2009). This 4-point Likert scale, ranging from 1 (*totally disagree*) to 4 (*totally agree*), taps into the disinhibition-domain of impulsivity (Gullo & Dawe, 2008). Three of the 11 items were recoded so that higher scores reflected higher impulsivity. Three items with factor loadings below .30 were excluded from the scale (Pabian, De Backer, & Vandebosch, 2015). Cronbach’s alpha of the final eight item scale was .67. The range of the factor loadings was .38 - .79.

2.2.4. Empathy.

A modified version of the Olweus and Endresen (2001) empathic responsiveness scale was used to measure (affective) empathy. The scale consisted of 8 items (same 4-point Likert scale as above), e.g. “When I see someone who is sad, I want to comfort him or her”. Cronbach’s alpha was .87 and factor loadings ranged from .57 to .83.

2.3. Procedure

The data were collected through pen and paper surveys. Administration took place at school during school hours by teachers and in the researcher’s presence. The students and their parents provided passive informed consent before the survey administration. All except eight students received parental consent and participated.

3. Results

3.1. Descriptive Statistics

Of the total sample, 64.4% ($n = 1,485$) indicated that they had never witnessed cyberbullying in the past six months, 13.0% ($n = 299$) once in the past six months, 13.6% ($n = 313$) a few times in the past six months, 1.9 % ($n = 44$) once a month, 3.7% ($n = 85$) a few times a month, and 2.9 % (67) several times a week. Of the participants who had witnessed cyberbullying at least once ($n = 808$), 37 students (4.6%) indicated having joined the bully, 342 (42.3%) had helped the victim and 433 (53.6%) had done nothing.

Descriptive statistics and zero-order correlations for the variables included in our analyses are presented in Table 1. Impulsivity was positively correlated with age ($r = .28, p < .001$), being a victim of cyberbullying ($r = .06, p = .006$), being a perpetrator of cyberbullying ($r = .20, p < .001$) and traditional bullying ($r = .17, p < .001$), and witnessing cyberbullying ($r = .17, p < .001$) and traditional bullying ($r = .17, p < .001$), whereas it was negatively correlated with empathy ($r = -.25, p < .001$). Boys ($M = 2.33$) were more impulsive than girls ($M = 2.24$).

Table 1

Zero-Order Correlations and Descriptive Statistics for Predictor Variables (imputed data)

Variable	1	2	3	4	5	6	7	8	9	10
1 Gender (girl = 1)										
2 Age	-.03									
3 CBV	.09**	-.06**								
4 CBP	-.04	.15**	.21**							
5 CBB	-.05*	.27**	.22**	.37**						
6 TBV	.05	-.18**	.29**	.13**	.12**					
7 TBP	-.10**	.04	.10**	.47**	.29**	.28**				
8 TBB	-.03	.09**	.13**	.25**	.39**	.28**	.39**			
9 Empathy	.37**	-.24**	.03	-.14**	-.10**	.08**	-.16**	-.03		
10 Impulsivity	-.10*	.28**	.06**	.20**	.17**	.03	.17**	.17**	-.25**	
11 Help	.10**	-.22**	.14**	-.07**	-.01	.16**	-.07	-.04	.32**	-.18**
<i>M</i>	0.48	12.70	1.20	1.18	1.75	1.68	1.41	2.37	3.02	2.29
<i>SD</i> ^a	0.50	1.83	0.70	0.63	1.26	1.27	0.87	1.53	0.54	0.49
<i>Observed range</i>	0-1	9-17	1-6	1-6	2-6	1-6	1-6	1-6	1-4	1-4

Note. CBV = cyberbullying victimization; CBP = cyberbullying perpetration; CBB = cyberbullying bystander; TBV = traditional bullying victimization; TBP = traditional bullying perpetration; TBB = traditional bullying bystander.

^a SDs of imputed data could not be obtained, therefore SDs of the original data are reported.

* $p < .05$; ** $p < .01$.

3.2. Association of Impulsivity with Cyberbystander Helping Behavior

To explore the influence of impulsivity on helping behavior among cyberbullying bystanders, we conducted a hierarchical logistic regression analysis (Table 2). Cyberbystander helping behavior was a dichotomous variable (dummy coded: 0 = *did not help the victim*; 1 = *helped the victim*). Age, gender and personal bullying experiences were entered in step 1. By including age, gender and bully variables as control variables, we accounted for their possible effects on helping. The psychosocial variables (empathy and impulsivity) were entered in step 2. Finally, personal bullying experiences, as well as empathy, might influence associations between impulsivity and helping. Therefore we entered two-way interaction terms of all of the bullying variables and empathy with impulsivity in step 3.

Adding the main effects of empathy and impulsivity significantly improved the fit of the model (step 2 $\chi^2 = 60.84$, $df = 2$, $p < .001$, Nagelkerke $\Delta R^2 = .28$). Adding the two-way

interaction effects of impulsivity with empathy and the bullying variables neither significantly improved model fit (step 3 $\chi^2 = 7.47$, $df = 9$, $p = .589$, Nagelkerke $\Delta R^2 = .290$), nor generated significant interaction effects; therefore we do not display the parameter estimates here. Based on the model fit and percentage of explained variance, the step-2-model was selected as the final model.

Table 2

Hierarchical Logistic Regression Analysis on Cyberbystander Helping Behavior

	B	OR	95% CI of OR
<i>Step 1: main effects of gender, age and bullying variables</i>			
Step $\chi^2 = 91.60^{***}$; $df = 8$; Nagelkerke $\Delta R^2 = .18$. Model $\chi^2 = 91.60^{***}$; $df = 8$; Nagelkerke $R^2 = .18$.	Gender (girl = 1) Age CBV CBP CBB TBV TBP TBB	0.30 -0.24*** 0.36*** -0.23 0.06 0.19** -0.27* 0.07**	1.34 [0.70 - 0.88] [1.17 - 1.75] [0.62 - 1.02] [0.92 - 1.22] [1.06 - 1.38] [0.61 - 0.95] [0.97 - 1.20]
<i>Step 2: adding main effects of psychosocial variables</i>			
Step $\chi^2 = 60.84^{***}$; $df = 2$; Nagelkerke $\Delta R^2 = .10$. Model $\chi^2 = 152.435^{***}$; $df = 10$; Nagelkerke $R^2 = .28$.	Gender (girl = 1) Age CBV CBP CBB TBV TBP TBB Empathy Impulsivity	-0.16 -0.16* .40*** -0.16 0.09 0.19* -0.19 0.07 1.17*** -0.44*	0.86 [0.75 - 0.98] [1.21 - 1.85] [0.65 - 1.12] [0.94 - 1.27] [1.04 - 1.39] [0.65 - 1.04] [0.96 - 1.20] [2.09 - 4.95] [0.45 - 0.93]
<i>Step 3: adding interaction effects with impulsivity</i>			
Step $\chi^2 = 7.47$; $df = 9$; Nagelkerke $\Delta R^2 = .01$. Model $\chi^2 = 159.90^{***}$; $df = 19$; Nagelkerke $R^2 = .29$.			No significant interactions.

Note. Parameter estimates are based on analyses with 20 imputed datasets using multiple imputation. Model fit and explained variances are not available for imputed data, therefore those numbers presented here are from analyses with the original dataset with listwise missings. CBV = cyberbullying victimization; CBP = cyberbullying perpetration; CBB = cyberbullying bystander; TBV = traditional bullying victimization; TBP = traditional bullying perpetration; TBB = traditional bullying bystander; Imp = impulsivity; Emp = Empathy.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

In the final model, age predicted helping behavior ($OR = 0.85, p = .022$): Younger adolescents were more likely to help than older adolescents. Further, being a victim of cyber ($OR = 1.50, p < .001$) or traditional ($OR = 1.20, p = .012$) bullying predicted a higher likelihood of helping behavior. Both empathy and impulsivity had a significant effect on the likelihood to help the cybervictim. The more empathic adolescents were, the more likely they were to help the victim ($OR = 3.22, p < .001$); and the more impulsive adolescents were, the less likely they were to demonstrate cyberbystander helping behavior ($OR = .65, p = .020$).

4. Discussion

This study's aim was to examine the role of impulsivity in helping behavior among adolescent bystanders of cyberbullying. To explore the association between impulsivity and helping behavior, we used logistic regression analyses, while accounting for possible confounding effects of age, gender, experiences with cyber- and traditional bullying and empathy. Two possibilities were considered: (1) Either impulsive adolescents could be less likely to help because helping behavior may require self-regulatory and inhibitory abilities, which impulsive adolescents lack, (2) or impulsive adolescents could be more likely to help a cybervictim because they may help impulsively without considering the possible negative consequences for themselves or others. Our results support the first possibility, even when accounting for demographic and personal variables.

First, although more than half of the adolescents in our sample who had witnessed cyberbullying admitted that they had reacted passively, 42.3% indicated that they had helped the victim. Only 37 respondents admitted having joined the bully, but this number may be an underestimation due to a social desirability response bias. However, since participants could choose multiple response options regarding their bystander behavior, it is unlikely that this bias affected the choice for the "helping" response option. The finding that most witnesses do

not intervene is in line with previous research about (cyber)bullying bystander behavior (Craig & Pepler, 1997; Huang & Chou, 2010; Shultz, Heilman, & Hart, 2014).

Furthermore, age was associated with the likelihood to help cybervictims: Older adolescent where less likely to help. Whereas some previous studies did not find a significant age effect (Bastiaensens et al., 2015; Macháčková et al., 2013), these results corroborate grade effects in traditional bullying (Trach, Hymel, Waterhouse, & Neale, 2010). It seems that with age, adolescents feel more restrained or reluctant to help (cyber)victims, perhaps because older adolescents are more concerned with the judgment of their behavior by peers. There were no gender differences in cyberbystander helping behavior. Of the variables measuring involvement in traditional and cyberbullying, only bullying victimization was associated with helping behavior: The more adolescents had been victimized in the past six months, the more likely they were to help as a bystander. This confirms previous findings relating victimization experiences to positive cyberbullying bystander behavior (Niblack, 2013). Having personally experienced being bullied may heighten students' arousal when they witness others being cyberbullied by activating memories and associated feelings of their own experience. This heightened arousal could be reduced by helping the victim, as predicted by the arousal: cost-reward model of bystander behavior (J. A. Piliavin, Dovidio, Gaertner, & Clark, 1981).

Thirdly, as expected and in accordance with previous research, empathy was strongly related to helping: More empathic adolescents were more likely to help cybervictims than less empathic peers. Empathy encompasses the ability to understand and share the other's experience and frame of reference. When adolescents high in empathy witness someone being cyberbullied, they are more prone to place themselves in the victim's shoes and consequently feel more motivated to take action and help the victim, compared to less empathic adolescents.

In our sample the older the adolescents were, the lower they scored on both helping behavior and empathy, whereas the higher they scored on impulsivity. Interestingly, impulsivity related negatively with cyberbystander helping behavior, even when accounting for personal bullying experiences and empathic concern: Less impulsive adolescents were more likely to help the victim when witnessing cyberbullying than adolescents high in impulsivity. The findings suggest that general impulsivity may not be a sufficient condition for cyberbystander helping behavior. As suggested, a possible explanation might be that performing helping behavior requires self-regulation, reflection and inhibition (Eisenberg et al., 2006), which are abilities that are less developed in impulsive individuals (Fite, Goodnight, Bates, Dodge, & Pettit, 2008; Levesque, 2012).

Another factor that may help explain the findings is that when people witness cyberbullying, the incident need not have taken place at the same time. For example, adolescents could have witnessed someone posting a nasty video of someone else on Facebook, but only a day after the bully put the video online. This could influence how bystanders react (Van Cleemput et al., 2014): Perhaps impulsive adolescents would be more inclined to help a victim when they witness cyberbullying directly as it happens, but less inclined to help when they witness it at a point later in time. However, with our data it was not possible to assess the synchronicity of the cyberbullying incident and the bystanders' reaction.

Van Cleemput, Vandebosch, and Pabian (2014) have revealed other reasons that adolescent bystanders provide to explain why they do not intervene, such as the relationship with the victim or the perpetrator. These reasons and other factors previously identified to be related to cyberbullying bystander behavior (see § 1.3.) may moderate the relationship of impulsivity with helping behavior. For instance, when an impulsive adolescent witnesses a close friend being cyberbullied, he or she might be triggered faster to help the victim than a non-impulsive peer.

An alternative explanation for the failure to find evidence for impulsive helping could be that impulsivity rather influences the *speed* of taking action and helping than the likelihood to perform this behavior. Accordingly, impulsive individuals would help more rapidly but not more often. This would be in line with findings from a study by Staub, Erkut and Jaquette (unpublished study, cited in Staub, 2003), in which people who made faster reactions in a matching test also responded faster in a bystander situation, although their likelihood of responding was not higher. Unfortunately it was not possible to examine this possibility with our data.

Since bystanders' reactions in bullying situations are of crucial importance to the situation's outcome and the effects on the involved individuals (e.g. Salmivalli et al., 2011), interventions targeting cyberbullying should aim to increase positive bystander behavior. First, as empathy is positively related to helping behavior, cyberbullying intervention programs might benefit from including strategies designed to increase empathy in bystanders. Secondly, our results suggest that impulsivity is negatively related to positive bystander behavior. Since self-control can be seen as a muscle that can be strengthened with exercise (Strayhorn, 2002), helping in cyberbullying situations might be stimulated by training adolescents in reflection and self-regulation. Moreover, students can be assisted in selecting an appropriate response when witnessing cyberbullying. Through repeated modeling of and hands-on experience with helping in hypothetical cyberbullying situations, these reactions can become the dominant response option in cyberbullying situations. This could be achieved through in-class discussions of possible reactions to cyberbullying and through peer modeling and role-playing of active helping behavior. Serious games targeting bystanders of cyberbullying (e.g. Van Cleemput, Vandebosch, Bastiaensens, DeSmet, & Debourdeaudhuij, 2015) build on this idea as well.

A number of limitations of this study need to be addressed. First, cross-sectional data do not allow for causal conclusions regarding the relation between helping cybervictims and associated variables. Furthermore, other factors and characteristics, such as the relational proximity of the victim, could have an influence. Future studies using longitudinal or experimental research designs could shed light on the direction of the associations and the influence of other variables. Secondly, the measure for our dependent variable (helping) was a single-item dichotomous variable. The independent variables measuring involvement in (cyber)bullying were also single-item measures. There is an ongoing debate in the literature about the most appropriate method to measure (cyber)bullying, and some authors have argued that using multi-item measures is more valid and reliable than using single-item measures (Berne et al., 2013; Menesini & Nocentini, 2009). Future research could benefit from using multi-item scales of helping and (cyber)bullying involvement. Thirdly, the internal consistency of the scale measuring impulsivity was acceptable, but not high (Cronbach's $\alpha = .67$), likely due to low inter-item correlations. Using an alternative, more reliable measure of impulsivity would be advised future research. Fourthly, this study used self-reported data. A social desirability bias may have increased participants' reported propensity to engage in helping behavior, even though we highlighted the confidentiality and anonymity of participants' responses during the administration of the questionnaire. Observations or peer-reports could be used in future research to compare the reported helping rates across methods. Nevertheless, helping behavior in cyberbullying situations is not always visible to outsiders, which supports the utility of self-report methods.

Notwithstanding these limitations, the results suggest that witnesses' impulsivity plays a substantial role in cyberbystander helping behavior. More impulsive adolescents are less inclined to help a victim when they witness cyberbullying, compared to less impulsive peers. Self-control (or low impulsivity) could thus be a factor fostering positive bystander behavior.

Our study is the first to establish this link between impulsivity or self-control and helping behavior for witnesses of bullying. Although more research is needed to confirm these findings in other samples and to investigate the causal nature of the association between impulsivity and helping, our study draws attention to the important and understudied influence of personality characteristics and cognitive processes in adolescent bystander behavior.

5. References

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Acknowledgments

This work was supported by Fonds Wetenschappelijk Onderzoek [grant number FWO G.0335.14N].