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Peer Influence as a Predictor of Producing and Distributing Hurtful Images of Peers and
Teachers Among Flemish Adolescents

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Abstract

This study examines whether self-perceived popularity, need for popularity and peer pressure explain teenagers' use of the mobile phone to make and distribute hurtful pictures and videos of peers and teachers. A large-scale quantitative survey study among 1787 Flemish high school pupils in 2010 revealed that, in the six months prior to the study, 25% of adolescents had made a picture/video of a peer who was being ridiculed, 8% of a peer who was being physically bullied, and 11% had distributed such a picture/video online. Thirteen per cent had made a picture/video of a teacher being ridiculed, and 6% had distributed such content online. Self-perceived popularity, need for popularity and perceived peer pressure positively predicted adolescents' involvement in several of the above practices. The results suggest that greater investments need to be made to counter the social rewards that adolescents receive when engaging in these bullying practices.

Keywords: adolescents, teachers, bullying, cyberbullying, mobile phone, happy slapping, popularity, peer pressure, need for popularity

word count: 8213

Peer Influence as a Predictor of Producing and Distributing Hurtful Images of Peers and Teachers Among Flemish Adolescents

In only 15 years, mobile phones have evolved from basic communication technologies to high-tech multi-media devices that are fully integrated into adolescents' daily lives. Although appraised for the greater autonomy that they bring in the support of social relationships (Ling & Yttri, 2006), these multi-media devices also afford adolescents to engage in new, aggravated forms of harassment that rely on the production and distribution of hurtful pictures and videos (Smith et al., 2008). These behaviors can be considered as specific forms of 'cyberbullying' that have detrimental effects on youngsters' health and quality-of-life (e.g. Bonanno & Hymel, 2013; Menesini, Calussi, & Nocentini 2012; Ortega et al., 2012).

Literature has pointed towards the importance of peer influence as an explanatory factor for *offline* bullying and aggression towards both peers (e.g., Ahn, Garandeanu & Rodkin, 2010; Andreou, 2006; Closson, 2009; Hawley, 2002; Hoff, Reese-Weber, Schneider & Stagg, 2009) and teachers (de Bruyn & Cillessen, 2006; Hopmeyer, Kim & Schimmelbusch, 2002). In research on *cyberbullying* the social contexts in which these practices occur are also recently being explored (Bastiaensens et al., 2015; Festl, Scharkow, & Quandt, 2013; Wegge, Vandebosch, Eggermont, & Pabian, 2014). Drawing from the results of a large-scale quantitative survey study among 1787 teenagers (12-18 years), this study adds to the growing body of literature on the relationship between peer influence and cyberbullying by investigating whether adolescents' perceptions of three aspects of peer influence, namely their popularity, need for popularity and peer pressure predict their involvement in the production and distribution of hurtful pictures and videos of peers and teachers with their mobile phone.

Making and Distributing Hurtful Pictures or Videos of Peers and Teachers

The use of the mobile phone for making and distributing hurtful pictures and videos of peers and teachers can be considered a specific form of cyberbullying, in that the behavior

may be: (1) intentionally harmful, (2) carried out “repeatedly and over time”, and (3) taking place in an interpersonal relationship characterized by an imbalance of power (see e.g., Olweus, 1999, p. 10; Smith et al., 2008, p. 376). The anytime anyplace connectivity afforded by mobile technology makes this form of bullying unrestricted to time and space; the bully can operate semi-anonymously, and – when distributing the imagery offline or online to others, the instances of bullying can become visible to a large audience (Dooley, Pyżalski, & Cross, 2009; Menesini & Nocentini, 2009; Vandebosch & Van Cleemput, 2008).

Although the use of the mobile phone for making and distributing hurtful pictures and videos of peers and teachers has not yet explicitly been reported on in previous studies, there are some indications of its prevalence and severity in the extant body of cyberbullying research. With respect to peer-to-peer bullying, Smith et al. (2008) found that 5% of 533 pupils (UK, 49.0% boys, age range: 11-16) reported being a victim of picture/video clip bullying (not necessarily through mobile phones), and 1.8% claimed to be a perpetrator. Pupils estimated the impact of picture/video clip bullying to be higher than the impact of traditional bullying. In a study among 1092 Italian adolescents (49.1% males, age range: 11-18), Menesini et al. (2011) found that 6% had already become photographed or videotaped at least once while being the victim of a *violent* scene, and 8% while being a victim of an *intimate* scene. These incidences show that the use of digital technology to intentionally produce hurtful imagery of peers is not a marginal phenomenon. Moreover, given that these ‘visual’ acts of bullying are considered the most severe acts of cyberbullying (Menesini et al., 2011), they may have severe consequences for the wellbeing of a substantial number of adolescents.

The phenomenon of students bullying or harassing their teachers has received less attention. The scarce literature shows, however, that this is a serious and worldwide problem for contemporary teachers (for a review, see: Kauppi & Pörhölä, 2009). In a study among 215

Finnish teachers, Kauppi and Pörhöla (2012b) found that 7.6% of teachers who reported having been bullied by their pupils ($N=70$), had been a victim of cyberbullying. While the cyberbullying of teachers has received less scholarly attention, its impact on teachers' job satisfaction and wellbeing may be significant. Hence, it is important to understand why teenagers use technology to harass and bully teachers.

Before addressing the potential role of peer influence it is important to determine the conceptual boundaries of the cyberbullying behaviors under scrutiny. Although the practices examined in this study all involve the use of mobile technologies, the *production* of hurtful imagery by means of a mobile phone can be identified as a form of offline bullying, in that the bullying activity takes place at a particular place and time, and (likely) involves a 'live audience' of peers. When peers intentionally *distribute* these kinds of pictures and videos online, however, these actions can be identified as cyberbullying because they are now accessible to a wider audience, disregarding time or place. In addition, following Menesini et al. (2011), we can differentiate between acts where pictures/videos are made of a victim being *physically harassed or bullied* (e.g., spat on, pushed, beaten, tripped, physically threatened, ...), and acts where pictures/videos are made of a victim being *intentionally ridiculed* (e.g., making a picture of someone using the bathroom, ...). Given the conceptual differences between the above practices, in the current study we treat five separate practices as potential outcomes of peer influence: (1) producing a picture/video of a peer to ridicule him/her, (2) producing a picture/video of a peer who is physically bullied (e.g., entrapped, pushed, hit or spat on) or beaten, (3) distributing such a picture/video of a peer on the Internet, (4) producing a picture/video of a teacher to ridicule him/her, and (5) distributing such a picture/video of a teacher on the Internet.

Peer Influence and Offline Aggression

Peer influence is recognizable in those dynamics that structure the organization of adolescent peer groups. A first dynamic that characterizes the social organization of adolescent peer groups is peer popularity. Peer popularity is determined by an adolescent's social prominence and dominance in the peer group (Allen, Porter, McFarland, Marsh & McElhaney, 2005; Coie, Dodge & Coppotelli, 1982). Socially dominant peers have greater 'power' or influence over other persons in the peer group (Parkhurst & Hopmeyer, 1998; Closson, 2009). This influence may be prosocial in nature, for example, in the form of prosocial leadership, but it may also be antisocial in nature, in the form of rude, arrogant, aggressive and sometimes even delinquent behavior with which adolescents express and establish their power over others (Closson, 2009; Andreou, 2006; Ahn, Garandeau & Rodkin, 2010; Parkhurst & Hopmeyer, 1998).

It is particularly when social dominance takes on the latter form, that peer popularity can be associated with (cyber)bullying (e.g., de Bruyn, Cillessen, & Wissink, 2010; Wegge, Vandebosch, Eggermont, & Pabian, 2014) and disobedient, anti-authoritative classroom behavior (e.g. talking back to the teacher, goofing around) (Hopmeyer et al., 2002; de Bruyn & Cillessen, 2006). Adolescents who have already achieved a popular status may feel protected, and therefore free to act aggressively towards peers and teachers without having to fear negative social consequences (Brechwald & Prinstein, 2011). In addition, adolescents may engage in antisocial behavior strategically, in order to gain or reinforce social dominance (Hawley, 2002; Andreou, 2006; Closson, 2009; Dijkstra, Lindenberg, Verhulst, Ormel & Veenstra, 2009; Ahn, Garandeau & Rodkin, 2010). Support for the latter perspective can be found in a study by Sijtsema, Veenstra, Lindenberg and Salmivalli (2009), who found that bullying was not only related to 'achieved' popularity but also to the status goals that teens strived for: bullying was more common among teens who attached higher importance to being

more popular. Both being popular and wanting to be popular may thus explain why adolescents engage in bullying behavior.

A second form of peer influence that characterizes adolescent peer groups is peer pressure. Peer pressure refers to the influence that peers exert over each other to engage in or conform to certain behaviors (Berndt, 1979; Brown, Clasen & Eicher, 1986; Brown & Dietz, 2009; Steinberg & Silverberg, 1986; Sumter, Bockhorst, Steinberg & Westenberg, 2009). Peer pressure is a powerful coercive force that finds its origin in the fundamental human desire to form part of an in-group (cf. Tajfel, 1978). Adolescents thus conform to the norms of the peer group and the associated peer pressure in order to maintain group membership (Gavin & Furman, 1989).

In adolescent peer cultures, values and ideals may differentiate from or even conflict with those of mainstream culture. Consequently, behaviors that involve transgressions of authority or of societal/school rules may be deviant in mainstream culture, but normative in a peer group's culture, and therefore the object of peer pressure. This explains why peer pressure is found to motivate adolescents to comply with 'pro-bullying' group norms, even if they have negative (or at least neutral) attitudes toward bullying themselves (e.g. Espelage, Green, & Polanin, 2012; Gini, 2006; Hamarus & Kaikkonen, 2008). In addition to (the need for) popularity, peer pressure thus also explains why adolescents engage in bullying behavior.

Peer Influence and Producing and Distributing Hurtful Imagery with Mobile Phones

Central to the relationship between peer influence and offline antisocial behavior, is that peers are able to witness or take notice of the behavior (Salmivalli, 2010). After all, it is only through other peers' awareness of the antisocial behavior that one may achieve or consolidate membership and status in the peer group. Offline antisocial behavior can be witnessed by an offline, unmediated public when adolescents 'perform' the antisocial behavior in front of a group of peers (e.g., physically bullying a peer on the playground or talking back to a teacher

in the classroom). With the advent of digital technology, however, these performances may now also take place in front of a mediated, networked public (cf. boyd, 2007; Marwick & boyd, 2011; Sticca & Perren, 2013), for example, when someone posts an aggressive message on a peer's wall or on a social network site.

Mobile phones are interesting technologies for adolescents because they enable both. First, they allow the real-time capturing of incidents of a friend behaving antisocially towards a peer or a teacher. By using the phone for the production of such a picture or video, adolescents emphasize the performative aspect of such antisocial behavior, as the recording presents irrefutable proof of the incident. Adolescents may record their own antisocial behavior, but they may also record a friend behaving aggressively; the recording of such behavior implies that at least one other person was present to witness it. Second, the phone enables adolescents to distribute captured material across mobile communication networks and the internet. Such distribution gives other peers the opportunity to view, edit, store, search, copy and re-distribute the digital performance (cf. boyd, 2007; Marwick & boyd, 2011), thereby allowing the performance to persist online among a large, partly invisible audience (Nocentini et.al, 2010; Vandebosch & Van Cleemput, 2009).

It is likely that peer influence plays a role in the production and distribution of hurtful imagery of peers and teachers. Adolescents who perceive themselves as more popular among their peers may feel less inhibited to produce and distribute such content because they feel protected by their status in the peer group. Adolescents with a greater need for popularity may hope to score among their friends, and thus strategically enhance their social status in the peer group by recording the antisocial behavior. Finally, adolescents who experience greater peer pressure from friends may be more likely to engage in this antisocial behavior. Hence, we expect that self-perceived popularity (H1), need for popularity (H2) and perceived peer pressure (H3) positively predict how frequently adolescents make a picture/video of a peer to

ridicule him/her (H1a/2a/3a), make a picture/video of a peer who is physically bullied/beaten (H1b/2b/3b), distribute such a picture/video of a peer over the internet (H1c/2c/3c), make a picture/video of a teacher to ridicule him/her (H1d/2d/3d), and distribute such a picture/video of a teacher on the Internet (H1e/2e/3e) (see Figure 1).

Gender, age, school track and the type of phone adolescents own are relevant control variables for our study. Boys are known to engage more in overt, physical forms of aggression. As a result, they may be more involved in the production of imagery of a peer who is physically bullied than girls. A similar pattern may be found among younger adolescents, whom are found to engage more frequently in overt forms of aggression (e.g., Olweus, 1993), presumably because popularity (Gavin and Furman, 1989) and peer conformity (Berndt, 1979) matters more to them. With respect to school track, previous studies found increases in ‘deviant’ behaviors among lower-track youths as a reaction against school culture (which they feel is ‘irrelevant’ for their future) (e.g., Van Houtte & Stevens, 2008). (cyber)bullying is one such behavior (e.g., Walrave & Heirman, 2011; Festl & Quandt, 2011). Finally, the study took place in 2010, a time when only a minority of Flemish young people had a smartphone with which they could easily access the 3G Internet. Given that Internet access facilitates the distribution of hurtful content, we included type of phone as a fourth control variable.

[insert Figure 1 about here]

Method

Sample and Procedure

In 2010 a large-scale survey study was carried out among a randomly stratified sample of high schools in Flanders, Belgium. Anonymous questionnaires were administered to pupils

during study hours in their classroom or in a study hall. This procedure resulted in an initial sample of 1943 pupils that came from 13 different schools and 30 different classrooms. Not all pupils succeeded in finishing the survey within the assigned time period, and the dependent measures were placed at the end of the survey. We retained those adolescents who completed at least one measure, which resulted in a final sample of 1787 adolescents.

The sample was representative in terms of gender (50.4% males), age ($M = 15.38$ years, $SD = 1.87$, $Min = 10.32$, $Max = 20.71$) and school track for the population of high school pupils in Flanders. A third (33%) of the respondents attended middle school (years 7-8), 29.7% junior high (years 9-10) and 37.3% high school. Of the 72.5% of respondents who were able to report parents' highest earned degree, a majority (65%, respectively 61.6%) indicated that their mothers (respectively fathers) had obtained a higher education degree, which is somewhat higher than in the general population. The distribution of (ISCO-classified) occupations also showed a slightly higher proportion of higher-class occupations than in the general population: 13.3% of mothers (resp. 32.5% of fathers) had a lower-class occupation, 25.4% (resp. 12.4%) a middle-class occupation and 61.3% (resp. 55.1%) a higher-class occupation.

Admitting to cyberbullying one's peers and teachers may be risky for adolescents in terms of its potential (legal and school) consequences. Hence, precautionary measures were taken to ensure the anonymous and confidential treatment of the responses. Our university's IRB argued that there were no ethical considerations preventing this study.

Measures

Production and distribution of hurtful pictures/videos. We asked respondents: "How frequently have you used your mobile phone in the past 6 months... (1) to make a

picture/video of a peer to ridicule¹ him/her,” (2) “to make a picture/video of a peer who is physically bullied/beaten,” (3) “to distribute this kind of picture/video over the Internet (e.g., via e-mail, SNS, youtube),” (4) “to make a picture/video of a teacher to ridicule him/her,” and (5) “to distribute this kind of picture/video over the Internet (e.g., via e-mail, SNS, youtube).” The response categories for these questions were ‘never’ (coded 1), ‘once’, ‘a number of times (2 to 3 times)’, ‘several times (about once every month)’ and ‘regularly (more than once a month)’ (coded 5).

Self-perceived popularity. We relied on a self-reported measure of popularity rather than on a peer nominated (i.e. ‘other-perceived’) measure of popularity. Although popularity is strictly speaking an attribute that the peer group assigns to you, Mayeux and Cillessen (2008) found that self- and other-perceived popularity are significantly related to one another, and that self-perceived popularity moderates the relationship between other-perceived popularity and aggression, from which they conclude that it is not just *being* popular that matters, but *knowing* it too. We assessed adolescents’ perception of their own popularity using three items out of the social self-concept scale from Marsh’s (1992) self-description questionnaire (see table 1). The response scale ranged from 1 (totally disagree) to 6 (totally agree). The mean popularity-score was 3.98 ($SD = 0.92$; $\alpha = .69$).

Need for popularity. Adolescents’ need for popularity was measured using five items from Santor et al.’s (2000) need for popularity scale, which assesses to what extent adolescents “act in certain ways out of a desire to be popular with others” (p. 165; see table 1). The response scale ranged from 1 (totally disagree) to 4 (totally agree). On average, respondents reported not having a particularly great desire for popularity ($M = 2.06$, $SD = 0.55$; $\alpha = .77$).

¹ The meaning of the Dutch verb ‘to ridicule’ lies closely to the meaning of ‘to humiliate’.

Perceived peer pressure. To assess perceived peer pressure, we adapted the three-item peer pressure subscale from Buhrmeister's (1992) Network of Relations Inventory – Relational Quality Version (NRI-RQV) so that it measures peer pressure from friends in general rather than from one specific friend. An exemplary item is “How often do your friends push you to do things that you don't want to do?” The response categories ranged from 1 ((almost) never) to 5 ((almost) always). On average, respondents reported feeling little pressure coming from their peers ($M = 1.94$, $SD = .78$; $\alpha = .75$).

Type of mobile phone. Respondents were asked what type of mobile phone they used: a basic mobile phone without any multimedia features (coded 1), a phone with multimedia features, or (3) a high-end smartphone (e.g., Iphone, ...) (coded 3). At the time of the study, 5.6% of the sample owned a basic phone, 76.3% a ‘regular’ multimedia phone, and 18.1% a high-end smartphone.

Gender, age and school track. Gender was coded as 1 for male, 2 for female. Age was calculated by subtracting the date of birth from the date on which the questionnaire was administered. We asked respondents whether they attended a vocational (coded 1), semi-academic or academic school track (coded 3). Of our total sample, 41.6% respondents were in an academic school track, 34.4% in a semi-academic school track and 24% in a vocational school track.

Data Preparation and Preliminary Analyses

Given that our data were gathered by means of a multistage sampling procedure, the observations are nested in potentially meaningful social groups at the classroom- and school-level. When not accounted for, this nesting may lead to parameter estimates that are overvalued in terms of their contribution to the outcome variable (Hox, 2010). We ran a linear mixed model analysis in SPSS 20 for each of the dependent variables in which we entered the three main predictor variables as fixed effects, and the school and classroom (within the

school) as random effects. These analyses revealed no significant school-level nor classroom-level variability in the dependent variables (all Intraclass Correlation Coefficients < .04), which implies that we can fit the theoretical model without taking random effects into account.

Before fitting the theoretical model, we calculated a measurement model for the latent variables in Mplus 6 (Byrne, 2012; Muthén, & Muthén, 2010), using ML estimation. Missing data were handled using maximum likelihood estimation. Need for popularity, peer pressure and self-perceived popularity were allowed to co-vary.

Because the X^2 statistic is known to inflate when large samples are used, it is advised to examine additional indices to assess model fit, such as the Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI). These indices are relatively unaffected by sample size (Schermelleh-Engel et al., 2003). An RMSEA-value below .05 (respectively .08) and a CFI-value above .95 (respectively .90) indicate a close (respectively acceptable) model fit (Schermelleh-Engel et al., 2003).

We first examined the fit of the measurement model. In light of the evaluative criteria, the results indicated an acceptable fit ($\chi^2(41) = 216.057$, $p = 0.00$; CFI = .96, RMSEA = .048, [.041, .054]; see Table 1 for the full measurement model).

[insert Table 1 about here]

Results

Descriptives

The most prevalent behavior reported by our respondents was using the mobile phone to make a picture or video of a peer to ridicule him/her, which one in four (24.6%) adolescents claimed to have done at least once in the past six months (see table 2). Almost eight per cent

(7.7%) shot a picture or video from a peer being beaten or physically bullied in the past six months. Eleven per cent (11.1%) of respondents indicated having distributed such a picture or video of a peer over the Internet.

[insert table 2 about here]

Approximately one in eight respondents (13.3%) reported having made a hurtful picture or video of a teacher to ridicule him/her in the past six months. Six per cent (6.1%) reported having distributed such a picture or video over the Internet in the past six months.

Adolescents who reported having engaged more frequently in one of the above behaviors, were significantly more likely to also have engaged in the other forms of bullying ($r > .17$, $p < .01$).

Next, we fitted the theoretical model as presented in Figure 1, using weighted least squares estimation, corrected for means and variances (WLSMV) in MPlus to account for the categorical nature of the data (Byrne, 2012, p. 132). Missing data were handled using maximum likelihood estimation. Results are depicted in Figure 2. The model fitted the data well, $\chi^2(116) = 621.21$, $p < .001$, $CFI = .93$, $RMSEA = .048$ [.045,.053].

Figure 2 shows the final model with standardized beta weights for the parameter estimates. The model shows that hypothesis 2a was not supported: teens who have a greater need for popularity, did not report using their mobile phone more frequently for making a picture or video from a peer to ridicule him/her ($\beta = .07$, $p = .095$). Apart from that hypothesis, however, all other hypothesized relationships were supported: self-perceived popularity and peer pressure significantly predicted the use of the mobile phone to make and distribute imagery of peers and teachers to ridicule them, and the use of the mobile phone to make imagery of a peer being physically bullied/beaten (see Table 3). Need for popularity

predicted the use of the mobile phone to make a picture or video of a peer being physically bullied/beaten ($\beta = .18, p < .000$) and of a teacher to ridicule him/her ($\beta = .13, p = .002$). Need for popularity also predicted how frequently the adolescents reported distributing such pictures/videos of peers ($\beta = .15, p = .008$) and teachers ($\beta = .20, p = .021$).

[insert Figure 2 about here]

[insert Table 3 about here]

Several relationships between the control variables and the main variables in our model were found (see Table 3). Boys reported having made a picture or video of a peer to ridicule him/her and a peer being physically bullied/beaten more frequently than girls (see table 3). Younger teens also reported having made a picture or video of a peer being physically bullied/beaten more frequently than older teens. School track also appeared an important predictor. As expected, teens in more vocationally oriented school tracks reported having made a picture or video of a peer being physically bullied/beaten more frequently than teens in academically oriented tracks. These teens also reported having distributed hurtful pictures/videos of peers and teachers online more frequently than their peers in more academically oriented school tracks. Finally, the multimedia and internet capacity of teenagers' phones was a consistent predictor, as each of the outcome measures was reported more frequently by teens who owned a more sophisticated mobile phone.

We examined whether gender, age and school track moderated the aforementioned relationships. To that end, we performed multiple group analyses in which we compared boys versus girls ($\chi^2 (336) = 7799.60, p < .001, CFI = .93, RMSEA = .048 [.045, .053]$), younger versus older adolescents (using a mean split of the sample at $M_{age} = 15.28$) ($\chi^2 (336) = 7769.37, p < .001, CFI = .94, RMSEA = .047 [.043, .051]$) and adolescents in academic tracks

versus technical/vocational tracks ($\chi^2 (336) = 7983.28, p < .001, CFI = .94, RMSEA = .047$ [.043,.051]). Multigroup comparisons in Mplus using the Wald Test of Parameter Constraints, however, revealed that although there are substantial differences in some of the regression weights, none of these differences reached statistical significance.

The results revealed that the outcome items co-varied considerably. Hence, we examined whether the data would also support a single latent ‘mobile bullying’ factor. Confirmatory factor analysis in SPSS indeed showed support for a single factor solution (Cronbach’s Alpha: .77) and the measurement model in Mplus showed a reasonably good fit ($\chi^2 (5) = 91.16, p < .001, CFI = .98, RMSEA = .10$ [.08,.12]).

A structural equation model including the latent ‘mobile bullying’ factor showed reasonable model fit, $\chi^2 (149) = 764.77, p < .001, CFI = .92, RMSEA = .05$ [.044,.051]. In the model, self-perceived popularity appeared the strongest predictor of mobile bullying ($\beta = .23, p < .001$), followed by perceived peer pressure ($\beta = .21, p < .001$) and need for popularity ($\beta = .16, p < .001$; table 4).

[insert Table 4 about here]

Discussion

This study explored the role of status dynamics and peer influence in explaining adolescents’ use of the mobile phone for making and distributing hurtful imagery of peers and teachers. The results reveal significant associations between perceptions of peer influence and the forms of (cyber)-bullying examined. Although the magnitude of the regression weights point towards a weak relationship and the cross-sectional study design limits making causal claims, the consistency of the findings lend support to what has already been found in earlier studies, namely that the peer context is essential to understand the link between aggression and (cyber)bullying behavior during the adolescent life phase (e.g., Staff and Kreager, 2008; Espelage et al., 2003; Salmivalli, 2010; Wegge et al., 2014).

Our findings draw attention to the specific role of the mobile phone in teen's bullying practices, something that has been overlooked in most (cyber)bullying research. As this study suggests, mobile technologies are characterized by affordances that make them attractive tools for (cyber)bullying: teenagers may consider the production of hurtful imagery as part of a bullying 'performance', they may use a mobile phone to produce digital evidence of a bullying incident, and they may use their phone to distribute contents while 'under the radar' of authority figures (cf. Ling, 2005). Particularly the possibility to forward messages within dense social networks such as those of adolescents, implies that messages can reach a sizeable and 'well-targeted' public within a short period of time (even if a message is forwarded to one person at a time). In this way a diverse range of 'bystanders' can witness the (cyber)bullying, such as people from the victim or bully's close social circle (offline and in real time or online and delayed), but also a wider audience of peers.

This study is one of the first studies to explore the use of mobile phones for the bullying of teachers. While a longer tradition exists in research on students' misbehavior or even violent behavior towards teachers in general (Chen & Astor, 2008; Fisher & Kettl, 2003; James et al., 2008; Kauppi & Pörhölä, 2012a, 2012b), knowledge with regard to underlying explanations for these behaviors is lacking. The results in our study suggest that aside to looking for explanatory factors in the teachers themselves (demographic characteristics, physical appearance, communication style, ...), or in the characteristics of individual students (student's mental health, problems of parenting) (e.g. Kauppi & Pörhölä, 2012b), the dynamics within the classroom or larger peer group should also be taken into account.

For practitioners who want to create evidence-based interventions, the study findings suggest that greater investments need to be made to counter the positive outcomes that adolescents expect when making and sending hurtful pictures and videos. This may be done, for example, by also emphasizing negative outcomes (chance to get caught, chance of losing

friends...), or by trying to raise adolescents' skills and self-efficacy in resisting peer pressure. The results moreover encourage practitioners to further explore the potential of 'peer-oriented' models (e.g. Menesini, Nocentini, & Palladino, 2012) and programs that focus explicitly on the role of group dynamics (Salmivalli, Kärnä, & Poskiparta, 2011) to counter cyberbullying. In these programs, audiences or 'bystanders' are encouraged to defend the victim (online or offline), comfort the victim (online or offline) or report the bullying (to a teacher or to the software provider) instead of reinforcing the bully by remaining passive or joining in (e.g. liking or sharing a video).

The observation that both peers and teachers are common targets of (cyber)bullying illustrates the pervasiveness of the problem and its potential impact on the school community at large. This again urges for the use of a whole-school-approach (WSA) in addressing the problem (Pearce et al., 2011). A WSA involves students, teachers, parents and the wider community, in actions aiming at the prevention, detection and solution of (cyber)bullying issues. With regard to preventative actions, research suggests that school environments that foster open communication and positive relations amongst students and teachers, in this way generate more school and teacher bonding (Waters, Cross & Runions, 2009). Both school and teacher bonding have been associated (and longitudinally linked) with lower levels of (cyber)bullying perpetration (Hinduja and Patchin, 2012 ; Pabian and Vandebosch, 2016).

The perceived peer influence measures had an independent contribution to the practices examined. This finding indicates that it makes sense to theoretically and analytically disentangle them. Theoretically, teasing apart the mechanisms that tie popularity, need for popularity and peer pressure to bullying behavior may give us a better understanding of the role of aggression in processes of social dominance and prominence, and may shed further light on process-models of (cyber)bullying. Analytically, the insights can be used to identify profiles of teenagers who are more at risk of being or becoming a perpetrator, victim or

bystander. These profiles, then, can be used by practitioners to target their interventions concerning these aggravated forms of bullying more precisely (for example by aiming them at boys or students from lower educational levels who appear socially dominant).

Several of the control variables significantly predicted the outcome measures. Boys were found to be more likely to produce hurtful pictures/videos of a peer, and younger adolescents to produce a picture or video of a peer being physically bullied/beaten, which suggests that the performative aspect of bullying may particularly incentivize boys and younger adolescents, two populations known for their greater incidence of overt aggression (cf. Felix & Green, 2010; Olweus 1993). The associations between adolescents' school track and a number of outcome measures align with findings of other studies on cyberbullying (e.g., Walrave & Heirman, 2011; Fest & Quandt, 2011), as well as with findings of studies on other 'deviant' uses of the mobile phone, such as on sexting (e.g., Vanden Abeele, Campbell, Eggermont & Roe, 2014).

A limitation of the current study concerns the measurement of peer group dynamics and bullying practices. Popularity was assessed with a self-report rather than a sociometric measure. Further research applying sociometric or social network analysis is advised to further validate our findings. The peer pressure measure included no immediate referral to the cyberbullying behaviors examined. As a result, we do not know if the peers of perpetrators are engaging in similar behaviors or not.

With respect to the bullying measures, although the questions asked emphasized the intentionality of the behavior (i.e. intentionally hurting the victim), they did not tap into how repetitive victims were bullied – which is generally regarded as a central feature of bullying (Olweus, 1993; 1999). However, several authors question the necessity of the repetition criterion in *cyberbullying*, as multiple views of the same content (by different people) can be considered as repeated harassment (Dooley, Pyzalski and Cross, 2009; Nocentini et.al, 2010).

Additionally, the measures do not allow to draw conclusions about the context of the bullying incidents (e.g., whether other peers were present when producing hurtful pictures/videos, ...), and offer no insight into their precise nature. The item measuring whether pictures or videos had been made of a peer being physically bullied/beaten, in particular, is problematic in that it is a double barreled item, and that physical bullying can take on many forms. Livingstone and Haddon (2008) refer to this limitation of quantitative approaches when stating that survey research oftentimes falls short in capturing the experiences of children. Hence, qualitative approaches to study the occurrence and social contexts of these severe bullying practices are advisable.

The sensitive nature of the questions may have increased the risk of response bias. Although such bias was minimized by having students complete the survey anonymously and under the supervision of a researcher (rather than a teacher), questions about cyberbullying behavior may still be underreported because respondents fear embarrassment or repercussions from third parties (cf. Tourangeau & Yan, 2007). Studies have also shown, however, that teenagers may deliberately over-report deviant behaviors because they wish to measure up to a perceived standard (e.g., Siegel, Aten & Roghmann, 1998), thereby potentially increasing their social desirability in the peer group. This can also not be ruled out.

It is clear that the technological landscape has changed considerably since the time these data were gathered. Today, most teenagers own a smartphone, and use this phone daily to access a plethora of mobile social media applications (Lenhart, 2015). These mobile social media applications oftentimes have integrated features for producing and sharing images (e.g., the embedded camera-buttons in Twitter, Facebook, Whatsapp); some even completely revolve around this (e.g., Instagram, Snapchat). As producing and sharing images in these applications can be realized with just a few screen taps, the boundaries between producing and sharing imagery may have become blurred for contemporary teenagers, making this

study's distinction between the two activities no longer relevant. In addition, the ease with which current generations of smartphones enable teenagers to produce and share imagery may have substantially lowered the threshold for cyberbullying. Given that previous research has identified impulsivity as a predictor of bullying (e.g., Olweus, 1994), this may be particularly problematic among teenagers who score high on this personality trait.

Finally, the current study focused rather narrowly on mobile phone use, thereby excluding other relevant devices and platforms. As it becomes increasingly difficult for researchers to incorporate the totality of all these into one study, there is a need for methodological thought on whether and how future researchers should capture the totality of cyberbullying practices in the lives of youth. Moreover, it is important to better contextualize these practices: how do they fit into youngsters' general (both positive and negative) online interactions with peers and teachers?, what precedes and follows these cyberbullying incidents?, and how do several actors interpret and act upon these situations? To answer these questions, qualitative, narrative research methods are necessary. Photovoice is an example of a participatory research technique that allows the communication of experience through participant-produced photographs. Interestingly, this technique might actually benefit from the same mobile phone technologies that are linked to the (cyber)bullying practices (see for instance: Yi-Frazier et al., 2015). This specific narrative approach might complement other narrative methods that have already proven to be successful in generating more in-depth insights in adolescents' cyberbullying experiences (and in developing effective interventions) (Bowler, Knobel and Mattern, 2015).

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