Social Media and Delinquent Behavior

How Online Friends May Encourage Offending

Damion Bunders

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Social Media and Delinquent Behavior:
How Online Friends May Encourage Offending

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Preface

Dear reader,

This thesis is the final assessment for my master study in Sociology: Contemporary Social Problems at Utrecht University. I did my research during a five months internship at the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR) in Amsterdam.

While social media and delinquent behavior are not the most obvious subjects to study, in hindsight it was a very logical path to take. During my bachelor study I wrote a paper on the relationship between delinquent behavior of adolescents and the behavior of their friends. It is a well-known phenomenon that the behavior of people is strongly related to that of their friends, and the same applies for delinquent behavior. For this paper I used scientific articles on social influence and selection mechanisms by Frank Weerman. In my master study I followed two criminology courses and a course on internet, social media and networks. NSCR offered me the unique opportunity to do research on the intersection of these subjects and also have Frank Weerman as my supervisor. As if it was written in the stars!

Because I have worked almost exclusively in groups during my bachelor and master studies, it was refreshing to now work alone most of the time. I also developed a great deal of respect for the high-quality datasets that I have used for previous papers. While writing my thesis mostly came naturally to me, as I enjoy writing, data collection was sometimes a real struggle. Most schools I contacted did not want to cooperate, so it was hard to reach enough students to participate in my research. Also the spring break and upcoming finals for many students were obstacles to my data collection. Still, I have learned a great deal by this process and am thankful for the schools and students that did cooperate. Moreover, I have gained experience in working with new types of analyses and even some statistical software that was new to me.

Of course I would like to thank some people who have helped me directly or just have been a great support. First and foremost, I want to thank my internship supervisor Frank Weerman, who inspired me, provided excellent feedback and also was very supportive. I also want to thank my thesis supervisor, Stijn Ruiter, for providing me with extra feedback and help – especially with some of the statistics. Furthermore, I want to thank Ho-Young Wisselink who has been a great help with the survey program Limesurvey and some other ICT issues. Finally, I want to thank my master coordinator Stefan Soeparman for his enthusiasm and dedication during the academic year, co-intern Jesse Bijma for the fun and support during our internship, fellow students Jaap van Slageren and Wieneke Golverdingen for their support, and of course my family for always being supportive of my academic efforts.

Damion Bunders
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Abstract

Previous research shows that adolescents who are exposed to delinquent peers and spend much time socializing with their peers are more likely to be involved in delinquent behavior. However, while a considerable part of our social world has moved online, little is known about how this translates to online peers on social media like Facebook and WhatsApp. Using a dataset of older adolescents, this study examines to what extent spending online time with peers and exposure to delinquent behavior on social media are related to adolescents' own delinquent behavior. The results show that adolescents who are more exposed to traditional (street) offenses and digital (cyber) offenses on social media are also more likely to engage in such behavior themselves, but not independent of what they see or hear from offline delinquent peers. Second, the findings show that spending more time on social media is related to increased traditional and digital offenses, even when controlled for time spent in offline unstructured socializing. Yet, additional analyses indicate that this only applies to males, but not to females. Implications for theory and policy are discussed.

Keywords

Social media, adolescents, delinquent behavior, online peers

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Content

1.   Introduction

The internet is a very different place than it was a decade ago. With the introduction of Web 2.0 the internet became more open, interactive and user-generated (O'Reilly, 2007). Indeed, it is now perhaps one of the most important contexts for social interaction (Beer & Burrows, 2007). In particular adolescents seem to be attracted by social media applications like Facebook and Twitter. In the Netherlands, practically all young people between 12 and 25 years old use at least one type of social media (Kloosterman & Van Beuningen, 2015). Moreover, one in five considers themselves addicted to social media. As social interaction between adolescents increasingly takes place online and may even replace face-to-face interaction in some cases, it is important to understand its consequences for psychosocial development (Subrahmanyam & Šmahel, 2011). Social media promise plenty of opportunities, such as self-expression, identity formation and intimacy. But there are also risks, such as cyberbullying, sexting and exposure to harmful content. Similar concerns have been raised in relation to other media types. For example, research shows that playing violent videogames is related to more aggressive behavior (Anderson & Bushman, 2001). Likewise, researchers have wondered what online interaction through social media means for delinquent behavior among adolescents (Mikami, Szwedo, Allen, Evans & Hare, 2010; Warr, 2002; Weerman, Bernasco, Bruinsma & Pauwels, 2015).

It is well-known from previous research that having delinquent peers and spending much time socializing with peers are related to increased delinquent behavior (Warr, 2002). Whether this is also the case for online peers on social media, however, is still largely unknown. There is only a handful of studies that did look at the meaning of online peers for delinquent behavior. Some researchers focused on the relationship between spending online time with peers and delinquent behavior (Meldrum & Clark, 2015; Weerman et al., 2015). Just like hanging around on the street or during nightlife, online interaction is typically unstructured and without supervision. Nonetheless, it is still unclear whether online time spent with peers has any unique effects on delinquent behavior, or whether there is substantial overlap with the effects of offline time spent with peers.

Other studies focused on the relationship between online exposure to delinquent peers on social media and adolescents' own delinquent behavior (Huang et al., 2014; McCuddy & Vogel, 2015a/b). This type of research is in line with previous studies on how certain images or information from online and more traditional media sources may promote delinquent behavior by influencing norms and imitation of behavior (see Anderson & Bushman, 2001; Hinduja & Ingram, 2009; Miller & Morris, 2014; Ybarra et al., 2008). Still, it is also unclear whether online

exposure to delinquent behavior has any unique effects on adolescents' own delinquent behavior, or whether there is substantial overlap with the effects of offline exposure to delinquent peers.

Policymakers and politicians in the Netherlands acknowledge both the opportunities and risks of social media. In 2008 the government initiated a digital literacy program ('*mediawijsheid*') that aims for better education and parenting in digital media (Ministry of Education, Culture and Science, 2015). With this approach, adolescents should become more aware to both the positive and negative sides of social media. In 2013 a parliamentary inquiry was conducted into the 'Project X Haren riots' (Cohen, Brink, Adang, Dijk & Boeschoten, 2013). These riots started from a birthday party that was accidently announced as a public event on Facebook. The party was canceled, but still many young people were mobilized. Eventually, it got out of control and the small town of Haren was severely vandalized. At this moment, there is much attention for online radicalization of young Muslims. Radical social media groups offer the opportunity to radicalize from one's bedroom, so to speak (Bermingham, Conway, McInerney, O'Hare & Smeaton, 2009). A dystopian view on social media should be avoided, but these examples clearly illustrate the need for better knowledge on social media influences. Van der Hof and Koops (2011) identified a policy dilemma: on the one hand adolescents should be protected against online risks, but on the other hand they should not lose their online freedoms. Particularly because adolescence is a phase of life in which individuals become more independent from their parents. Nevertheless, regulation measures on adolescents' internet usage tend to become more repressive (Van der Hof, Van den Berg & Schermer, 2014).

The current study employs a unique dataset of Dutch adolescents that was specifically collected to answer the following research question: *To what extent are spending online time with peers and exposure to delinquent behavior on social media related to adolescents' own delinquent behavior – independent of offline peer processes?* By taking into account (online and offline) context specificity, it becomes possible to disentangle influence, selection and situational explanations at least to some extent (Beier, 2014). Data come from an online survey that considers social media behavior, self-reported traditional and digital delinquency, exposure to online/offline peer behaviors, and a set of control variables. In addition, semi-structured interviews were held to get more insight into respondents' perceptions of social media, their norms towards posting on social media, and what they consider safe social media usage. Quantitative and qualitative methods are complementary in this research, with the online survey mainly used to answer the central research question and the interviews to inform policy implications.

2.   Theory and Literature Review

2.1   *Peers and Delinquent Behavior*

There is a rich history of criminological research on peers and delinquent behavior (see Akers, Krohn, Lanza-Kaduce & Radosevich, 1979; Haynie, 2001/2002; Sutherland, 1939; Warr, 2002). Having delinquent peers is one of the strongest predictors of delinquent behavior among adolescents (Warr, 2002), but also spending time with peers in general is related to delinquent behavior – in particular under unstructured, public and unsupervised conditions (Weerman et al., 2015). While these associations are well documented in the literature, there is an ongoing debate on the underlying mechanisms (Knecht, Snijders, Baerveldt, Steglich & Raub, 2010; Osgood, Feinberg & Ragan, 2015; Weerman, 2011). Three perspectives can be distinguished.

Social influence scholars state that adolescents will become delinquent when they have many delinquent peers relative to non-delinquent peers (Sutherland, 1939; Akers et al., 1979). The most prominent influence theory is Sutherland's (1939) differential association theory. According to Sutherland, people commit offenses if their social network contains an excess of definitions favorable to delinquency over definitions unfavorable to delinquency. Differential association theory implicates that changes in friendship networks may result in more or less delinquent behavior. More recent is social learning theory (Akers et al., 1979). This theory emphasizes behavioral reinforcement, learning and imitation of delinquent behavior. Warr (2002) argues that group processes, such as peer pressure, fear of ridicule, loyalty, status and subculture, may also influence delinquent behavior among adolescents.

The social selection perspective takes a different approach. It states that delinquent adolescents select other delinquents as their friends, and conversely, that non-delinquent adolescents select other non-delinquents as their friends (Gottfredson & Hirschi, 1990; Hirschi, 1969). The underlying assumption is that (non-)delinquent adolescents continue to behave in the same way as they always did, and make friends that behave similarly. According to homophily theory (McPherson, Smith-Lovin & Cook, 2001), people prefer to become friends with others that are like them: "*birds of a feather flock together*". Gottfredson and Hirschi (1990) propose that a low level of self-control is the selection criterion on which delinquent adolescents make delinquent friends. Individuals with low self-control are more impulsive, risk-seeking and easily agitated, which often translates to more delinquent behavior. Because they enjoy similar (risky) activities, low self-control adolescents may prefer to become friends with similar peers. Low self-control adolescents may also 'end up' with similar peers because of socialization problems they experience (Gottfredson & Hirschi, 1990).

Scholars from the situational perspective state that similar situations or contexts, like the same school or similar leisure activities, cause adolescents and their peers to behave similarly delinquent (Feld, 1982). A micro-level adaptation of routine activity theory states that adolescents and their peers become delinquent when they spend much time in unstructured and unsupervised socializing (Osgood et al. 1996). Opportunity mechanisms like the availability of unstructured time, the presence of possible co-offenders and the lack of capable guardians would tempt adolescents into more delinquent behavior under such circumstances. According to the theory, it is the contextual situation that explains both their friendship and their delinquent behavior by increasing the opportunity for both. An example provides clarification. Students from school A are free to leave the school premises during lunch breaks, whereas students from school B are not. This makes it more likely that students from school A spend time hanging around on the street with their friends, which is a form of unstructured and unsupervised socializing. Therefore, it is expected that students from school A develop more delinquent behavior than students from school B.

In summary, all three perspectives suggest some relationship between peers and delinquent behavior (see Figure 1). Social influence explanations predict that adolescents become delinquent when they are exposed to the delinquent behavior of their peers. Social selection explanations assume that delinquent adolescents make delinquent friends, but that delinquent behavior itself is caused by other factors. And scholars from the situational perspective anticipate that spending time with peers under unstructured and unsupervised conditions explains the delinquent behavior of both adolescents and their peers. Empirical research suggests that all three perspectives hold some truth (Haynie & Osgood, 2005; Osgood, Feinberg & Ragan, 2015), but it may depend on the context or type of offending behavior which one is predominant (Baerveldt, Völker & Van Rossem, 2008). Moreover, the boundaries between the perspectives are not as clear as often assumed. For example, social selection may result in social influence when a group of delinquent friends commits a crime that they would not have committed individually (Warr, 2002).
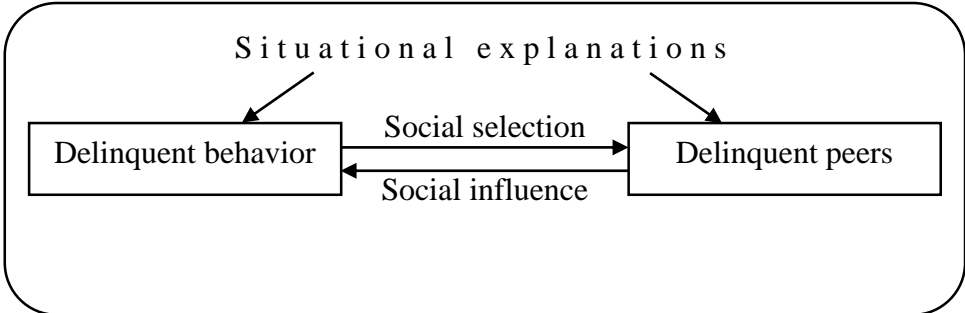

Figure 1. Visualization of the theoretical perspectives on peers and delinquent behavior.

2.2   Adolescents and Social Media

As already noted in the introduction, practically all adolescents in the Netherlands (98,6%) use at least one social media application (Kloosterman & Van Beuningen, 2015). The most popular social media in the Netherlands are Facebook and WhatsApp (Van der Veer, Sival & Van der Meer, 2016). Facebook currently counts over a billion daily active users worldwide (Facebook, 2015). But also newer applications, like Instagram and Snapchat, are very popular among young people. Social media can be used on a computer, but are also increasingly used on mobile devices like smartphones and tablets (Huang et al., 2014). Females and ethnic minorities seem to be more intensive users than males and natives. Twice as much of them spend more than five hours per day on social media (Kloosterman & Van Beuningen, 2015).

It is hard to define social media because of its many manifestations. This study adopts the formal definition of Kaplan and Haenlein (2010): "*Social Media are a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content*". Three parts of this definition should be highlighted.

First, social media are internet-based. This implies that the users of social media are virtually disembodied instead of physically present somewhere (Subrahmanyam & Šmahel, 2011), and also face no time restrictions. Therefore, adolescents can now communicate with their peers at any time and at any place (McCuddy & Vogel, 2015a). This potentially increases the amount of time adolescents spend socializing with their peers.

Second, social media build upon the foundations of Web 2.0. This means that social media typically have open access and are designed for interaction between its users. Online interaction has become less anonymous and more intimate because of social media as compared to older forms of online communication like message boards and chats (McCuddy & Vogel, 2015a). This explains why there is considerable overlap in online and offline networks. Most adolescents (91%) use social media to stay in touch with friends they also frequently see face-to-face (Subrahmanyam & Šmahel, 2011). On the other hand, social media allow for interaction with a much greater and more diverse number of contacts than in traditional offline interaction (McCuddy & Vogel, 2015b). For example, it is possible to make unique online friends or maintain contact with weaker ties (Ellison, Steinfield & Lampe, 2007). This explains why a substantial proportion of adolescents (82%) uses social media to stay in touch with friends they rarely or never see in person (Subrahmanyam & Šmahel, 2011). Because of this focus on social interaction, social media are an important context for psychosocial development during puberty.

Third, social media provide an environment for user generated content like status updates, videos and pictures for example. Subrahmanyam and Šmahel (2011) point out that adolescents are better described as co-constructors of social media, than as passive consumers. This particular aspect of social media creates additional opportunity for social influence mechanisms because online content may transfer norms and learn behavior beyond face-to-face interactions. Finding an audience to express oneself to is an important function of social media (Boyd, 2007). An influential experimental study has already shown that health behavior may spread through online social networks (Centola, 2010). Delinquent behavior may spread in a similar way.

2.3   Social Media, Online Peers and Delinquent Behavior

There is not much research on online peers and delinquent behavior. Most of what is available does not specifically focus on social media, but on the internet in general as a facilitator of cybercrime and cyber-victimization (Holt & Bossler, 2014). Hinduja and Ingram (2009) examined both online and offline peer influences on music piracy. Using a survey among university students, they find that students report more music piracy if they have online or offline friends that support this behavior or teach it to them. A very similar study found the same results using structural equation modelling with more items to measure social learning processes (Miller & Morris, 2014). Yet, these studies did not examine online peers on social media specifically, while the importance of social media has grown considerably over the past few years. Some scholars have suggested that recent drops in traditional delinquency, such as theft and violence, partly results from increased internet usage since today's adolescents may spend more time indoors on the internet than hanging around on the streets (Farrell, Tilley, Tseloni & Mailley, 2011). Nevertheless, spending more time on social media might be particularly related to digital delinquency (Meldrum & Clarke, 2015), like internet piracy and cyber-threats.

Social media may also facilitate traditional offline delinquent behavior. Some studies report that gang members intensively use social media to interact with other gang members. Pyrooz, Decker and Moule (2015) employed a survey among current-, former- and non-gang members to examine both general and deviant online behavior on social media. Interestingly, their study suggests that gang members might be using social media even more than non-gang members. In line with earlier research (Patton, Eschmann & Butler, 2013; Van den Broek, 2013), Pyrooz, Decker and Moule concluded that gang members display their offending behavior and street culture on social media to fulfil symbolic needs and gain status. Lim, Chan, Vadrevu and

Basnyat (2013) interviewed a group of gang-related delinquents about their social media behavior. One notable finding from their study is that social media may hinder adolescents in distancing themselves from their delinquent peers, since the latter are always present online. In this way, social media may contribute to persistence in delinquent behavior. Mikami et al. (2010) assessed whether adolescents' social media behavior at age 20-22 is related to their behavior and social skills at age 13-14. They found that hostile profile texts and posting photos of delinquent behavior on social media are related to a history of delinquent behavior, thereby indicating cross-situational continuity over time (Mikami et al., 2010). This suggests that problematic social media behavior might be regarded as an extension of earlier problems in life, such as delinquent behavior.

As adolescents are co-constructors of the social media environment (Subrahmanyam & Šmahel, 2011) and delinquency is widespread among them (Moffitt, 1993), it is not so surprising that researchers have found that adolescents also share content depicting delinquent behavior. Underwood, Rosen, More, Ehrenreich and Gentsch (2012) employed a text-analysis on the 'BlackBerry ping messages' (a precursor of WhatsApp) of 175 adolescents. As part of a larger research project, participants of their study got free BlackBerry phones and gave informed consent that their messages would be analyzed anonymously. On two full days, the researchers found that 7% of all messages contained swear words and 6,6% sexual words. Moreover, they found examples of drug deals, cyberbullying and references to other delinquent behavior in the messages.

A few studies suggest that exposure to such posts on social media is indeed related to increased problem behavior offline (Huang et al., 2014; McCuddy & Vogel, 2015a/b; Moreno, Christakis, Egan, Brockman & Becker, 2012). Moreno et al. (2012) used a survey to examine whether high school students' own alcohol consumption is influenced by exposure to social media pictures of drinking friends. They found that adolescents who are more exposed to such pictures also drink more alcohol themselves. Huang et al. (2014) confirmed this finding and were able to control for past drinking behavior, which excludes social selection explanations at least to some extent. While these studies mainly focused on substance use, McCuddy and Vogel (2015a/b) examined more serious offenses, like violence and theft. They employed a survey among university students to examine the relationship between exposure to eight types of traditional delinquency on social media and the same eight types of delinquent behavior as reported by respondents themselves. Their findings suggest that adolescents who are more exposed to delinquent peers on social media, also commit more offenses themselves. However,

digital delinquent behavior was not studied by McCuddy and Vogel. Moreover, they were unable to control for offline exposure to delinquent peers.

Other researchers focused on the relationship between spending online time with peers and traditional delinquency (Meldrum & Clarke, 2015; Weerman et al., 2015). Because online socializing with peers is typically unstructured and unsupervised, adolescents may be tempted to participate in delinquent behavior. As part of a larger research project on the situational aspects of delinquent behavior, Weerman et al. (2015) also examined online time spent with peers. They found that spending more online time with peers is correlated to more traditional delinquency. However, this effect disappeared when offline unstructured socializing was controlled for. Meldrum and Clarke (2015) did a very similar study. Yet, they found that online time spent with peers is independently related to increased traditional delinquency. It is thus still unclear whether online time spent with peers has any unique effects on delinquent behavior, or whether there is substantial overlap with the effects of offline time spent with peers. Moreover, both studies did not examine time spent on social media specifically nor did they study digital delinquency. While McCuddy and Vogel (2015a/b) do include time spent on social media specifically, their study lacks control for offline time spent in unstructured socializing. Therefore, the puzzle remains unsolved.

In short, the existing literature suggests that spending online time with peers and exposure to delinquent peers on social media may be related to increased delinquent behavior. Still, it is unclear whether these are unique effects or that there is substantial overlap with offline peer processes. The literature also suggests that online peers and social media behavior may be related to both traditional and digital delinquency. Much less is known, however, about the underlying mechanisms and about online peers on social media specifically.

2.4   Current Study

The current study contributes to the existing literature in several ways. First, as was advised by McCuddy and Vogel (2015a/b), this study examines both online and offline peer processes. This design makes it possible to check for unique effects from online peers on delinquent behavior. It also allows for distinguishing the three theoretical perspectives at least to some extent (Beier, 2014). Second, the current study examines both traditional and digital delinquent behavior. This is in line with recommendations of Meldrum and Clark (2015). Third, the scarce previous research almost exclusively took place in the United States (Huang et al., 2014; McCuddy & Vogel, 2015a/b; Meldrum & Clark, 2015). One exception is a Dutch study that

included online time spent with peers (Weerman et al., 2015). However, online exposure to delinquent peers has not been studied before in the Netherlands.

Based on the three theoretical perspectives and previous literature, several hypotheses can be formulated. Situational explanations predict that unstructured and unsupervised socializing with peers is related to delinquent behavior among adolescents. Social media likely increase the time spent in such socializing beyond hanging around in public places or in nightlife, as it allows adolescents to talk to their friends at any time and at any place. Therefore, it is expected that: *Adolescents who spend more online time with peers on social media, also commit more delinquent behavior – independent of offline time spent with peers in unstructured socializing (H1a).* Yet, the physical separation of online peers could make it harder to commit traditional street crimes together. Therefore, it is expected that: *Spending more online time with peers on social media will be more strongly related to digital delinquent behavior, than to traditional delinquent behavior (H1b).*

Social influence explanations predict that adolescents commit offenses when most of their friends approve such behavior or teach it to them. Social media may facilitate these processes because they are co-constructed by adolescents themselves, for example by posting pictures or messages. Moreover, adolescents may be exposed to delinquent behavior of weaker ties or unique online friends on social media – peers they rarely or never meet face-to-face. Therefore, it is expected that: *Adolescents who are more exposed to posts of delinquent behavior on social media, also commit more delinquent behavior themselves – independent of offline exposure to delinquent behavior of peers (H2a).* With regards to traditional and digital delinquency, it is expected that the approval and learning of specific behavior matters: *Exposure on social media to traditional delinquent behavior will be particularly related to traditional delinquency, whereas online exposure to digital delinquent behavior will be particularly related to digital delinquency (H2b).*

Social selection explanations predict that delinquent adolescents make delinquent friends, but that delinquency itself is caused by other factors, such as low self-control. It therefore assumes cross-situational continuity of problem behavior and a strong relationship between online and offline exposure to delinquent peers. This suggests that online social interaction with delinquent peers might be only an extension of offline associating with delinquent peers. Therefore, it is expected that: *Spending online time with peers and exposure to delinquent behavior on social media are related to adolescents' own delinquent behavior – but only if not controlled for offline time spent with peers in unstructured socializing and offline exposure to delinquent behavior (H3).*

3.   Methods

3.1   Data

A convenience sample of $N = 162$ adolescents was collected through an online survey during the spring of 2016. Participants were recruited via four Dutch secondary and tertiary schools[2]. A stratified selection of schools aimed for including a variety of different school levels and locations in the western part of the Netherlands (Randstad). The study further aimed to include students between approximately 16 and 20 years old, as offending is relatively common in this age group (Moffitt, 1993). The overall response rate of students in these four schools was 8.3%.

First, the principals of 84 secondary and tertiary schools in the Randstad-area were contacted and informed about participating in this research project. If they agreed to participate, information material for the parents or guardians of students was made available. This means that both schools and parents made an informed decision about whether students could participate in the study.

Participating students were approached through their school e-mail addresses. In this way, practically no personal information was needed to invite students and minimal effort was required from the schools. The invitation e-mail included information on both content and procedures of the study, emphasizing voluntary participation, anonymity and data security. The same information was repeated on the first page of the online survey. Moreover, before starting with the survey questions, respondents had to indicate that they understood this information and wanted to participate in the research. It took respondents on average fourteen minutes to finish the survey. As an incentive, they could win a smart camera and register for a summary of the research results. It is important to note that data was only collected through the survey and not through (unsolicited) observation of social media profiles. In this way, both harm-based and dignity-based approaches of privacy protection were respected (Zimmer, 2010). After selection on missings, $n = 132$ respondents were included in the analyses.

At the end of the online survey, respondents were informed about the possibility to participate in a semi-structured interview. Interested respondents could voluntarily leave their e-mail address and later received an invitation with information on both content and procedures of the interview. Additionally, some information material for parents or caretakers was included for those respondents who were invited for an interview. In total, three respondents participated in the interviews. It took on average 42 minutes to interview respondents. Consent for making

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[2] Approval for this research design was obtained from the Ethics Committee for Legal and Criminological Research (CERCO) at VU University Amsterdam. The survey questions, interview topics list and other research materials are available upon request.

an audio recording was asked in advance of the interview. The recording was only used for transcribing and later destroyed. Transcripts were coded to unravel main themes in the data, but only on an explorative basis. The interview topics focused on perceptions of social media, norms towards posting on social media and what is considered as safe social media usage.

3.2   Dependent Variables

Traditional delinquency. The first dependent variable was self-reported traditional delinquent behavior (street crime) in the past months since new-year. Since the survey was conducted in spring, this roughly corresponds to the past three months. Respondents were asked to self-report their offenses in four categories: violence (intentionally hurting someone), theft (from a person or store), vandalism (damaging street objects), and trespassing (entering a building or area without permission). The initial answering categories (zero times, one time, two to three times, four to five times, six or more times) were recoded to whether or not an offense was committed. The categories were then summed to create a variety scale for self-reported traditional delinquency. The advantage of using a variety scale over the number of offenses in each separate category is a higher reliability and validity of offending behavior (McCuddy & Vogel, 2015). The traditional delinquency categories that were used are relatively common in the selected age group (Van der Laan & Goudriaan, 2016) as compared to other types of delinquent behavior. 24.2% of respondents committed at least one traditional offense, of which most respondents entered a building or area without permission by its owners (18.2% trespassing, 9.8% violence, 6.8% vandalism and 6.1% theft).

   Digital delinquency. The second dependent variable was self-reported digital delinquent behavior (cybercrime) in the past months since new-year. A variety scale was compiled, similar to traditional delinquency, summing whether or not offenses were committed in four categories: cyberbullying/threats (posting mean or threatening messages to someone online), illegal downloading (internet piracy), cyber-vandalism (disrupting a website or app), and cyber-trespassing/hacking (of someone's online account or computer system). These categories were formulated to represent digital equivalents to the traditional delinquency scale. 49.2% of respondents committed at least one digital offense, of which most respondents had downloaded something illegally (42.4% illegal downloading, 12.9% cyber-trespassing/hacking, 9.8% cyberbullying/threats and 4.5% cyber-vandalism). The descriptive statistics of all variables are included in Table 1.

3.3   Independent Variables

Online time spent on social media. To measure online time spent with peers on social media, respondents were asked: 'How much time do you spend on social media on a typical day?'. Kloosterman and Van Beuningen (2015) used five time categories, ranging from less than one hour to over ten hours a day. Such a measurement likely results in very rough estimates. To increase measurement validity, the answering categories in this study included: (1) less than an hour per day, (2) one to two hours per day, (3) two to three hours per day, (4) three to four hours per day, (5) four to six hours per day, (6) six to eight hours per day, (7) more than eight hours per day. Respondents who answered "don't know" were set as missing on this variable. Figure 2 shows the distribution for hours per day spent on social media. This measurement is still imperfect, but comes closer to detailed (space-)time budget interviews than most earlier studies (Weerman et al., 2015). As a reference point, a previous question allowed respondents to indicate which types of social media they use. The top five most popular social media among respondents were: WhatsApp (97% of all respondents are users), Facebook (91%), YouTube (83%), Instagram (64%) and Snapchat (61%). The top three corresponded to earlier research on which social media people use in the Netherlands (Van der Veer et al., 2016). However, Instagram and Snapchat scored higher in the current study. It is likely that these platforms are especially attractive for adolescents as compared to the general population.
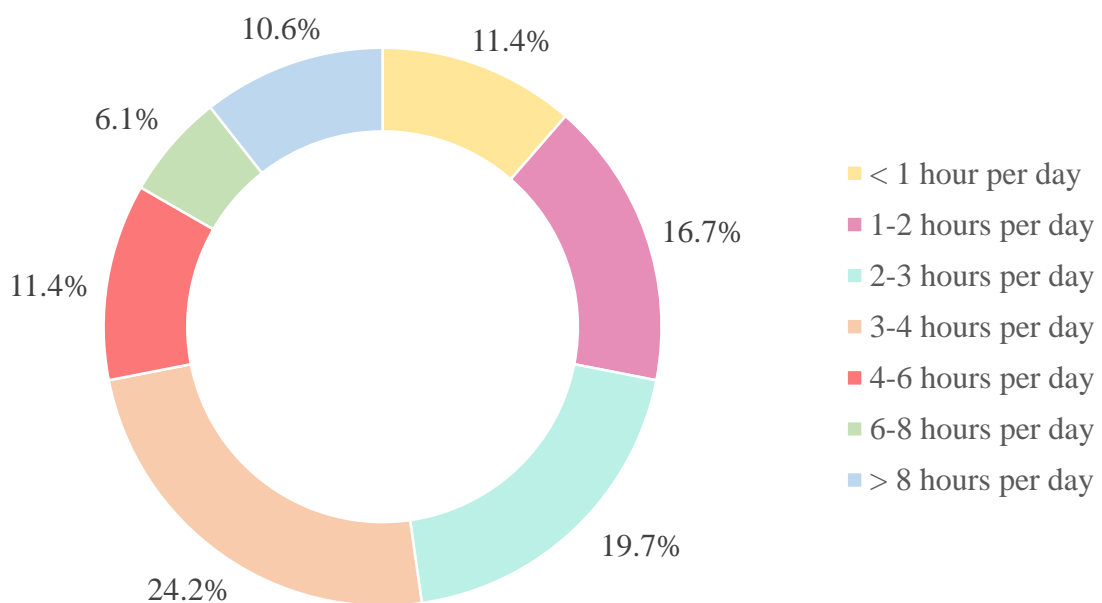

Figure 2. Distribution of hours per day spent on social media by respondents (*n* = 132).

Offline time spent in unstructured socializing. To measure face-to-face time spent in unstructured and unsupervised socializing, respondents were asked how many hours per day they hang around in public spaces (street, shopping center, park) and how many hours per week they participate in nightlife (bar, club, party). The answering categories were the same as for online time spent on social media. "Don't know" was again coded as missing. Nightlife participation was converted from hours per week to hours per day, after which the items were summed. The items were based on findings from previous research by Weerman et al. (2015). On average respondents spent approximately one to two hours per day in offline unstructured socializing ($M = 2.43$, $SD = 1.60$).

Online exposure to peer delinquency (traditional and digital). Respondents were asked how often they had seen or read on social media that their friends committed an offense in the same categories as for the self-reported delinquency scales. These were recoded to whether or not an offense was observed on social media. Then, two variety scales were compiled by summing the items for online exposure to delinquent peers on social media: one for traditional and one for digital delinquency. Online exposure to at least one offense by delinquent peers was 36.4% for traditional and 62.1% for digital delinquent behavior. In the survey these questions were asked before the self-reported measures to reduce the likelihood of projection effects (Young & Weerman, 2013). Projection effects are the tendency of people to project their own behavior onto their peers, thereby falsely assuming similarity. Another way projection effects were prevented, was that the question specifically asked what respondents saw on social media. For example, pictures and status updates of delinquent behavior by peers. Such specific observations are typically less susceptible to projecting own delinquent behavior onto peers than asking more directly about peer behavior (Young & Weerman, 2013).

Offline exposure to peer delinquency (traditional and digital). Respondents were asked how often they had seen offline friends commit an offense or heard about it directly from them. Similar to the measures for online exposure to peer delinquency, two variety scales were constructed: one for offline exposure to traditional delinquency and one for offline exposure to digital delinquency. As a reference point, a previous question indicated what is meant with face-to-face friends ('people you frequently see in person and hang out with') and asked how many friends respondents have ($M = 16.85$, $SD = 13.07$). Offline exposure to at least one offense by delinquent peers was 35.6% for traditional delinquency and 59.8% for digital delinquency.

3.4   Control variables

Three demographics were included as control variables: sex (male = 1), age (measured in years) and ethnicity (distinguishing a non-western background from native or other backgrounds). 27% of the respondents were males and 73% were females, which means that males were underrepresented in the dataset. On average, respondents were 18.6 years old. To construct a measure for ethnicity, a common definition was used (Statistics Netherlands, n.d.). Respondents with a Dutch native background were defined as having both parents born in the Netherlands (79% of all respondents). A non-western background was defined by having at least one parent born in Suriname, Antilles, Turkey, Morocco or another non-western country (18%). Respondents with at least one parent born in a western country or who indicated that they did not know where their parent was born were classified as having another ethnic background (3%). Because this last category was very small, the analyses will only differentiate between respondents with a non-western background and all others.

Finally, a measure for self-control was compiled from seven items using a mean score (α = .606). Of the initial ten items in the survey, factor and reliability analyses showed that these seven provided the best scale. Including a measure for self-control is important because previous research indicated a negative effect of self-control on delinquent behavior, which may also help explain possible selection effects as was discussed in the theory section. The items were based on Grasmick, Tittle, Bursik and Arneklev (1993) and Tangney, Baumeister & Boone (2004): I blurt out whatever is on my mind, even if it is inappropriate; I do many things on the spur of the moment; I have strong self-discipline; I am bad at resisting temptation; I lose my temper pretty easily; I always think through my alternatives before I act; I am good at working things out whenever I have a disagreement with someone. A basic five point Likert-scale was used for answering categories and some items were recoded so that a higher score related to more self-control. Respondents who answered don't know on an item were imputed using the Expectation-Maximization method based on their valid responses on the self-control items (Little's MCAR test was not significant, χ^2 = 85.291, p = .077).

Table 1. Descriptive Statistics *(n = 132)*.

	Mean	SD	Min	Max
Dependent variables				
Traditional delinquency	0.41	0.88	0	4
Digital delinquency	0.70	0.92	0	4
Independent variables				
Online time spent on social media	3.68	1.77	1	7
Offline time spent in unstructured socializing	2.43	1.60	1.14	8.00
Online exposure to traditional delinquency	0.63	1.07	0	4
Online exposure to digital delinquency	1.07	1.15	0	4
Offline exposure to traditional delinquency	0.70	1.17	0	4
Offline exposure to digital delinquency	1.00	1.11	0	4
Control variables				
Sex (male = 1)	0.27	—	0	1
Age	18.55	2.27	15	27
Ethnicity				
Dutch native background	0.79	—	0	1
Non-western background	0.18	—	0	1
Western background or unknown	0.03	—	0	1
Self-control	3.54	0.59	1.57	5.00

3.5   Analytic Strategy

Negative binomial regression was used, as the variances of the count-based delinquency scales were proportional to their mean. More specifically, most respondents reported that they did not commit any of the traditional or digital offenses. The dispersion parameter did change considerably between the models. However, while different distribution types from the Poisson family were tested, the results remained robust[3]. For sake of consistency between the models, only findings from negative binomial regression are reported. Other assumptions of the analyses were satisfied. Coefficients signify the expected log count of the dependent variables for a one-unit increase in the independent variables. Exponentiation of these coefficients creates the incident rate ratio (*IRR*), which will be discussed in the results section as it is easier to interpret than expected log counts. An *IRR* of greater than 1.00 means a positive effect and an *IRR* of smaller than 1.00 means a negative effect. Only respondents with valid values were included in the statistical analyses (*n* = 132). The regression models were built up stepwise. First, only including the predictors for online peer processes. Then, including the variables for offline peer processes as well. And finally, a complete model with all predictors included.

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[3] Tobit regression was also tested, but the model fit was better for negative binomial regression.

4. Results

4.1 Survey Findings

Table 2 shows a Kendall's tau-b correlation matrix for the dependent and independent variables. In contrast to expectations, there is no significant correlation between online time spent on social media and both traditional ($\tau = 0.092$, $p = .217$) and digital ($\tau = 0.086$, $p = .243$) self-reported delinquency. The other correlations are in line with the hypotheses. Online exposure to traditional delinquency has a strong positive correlation with self-reported traditional delinquency ($\tau = 0.520$, $p < .001$). Similarly, online exposure to digital delinquency has a strong positive correlation with self-reported digital delinquency ($\tau = 0.441$, $p < .001$). While the distributions of online and offline exposure to delinquent behavior were very similar, the correlations between these scales are not perfect. This means that, at least for a substantial part, different respondents are exposed to delinquent peers online than those that are exposed offline. Likewise, the correlation between online time spent on social media and offline time spent in unstructured socializing is far from perfect ($\tau = 0.163$, $p = .013$). This suggests that, while correlated, hanging around with peers online is a separate activity from hanging around offline.

Table 2. Kendall's tau-b correlation matrix ($n = 132$).

	1	2	3	4	5	6	7	8
1. Traditional delinquency	1.000	—	—	—	—	—	—	—
2. Digital delinquency	0.435***	1.000	—	—	—	—	—	—
3. Online time spent on social media	0.092	0.086	1.000	—	—	—	—	—
4. Offline time spent in unstructured socializing	0.252***	0.116	0.163*	1.000	—	—	—	—
5. Online exposure to traditional delinquency	0.520***	0.303***	0.147*	0.221**	1.000	—	—	—
6. Online exposure to digital delinquency	0.236**	0.441***	0.027	0.087	0.372***	1.000	—	—
7. Offline exposure to traditional delinquency	0.566***	0.368***	0.064	0.179*	0.487***	0.379***	1.000	—
8. Offline exposure to digital delinquency	0.444***	0.543***	0.069	0.063	0.269***	0.470***	0.484***	1.000

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 3 presents a summary of the negative binomial regression results for traditional delinquency. Model 1 shows something remarkable. In contrast to the correlation matrix, online time spent on social media now has a positive significant effect on self-reported traditional delinquency ($IRR = 1.257$, $p = .017$). This means that a one unit increase on the scale for online time spent on social media increases the expected count of traditional offenses by 26%. When offline time spent in unstructured socializing is controlled for, in Model 2, the effect remains significant and relatively stable ($IRR = 1.210$, $p = .012$). This is more in line with hypothesis H1a than H3, as the effect is convincingly independent of offline time spent in unstructured socializing. The difference between the results from the correlation matrix and the regression models may be explained by a control variable suppressing the relationship. An additional analysis with an interaction term (not included in Table 3) shows that, while controlling for offline time spent in unstructured socializing and the other control variables, there is only a significant positive effect on traditional delinquency when males spend more online time on social media ($IRR = 1.282$, $p = .031$). For females, there is no significant effect ($IRR = 1.118$, $p = .413$). This means that a one unit increase in online time spent on social media increases the expected count of traditional offenses by 28% for males, independent of offline time spent in unstructured socializing and the other control variables.

Model 3 indicates that online exposure to traditional delinquency has a positive significant effect on self-reported traditional delinquency ($IRR = 1.788$, $p < .001$). Model 4 shows that the effect of online exposure to traditional offenses loses significance when controlling for offline exposure to traditional delinquency ($IRR = 1.273$, $p = .055$). The 95% confidence interval for the IRR is between 0.995 and 1.630. This means that while there is no evidence found for a unique effect of online exposure to traditional delinquency on self-reported traditional offenses, the effect could be of great importance. Nonetheless, with the current data hypothesis H3 is preferred over H2a for traditional delinquent behavior.

Model 5 includes all variables. Remarkably, in this model only offline exposure to digital delinquency has a positive significant effect on self-reported traditional offenses ($IRR = 1.804$, $p = .006$). Online exposure to digital delinquency has a negative significant effect on self-reported traditional offenses ($IRR = 0.605$, $p = .019$). This is not in line with hypothesis H2b, which is therefore rejected. Time spent on social media still is a significant positive predictor of traditional delinquency in this model ($IRR = 1.223$, $p = .034$).

There is also one significant control variable. In all but one model, the expected count of traditional offenses is significantly higher for males than for females. Age, ethnicity and self-control are not significant predictors in any of the models.

Table 3. Summary of Negative Binomial Regression Models 1 to 5 for Traditional Delinquency ($n = 132$).

	Model 1		Model 2		Model 3		Model 4		Model 5	
	IRR	SE	IRR	SE	IRR	SE	IRR	SE	IRR	SE
Intercept	10.265	1.982	4.492	1.788	1.987	1.961	1.459	1.932	0.541	2.038
Independent variables										
Online time spent on social media	1.257*	0.096	1.210*	0.076	—	—	—	—	1.223*	0.095
Offline time spent in unstructured socializing	—	—	1.250**	0.073	—	—	—	—	1.111	0.093
Online exposure to TD	—	—	—	—	1.788***	0.092	1.273	0.126	1.427	0.201
Online exposure to DD	—	—	—	—	—	—	—	—	0.605*	0.215
Offline exposure to TD	—	—	—	—	—	—	1.587***	0.132	1.228	0.161
Offline exposure to DD	—	—	—	—	—	—	—	—	1.804**	0.214
Control Variables										
Sex (male)	4.636***	0.372	4.783***	0.339	2.207*	0.340	1.738	0.345	2.604*	0.393
Age	0.834	0.099	0.841	0.092	0.879	0.096	0.874	0.096	0.859	0.099
Ethnicity (Native/other = ref)										
Non-western background	1.141	0.406	0.764	0.388	0.947	0.368	0.979	0.354	0.883	0.364
Self-control	0.632	0.290	0.683	0.260	0.909	0.266	0.986	0.265	1.004	0.289
Log likelihood	-94.419		-91.307		-81.568		-75.961		-69.617	
χ^2 (*df*)	30.648 (5) ***		36.871 (6) ***		56.350 (5) ***		67.564 (6) ***		80.252 (10) ***	

Note. TD = traditional delinquency; DD = digital delinquency; *IRR* = incident rate ratio; *SE* = standard error; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

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Table 4 presents a summary of the negative binomial regression results for digital delinquency. Model 1 shows something similar as the first model of Table 3. In contrast to the correlation matrix, online time spent on social media now has a positive significant effect on self-reported digital delinquency ($IRR = 1.128$, $p = .040$). This means that a one unit increase in online time spent on social media increases the expected count of digital offenses by 13%. When offline time spent in unstructured socializing is controlled for, in Model 2, the effect remains significant and stable ($IRR = 1.129$, $p = .043$). Again, this is in line with hypothesis H1a and not with H3, as the effect is convincingly independent of offline time spent in unstructured socializing. When Models 2 in Table 3 and 4 are compared, spending time on social media surprisingly has a weaker effect on digital delinquency ($IRR = 1.129$) than on traditional delinquency ($IRR = 1.210$). Hypothesis H1b is therefore rejected. An additional analysis with an interaction term (not included in Table 4) shows that, while controlling for offline time spent in unstructured socializing and the other control variables, there is only a significant positive effect on digital delinquency when males spend more online time on social media ($IRR = 1.188$, $p = .035$). For females, there is no significant effect ($IRR = 1.069$, $p = .433$). This means that a one unit increase in online time spent on social media increases the expected count of digital offenses by 19% for males, independent of offline time spent in unstructured socializing and the other control variables.

Model 3 indicates that online exposure to digital delinquency has a positive significant effect on self-reported digital delinquency ($IRR = 1.510$, $p < .001$). However, Model 4 shows that the effect of online exposure to digital offenses loses significance when controlling for offline exposure to digital delinquency ($IRR = 1.106$, $p = .386$). This means that there is no evidence for a unique effect of online exposure to digital delinquency on self-reported digital offenses. Hypothesis H3 is therefore also preferred over H2a for digital delinquent behavior.

Model 5 includes all variables. Holding everything else constant, only offline exposure to digital delinquency has a positive significant effect on self-reported digital offenses ($IRR = 1.588$, $p = .001$).

There are also some significant control variables. In the first two models, the expected count of digital offenses is significantly higher for males than for females and significantly lower for respondents with higher self-control than respondents with lower self-control. While not significant, the direction is the same in the other models. Age and ethnicity are not significant predictors in any of the models.

Table 4. Summary of Negative Binomial Regression Models 1 to 5 for Digital Delinquency ($n = 132$).

	Model 1		Model 2		Model 3		Model 4		Model 5	
	IRR	SE	IRR	SE	IRR	SE	IRR	SE	IRR	SE
Intercept	6.248	1.161	6.407	1.194	4.921	1.274	4.460	1.237	3.088	1.309
Independent variables										
Online time spent on social media	1.128*	0.059	1.129*	0.060	—	—	—	—	1.110	0.068
Offline time spent in unstructured socializing	—	—	0.994	0.067	—	—	—	—	0.991	0.078
Online exposure to TD	—	—	—	—	—	—	—	—	0.912	0.126
Online exposure to DD	—	—	—	—	1.510***	0.081	1.106	0.116	1.137	0.127
Offline exposure to TD	—	—	—	—	—	—	—	—	0.999	0.120
Offline exposure to DD	—	—	—	—	—	—	1.539***	0.116	1.588**	0.145
Control Variables										
Sex (male)	2.076**	0.241	2.078**	0.241	1.203	0.247	1.219	0.244	1.441	0.260
Age	0.916	0.056	0.916	0.056	0.911	0.060	0.914	0.058	0.912	0.059
Ethnicity (Native/other = ref)										
Non-western background	1.225	0.262	1.235	0.275	1.104	0.266	0.987	0.263	1.020	0.273
Self-control	0.674*	0.183	0.672*	0.184	0.759	0.185	0.741	0.197	0.732	0.203
Log likelihood	-134.559		-134.555		-124.370		-116.622		-115.338	
χ^2 (*df*)	27.571 (5) ***		27.579 (6) ***		47.949 (5) ***		63.446 (6) ***		66.013 (10) ***	

Note. TD = traditional delinquency; DD = digital delinquency; *IRR* = incident rate ratio; *SE* = standard error; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

4.2   Interview Findings

While this study focuses on delinquent behavior, a dystopian approach to social media should be avoided. Spending time on social media can have many functions, of which several were also found in the interviews (see Table 5). It is also an activity respondents perceive as 'typically adolescent', something which parents often do not fully understand.

It is uhm.. mainly adults that keep an eye on kids because they spend too much time on their smartphone. So that is more negative (male aged 16).

Table 5. Functions of social media, as found in the interviews

Type of function	Illustrating quote
Social	Well, mostly keeping up with what my friends are doing and stuff (male aged 16).
Information	I am on a Facebook group about Shepherd dogs, because I have two German Shepherds. And there I have contact with others, who you can ask questions if there is something wrong with your dog (female aged 20).
Creative	But I think it is also a very positive thing. You can share new ideas with others way more easily (female aged 19).
Entertainment	I follow stuff like 'Best of Tumblr' and that sort of stuff. Like 9GAG, you then see lots of fun stuff, videos. I can really watch that for hours (female aged 20).
Economic	You also see that you can get jobs through Facebook. That is pretty easy (female aged 19).
Learning	In class we now suddenly have Kahoot! Do you know Kahoot? (female aged 20).
Emancipation	I have.. before I had my coming out, I was often searching the internet for websites. And there was 'Young & Out', which is a social media site on which people over 18 years old are removed. That is pretty safe (female aged 19).

Every social media platform has their own unwritten rules about what is normal to post. Respondents report that they sometimes hide certain social media behavior from their parents by 'posting for a specific audience'. This theme is in line with earlier research (Boyd, 2007).

And well, Tumblr is all kinds of stuff.. but it is good that my parents cannot see that haha (female aged 19).

To assure a safe social media environment, respondents believe that 'individual responsibility' must come first. Their views on social media regulation and digital literacy education will be presented in the implications section.

Yeah WhatsApp consists of messages, so it depends on yourself what you put on there and how you treat the other person (male aged 16).

5.   Discussion

Social media play a major role in the life of today's adolescents. While it is well known that adolescents commit more offenses when they have delinquent friends and spend much time hanging around with their friends in general, criminologists have wondered how this translates to the online world of social media (Mikami et al., 2010; Warr, 2002; Weerman et al., 2015). The current study examined to what extent online exposure to delinquent peers and time spent on social media are related to self-reported delinquency, independent of offline exposure to delinquent peers and time spent in unstructured socializing. First, the findings show that adolescents who are more exposed to traditional (street) offenses and digital (cyber) offenses on social media are also more likely to engage in such behavior themselves, but not independent of what they see or hear from offline delinquent peers. Second, the findings show that spending more time on social media is related to increased traditional and digital offenses, even when controlled for time spent in offline unstructured socializing. Yet, additional analyses indicate that this only applies to males, but not to females.

Contrary to expectations, spending time on social media was more strongly related to traditional delinquent behavior, than to digital offending. Another unexpected finding was that, when controlled for all forms of exposure to delinquent peers, offline exposure to digital delinquency is the strongest predictor of traditional offenses.

The findings can be understood by three theoretical perspectives on similarity in individual and peer offending behavior. First, the least evidence was found for social influence mechanisms. When adolescents are exposed to delinquent peers on social media, it may give them a signal that such behavior is okay (Sutherland, 1939) or teach them how to do it as well (Akers et al., 1979). Moreover, adolescents may be exposed to delinquent behavior of weaker ties or unique online friends on social media: peers they rarely or never meet face-to-face. Therefore, the expectation was that online exposure to delinquent peers explains self-reported delinquency *beyond* offline exposure to delinquent peers. However, in this study the effect of online exposure to delinquent peers on self-reported offending was not significantly independent from offline exposure to delinquent peers. Still, the findings did indicate a potential unique effect of online exposure to traditional delinquency on self-reported traditional offenses, but with the current data this is very uncertain and further research is needed. When all types of exposure to delinquent peers are taken into account, offline exposure to digital delinquency remains the only positive significant predictor of self-reported traditional offenses. This is not in line with the social influence perspective, as it would be expected that norm-socialization

and learning of specific delinquent behavior matters. Offline exposure to digital delinquency was also the strongest predictor of self-reported digital offenses. It might be the case that face-to-face exposure to digital offenses makes such an impression on adolescents that social influence mechanisms are stronger. However, right now this is only speculation and future research is needed to qualify this finding. Including more categories for digital delinquent behavior is advised, as item-specific crosstabs suggested that offline exposure to cyber-trespassing/hacking behavior contributed disproportionately to the effect. Other forms of delinquent or problematic behavior require attention as well. More specifically, further research is needed on online radicalization through social media (Bermingham et al., 2009).

Second, social selection mechanisms may explain why exposure to traditional and digital offenses on social media is related to increased self-reported offending, but only if not controlled for offline exposure to delinquent peers. Based on the current findings, exposure to delinquent peers on social media might thus be regarded as an extension of offline exposure to delinquent peers. Adolescents often use social media for interaction with friends they also frequently see face-to-face (Subrahmanyam & Šmahel, 2011). Moreover, they may prefer to find friends who are similar to themselves both online and offline. Digital delinquents may have a specific set of skills and interests, centered around computer technologies, which could explain why they make similar friends on social media as they do in the offline world. Next to such homophily-based explanations (McPherson, Smith-Lovin & Cook, 2001), social selection on similar levels of self-control could play a role here as well (Gottfredson & Hirschi, 1990).

Third, situational explanations may explain why spending more time on social media is related to increased traditional and digital offending, even when controlled for time spent in offline unstructured socializing. Spending time on social media is similar to spending time hanging around on the street or in nightlife. Both activities increase the time spent under unstructured and unsupervised conditions, which in turn is related to more delinquent behavior (Osgood et al. 1996). Social media allow for this type of socializing at any time and any place, especially with new mobile technologies like tablets and smartphones. These mobile technologies are important, as they may explain why spending more time on social media is more strongly related to traditional delinquency than to digital delinquency – which was contrary to expectations. Online peers have long been physically separated from each other, spending much time indoors behind a computer. Some scholars have even suggested that recent drops in street crime partly result from increased internet usage (Farell et al., 2011). However, with the introduction of smartphones this is no longer necessarily true. Unstructured socializing is now readily available in one's pocket, and the findings point out that specifically for males it

is a criminogenic factor. An explanation for this could be that excessive social media usage is more 'abnormal' for males. Earlier research pointed out that females spend twice as often more than five hours per day on social media than males (Kloosterman & Van Beuningen, 2015). Another explanation could be that male friendship groups hold more delinquent norms in general (Warr, 2002), which is harder to distance oneself from if the group is always available online (Lim et al., 2013). In this way, social media may contribute to persistence in delinquent behavior for males. Perhaps females also use social media in different ways than males. Therefore, a gendered approach to social media is essential for future research.

There are also some limitations to the current study that should be addressed. The response rate was low, resulting in lower statistical power and a higher likelihood of type II errors. In addition, the sample may not accurately reflect the selected population of Dutch adolescents. There was an overrepresentation of females as compared to males. Further, the selection of participating schools was limited to the urban western part of the Netherlands (Randstad) and not all school types could be included. This means that generalizations from this study should be made with caution. Another limitation is the cross-sectional nature of this study. While social influence, social selection and situational explanations could be distinguished to some extent, longitudinal research is necessary to give a more reliable answer on which of these mechanisms is predominant and under what conditions. Social selection assumes that delinquent adolescents will make delinquent friends, while social influence assumes that having delinquent friends will make one more delinquent as well. To take this into account more accurately, at least two measurement-points are necessary. Classroom-based data are recommended as well, so that the friends of respondents also participate in the research themselves. In this way, the tendency of respondents to project their own behavior onto their peers, and thereby falsely assuming similarity, could be avoided (Young & Weerman, 2013). Nevertheless, the measures of exposure to delinquent peers were already an advancement over previous studies that did not ask for very specific observations of peer behavior.

Despite these limitations, the current study adds to the scarce previous literature on social media and delinquent behavior. In the Netherlands it is even the first of its kind. While previous studies on this subject only examined traditional offenses (McCuddy & Vogel, 2015a/b; Meldrum & Clark, 2015; Weerman et al., 2015), the current study also included digital delinquency. Moreover, it attempts to differentiate between the underlying mechanisms of similarity in delinquent behavior among adolescents and their online peers. Therefore, a clearer understanding is now obtained on the risks of social media, without depicting adolescents as passive consumers nor approaching social media in a dystopian manner.

6.   Implications

6.1   Stakeholders in the Policy Field

Among policymakers, politicians and practitioners there is a debate between those who favor regulation of social media and those who think that education is more appropriate to counter the risks that are associated with social media. Some scholars note that regulation measures on adolescents' internet usage tend to become more repressive (Van der Hof, Van den Berg & Schermer, 2014). This is problematic because on the one hand adolescents should be protected against online risks, but on the other hand they should not lose their online freedoms and opportunities (Van der Hof & Koops, 2011). Particularly since adolescence is a phase of life in which individuals become more independent from their parents and learn from mistakes they make. It is therefore essential to avoid a dystopian approach to social media. Moreover, most adolescents are able to take 'individual responsibility' on social media.

> Well, hate posts.. that depends on the people involved I think. Because I am like, if someone is hating on you, you should click them away. That is the good thing about online, you can click people away (female aged 20).

Nonetheless, as the empirical part of this study has shown, not all adolescents are this responsible on social media. Some of them are offenders who share their delinquent behavior online, which may potentially influence others' behavior. Moreover, excessive social media usage was found to be a criminogenic factor for males. Parents are often unable to effectively control their children's online behavior (Van der Hof, Van den Berg & Schermer, 2014). While a lack of knowledge on the part of parents could be addressed by policy measures, adolescents may also actively hide their online activities by 'posting for a specific audience'.

> Yeah they don't post that sort of stuff on Facebook of course. Because if you post a photo with your pupils like this [opens eyes widely, as if on drugs], then that is a bit foolish. But you do see such things on Snapchat yes (female aged 19).

The policy goal is thus to guide adolescents into pro-social behavior on social media, without restricting their online freedoms and opportunities. The following sub-sections will describe current policies and advice on what organizational and practical measures are necessary to accomplish the policy goal. More specifically, advice will be given on self-regulation by social media companies and digital literacy education by schools.

6.2   Self-Regulation by Social Media Companies

Currently there are both public and industry efforts to regulate social media. For example, there are reporting centers for online problem behavior and harmful content that adolescents may encounter on social media (Ministry of Education, Culture and Science, 2015). These centers are part of an European Union (EU) program to increase online safety (Van Royen, Poels & Vandebosch, 2016). Industry self-regulation is also common for media providers in the Netherlands. For example, the Netherlands Institute for the Classification of Audiovisual Media (NICAM) and the Pan European Game Information (PEGI) try to prevent that minors are exposed to harmful content in audiovisual media and videogames respectively. However, there is no equivalent organization for social media because of the difficulties that obstruct such self-regulation. Most importantly, social media are not limited by borders. This poses an obstacle to national and local legal efforts. Therefore it is promising that the EU and industry players have made an agreement in 2009 to protect young social media users (Van Royen, Poels & Vandebosch, 2016). While this agreement is still in place, only a limited number of social media companies is involved, which makes implementation inconsistent between platforms. Moreover, social media are shaped by users themselves. This means that content on social media is created by consumers instead of by a producing company. Attempts to (automatically) block or filter harmful content from social media may be experienced as unwanted cyber-paternalism and loss of online freedoms. Nonetheless, the findings of this study indicate that user generated content on social media may be linked to delinquent behavior among adolescents. The regulation dilemma is thus still unsolved.

The first advice is to install a pan-European organization for the self-regulation of social media. The European Commission may provide an impetus to continue the discussion with social media companies from the earlier agreement of 2009. The advantage for the EU and its citizens is that such an organization could guarantee some standard safety measures across all social media platforms: one age limit, a universal reporting system for harmful content, privacy rules, terms of use, and policy rules for minors. A self-regulating organization is advantageous for social media companies as well, as it results in more legitimacy and lobbying power. The organization's structure could be modelled after PEGI and be partly funded by the EU.

The second advice is more practical. To decrease the display of delinquent behavior by adolescents, self-regulation by social media companies can be effective if implemented correctly. Not all regulatory measures are equally useful, however. For example, the interviews provided arguments against automatic filtering, which focused on privacy issues and feasibility.

Because else you get code words for everything, like they have in the drug trade.. (female aged 20).

Nonetheless, a user-based reporting system also has downsides. More specifically, it requires initiative from users to report incidents of problematic online behavior, which most likely will not happen in many cases.

But I did not report it to the website [sexting incident]. Like this guy did this and uhm.. block him off the site (female aged 19).

Therefore, a more targeted approach is necessary. A randomized controlled intervention study on the display of substance use and sexual references on social media profiles of at-risk adolescents showed that giving them a targeted notification could reduce the number of references posted after the intervention (Moreno et al., 2009). Such a notification informs the user of the potentially negative consequences of posting about certain behavior. It also signals the user that his or her social media posts may be seen by unintended eyes, which could lead to reputation damage. Finding these at-risk adolescents on social media may be possible by a combination of automatic procedures and human moderators. An effective notification system should not only focus on potentially negative consequences of social media behavior, but also offer pro-social alternatives. This relates to the concept of nudging (Thaler & Sunstein, 2008), which involves an indirect approach to tempt people to exhibit certain 'good behavior'. For example, a notification could first explain why posting about delinquent behavior is not such a good idea as it may stick around online, potentially influence others and leave a bad impression. Then it could also suggest an alternative pro-social behavior, like going to a nearby event that online friends of the user will also attend. Similarly, a notification could pop up for users who spend too many hours per day on social media.

6.3   Digital Literacy Education by Schools

The current program for digital literacy education in primary and secondary schools is promising. However, it is based on the voluntary participation of schools, which makes implementation inconsistent. Many children and adolescents are not reached despite efforts from semi-public organizations. Recent research points out that most schools in the Netherlands teach their students basic ICT skills on how to work with computers and the internet – so called '*informatica*' (Thijs, Fisser & Van der Hoeven, 2014). However, only a limited number of schools also teach critical thinking on the meaning of new online technologies for society and

the opportunities and risks of social media – '*mediawijsheid*'. This inconsistency between schools can be explained by the institutional context. The Netherlands has a long history of educational freedom, which means that the national government is restrained in interfering with teaching methods and the curriculum of schools. There is a standard curriculum and central exam that is determined by the national government, but until very recently there was no plan to include digital literacy (Platform Onderwijs2032, 2016). While there is much (justified) criticism on policy changes in the field of education, it appears that there is political consensus on the importance of digital literacy (Ministry of Education, Culture and Science, 2015). This illustrates that there may be a policy window to overcome the inconsistencies between schools.

The first advice is therefore quite obvious: digital literacy needs to be included into the standard curriculum for primary and secondary schools. Nonetheless, the implementation of this advice is hard and a full course may not be possible on the short-term. Teachers are already overworked and most of them are not trained to give lessons in digital literacy (Thijs, Fisser & Van der Hoeven, 2014). It would take a major investment to develop a good quality, standardized digital literacy course and equip teachers with the necessary skills to teach their students. However, a full course may also not be necessary for all students and should definitely not be implemented with haste. More research is first needed to develop a digital literacy course that fits for all students.

> Uhm.. yes some information meetings on school on how to use social media the right way. Something like that. […] Well something like a course, if you are in the first year, that will be taught one day per week for seven weeks or something. But not a whole year (male aged 16).

The second advice is, again, more practical. A digital literacy course should maintain balance in attention for the positive opportunities and the risks of social media. Similar to the targeted notification system, nudging can play a role here as well. By offering pro-social alternatives, adolescents may be directed towards better online behavior. Raising awareness for the seriousness of digital delinquency is important, for example, but the positive opportunities of social media need to be central to the course. In this way, the course may put offenders back on the right track and still be attractive to students who do not commit any offenses.

> Uhmm.. experiences from others I think. And, it may sound like I am really old haha.. but until a few months back I did not know you could link WhatsApp to your laptop. […] Yes, to stay updated with new things. I think that is very important (female aged 20).

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Criminological research has shown repeatedly that adolescents who are exposed to delinquent friends and spend much time socializing with their friends commit more offenses themselves. Nonetheless, little is known on how this translates to online friends on social media while social interaction between adolescents increasingly takes place online and may even replace face-to-face interaction in some cases. Moreover, do delinquent adolescents select other delinquents as their online friends or are adolescents influenced by their online delinquent friends? Is spending online time on social media a criminogenic factor on its own? How do we make social media safer for adolescents without restricting their online freedoms and opportunities?

Damion Bunders is a sociologist who is concerned with theory, empirical research and practice. His goal is to contribute to scientific knowledge and possible solutions in the field of urban and cyber space. This study was carried out for his master thesis Contemporary Social Problems.