Adolescents' privacy on Social Network Sites: An investigation of predictors of privacy protection behavior

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ABSTRACT

A widespread assumption is that all young people in contemporary society tend to 'overshare' sensitive personal information on Social Network Sites (SNS). Although many studies are investigating drivers for personal information disclosure, research that is paying attention to privacy protection behavior remains relatively scarce. To fill this gap this study investigates what factors predict the types of personal information adolescents disclose and how they apply privacy settings on their SNS profile. We conducted a large-scale survey with a sample of 1118 adolescents from Flanders (Belgium's northern Dutch-speaking region), ranging in age from 11 to 18 years. Based on an exploratory factor analysis we are able to make a distinction between two types of personal information that young people disclose on a SNS, namely profile data (e.g. demographic or lifestyle data) and contact data (e.g. home address or phone number). Adolescents are more willing to disclose profile than contact data and are applying more lenient privacy settings to these profile data. Furthermore, regression analysis results show that privacy concerns as well as parental mediation styles appear to be the most important predictors.

Key words: Adolescents; Privacy; Social Network Sites; Facebook; Parental Mediation; Privacy Concerns

INTRODUCTION

Social Network Sites (SNS) have emerged as a preferred communication resource for adolescents (Ofcom, 2008). SNS offer adolescents opportunities to share personal information and get at the same time regular updates on their friends' lives. This overt sharing of personal information blurs the boundaries between private and public communication, raising questions about how adolescents handle their online privacy (Bazarova, 2012).

The socio-technical affordances of SNS incite users to disclose substantial amounts of personal information (Thelwall, 2009). Although access to this information can be restricted to a small subset of the friend network, it is often shared with the entire network (Gilbert & Karahalios, 2009). This overt sharing of personal information challenges intimate interpretations of self-disclosure, which is restricted to close, trusted contacts (Derlega & Chaikin, 1977).

In the context of this research, the concept of 'information privacy' is imperative. Westin (1967, p. 7) adopts a definition of information privacy as an individual's control over personal information. He defines privacy as "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about themselves is communicated to others." SNS users have two possibilities to control the extent to which personal information is disclosed to others. First, users can limit the types of personal information they disclose on SNS. Second, users can manage privacy settings on SNS to determine who has access to this information, ranging from a broad audience of all Internet users to a small group of users (e.g. only themselves, friends, friends of friends, etc.). In this paper we refer to these two possibilities as privacy protection behavior.

Although it is widely assumed that young people tend to 'overshare' sensitive personal information on SNS, a recent trend is that adolescents are more selective and discrete when it

comes to what personal information they disclose on SNS and to whom (Patchin & Hinduja, 2010). Nevertheless, attention to the actual predictors of this privacy protection behavior remains scarce. Consequently, the aim of the present study is to investigate what factors predict the types of personal information adolescents disclose and how they apply privacy settings on their SNS profile.

LITERATURE REVIEW

Adolescents' disclosure of personal information on SNS

SNS incite sharing and disclosing personal information, as to create 'oneself into being' online (Sundén, 2003). Earlier studies reveal that most adolescents enter full name, hometown, facial pictures and e-mail addresses in their profiles on SNS (Strater & Lipford, 2008; Taraszow, Aristodemou, Shitta, Laouris, & Arsoy, 2010). However, young people disclose less personal information through which they can be contacted, i.e. their contact information. Hence, adolescents are more willing to disclose profile information, such as demographic, lifestyle and other no-identifiable information.

In this respect, privacy protection behavior can be seen as a process of identity management (Van Zoonen, 2013), as SNS users decide to disclose or hide different types of personal information in order to manage their identity or the way they want to be seen by others.

Most adolescents are aware of the potential risks related to the disclosure of personal information, however, they do not always act accordingly (Livingstone, 2008). Adolescents, for example, tend to accept complete strangers or people known only casually as their friends on SNS (Debatin, Lovejoy, Horn, & Hughes, 2009; Livingstone, 2008). Accordingly, disclosing

profile and contact information on SNS to friends is just as risky as it is if they do not protect this information. This phenomenon is labeled as the 'privacy paradox' (Staples, 2006). Hence, we wonder which factors could explain and predict adolescents' privacy protection behavior.

Privacy concerns

Previous research to the disclosure of personal information on SNS indicated a negative relation between privacy concerns and personal data disclosure on these sites (De Souza & Dick, 2009; Debatin et al., 2009). Moreover, Utz & Krâmer (2009) found a relationship between more privacy concerns and a stricter privacy protection behavior on social SNS. Based on these findings, this study hypothesized that teenagers with more privacy concerns would be less likely to disclose profile data (H1a) and contact data (H1b).

Frequency of use

Within the context of SNS, studies have demonstrated that the more people use SNS the more they are inclined to disclose personal information (Trepte & Reinecke, 2011; Valkenburg & Peter, 2009). This process is stimulated by the social rewards, in the form of feedback or other actions, users get for disclosing personal data. In addition, they do not only disclose personal data because of the social rewards, but also to meet new people (e.g. Ellison, Steinfield, & Lampe, 2011). We therefore hypothesize that the frequency of use is positively related to the level of personal data disclosure (profile data H2a, contact data H2b).

Internet literacy

Livingstone (2008) and Park (2011) points to function of Internet or digital literacy in privacy protection on SNS. Young people struggle to fit their privacy concerns within the

affordances of SNS (Livingstone, 2008). Elaborating an online identity that supports the self by disclosing a lot of personal information benefits from presenting a managed and stylized display of identity as lifestyle, but it risks violation of privacy by others. Advanced users of SNS are expected to have the competencies required to change the privacy settings on SNS in such a way that they can construct an identity and maintain social relations with experiencing fewer risks and more opportunities. Therefore, we expect that a high level of Internet literacy incline adolescents to disclose profile information that is needed for their identity construction, but not to disclose contact data (profile data H3a, contact data H3b).

Parenting

Various studies have examined the ways in which parents could play a role in online risk coping behavior by adolescents (e.g. Lee & Chae, 2007; Livingstone & Helsper, 2008; Lobe, Segers, & Tsaliki, 2009). In order to get a better notion of the roles that parents take on and the meditational strategies that parents use to manage their children's SNS use, we elaborate on the concept of parenting styles. Based on the conceptualization of Baumrind (1966, 1967) and the further elaboration of this theory by Maccoby and Martin (1983), the present study make a distinction between four parenting styles for managing young people's privacy protection behavior on SNS. (1) the *authoritarian parenting style* (abbreviated to ANPS) includes parents who demand absolute obedience from their children; (2) the *authoritative parenting style* (AVPS) is reflected in parents who simultaneously set forward rules, but who are also open for discussing; (3) the *permissive parenting style* (PPS) concerns parents who do not put forward explicit rules, but rather discuss what they and their children want; and (4) the *laissez-faire* (or neglectful) *parenting style* (LFS) is reflected in parents who almost never intervene in their children behavior. Previous Internet studies yielded that discussion between the parent and the

child enhances privacy concerns (Moscardelli & Divine, 2007), while rules did not have significant effects (S. H. Youn, 2008). Since various studies showed that high level of privacy concerns lead to a better privacy protection behavior, we expect that adolescents whose parents have a style that is characterized by the use of discussion, namely PPS and AVPS, are less likely to disclose personal data (respectively profile data H4a and contact data H4b; profile data H5a and contact data H5b). While we hypothesize that adolescents whose parents have an ANPS and LFS are more likely to disclose personal information on SNS (respectively profile data H6a and contact data H6b; profile data H7a and contact data H7b).

METHODOLOGY

Sampling procedure

For the present study we conducted an online survey to investigate adolescents' media behavior in 12 Flemish (Belgium's northern Dutch-speaking region) secondary schools. These schools, selected to reflect the diversity in education types, were willing to collaborate as they enabled their pupils filling out an online survey in the classroom. For investigating adolescents' privacy protection behavior on SNS, we focus primarily on Facebook. While it is unlikely that Facebook will continuously be the main destination SNS for young people, we use this site because its mass popularity offers insights into privacy protection behavior on other SNS as well. Hence, we selected only the Facebook users for this research. If the adolescents had a Facebook profile they were invited to participate to the questions about privacy issues. In total 1118 Flemish adolescents answered these questions. Before the questions on privacy issues, the respondents were asked to provide socio-demographic details. The sample consists of 573 boys (51,30%) and 544 girls (48,70%) with an average age of 15,15 (SDage: 1,98).

Measures

Disclosure of personal data is examined by providing adolescents with a list of 12 specific pieces of personal information. The respondents were subsequently asked whether and to whom they had divulged each piece of information on their profiles. Exploratory factor analysis (Maximum likelihood estimation with varimax rotation) revealed that two factors could be distinguished with an eigenvalue greater than one. The pieces of personal information that loaded high on the first factor were gender, age, relationship status, links, photos and movies. This factor accounted for 40,47% of the variance and is labeled *profile data* ($\alpha = 0,83$). The second factor accounted for 14,50% of the variance and was labeled *contact data ($\alpha = 0,67$)*. The pieces of personal data that loaded highest on this factor were: home address, mobile phone number, e-mail address and the location where you are at that moment. For further analysis, raw scores were aggregated, with higher values indicating a higher inclination to disclose a specific type of information to a broad audience.

Privacy concerns were measured with two statements, based on Bauwens et al. (2009), namely: 'I am concerned about what Facebook does with my personal information' and 'I don't like the idea that strangers would see my personal information on Facebook'. Responses were measured using a five-point Likert scale ranging from 1 ('totally disagree') to 5 ('totally agree'). Raw scores were summed, with higher values indicating a higher level of privacy concerns. The mean of adolescents' privacy concerns is 4,16 (SDprivacy: 0,86) on a 5-point scale.

Frequency of use was measured by asking respondents how often they connect to Facebook. Responses were measured using a five-point scale ranging from 'once a month or less' to 'several times a day'. The vast majority of the adolescents (83,70%) connects to

Facebook on a daily basis, 13,80% on a weekly basis and only a very small percentage of them

(3,50%) connects to Facebook on a monthly basis.

Internet literacy was measured by asking the respondents how well they judge

themselves in performing certain Facebook activities, such as adapting privacy settings or

creating friend lists. Responses were measured using a five-point Likert scale ranging from 1

('not skilled at all') to 5 ('highly skilled'). Factor analysis revealed a single factor, consisting of

nine items, that was named *Internet literacy* ($\alpha = 0,92$). Raw scores were summed, with higher

values indicating a higher level of Internet literacy. The respondents' average score on their self-

assessment of Internet literacy is 2,84 (SDskills: 1,06) on a 5-point scale.

Parental mediation styles was measured by asking adolescents if they experience rules

about the duration that they may use Facebook, the location where they may use Facebook, the

devices on which they may use Facebook and the content that they may share on Facebook.

Responses were measured using 'yes' or 'no' answers. We also asked the adolescents how often

they discuss their Facebook behavior with their parents by using a five-point scale ranging from

'once a month or less' to 'several times a day'. In order to grasp the heterogeneity in the styles

parents take on to intervene in their children's Facebook use, we performed a latent class

analysis (LCA) on these parental mediation variables. This statistical technique helps us to

discover the unobserved subgroups within a given set of categorical variables (Vermunt &

Magidson, 2006). A four-cluster model yields a good fit (L2(1317) = 14,94, p =1). The first

cluster is made up by teenagers whose parents take on a permissive parenting style (PPS) (Mage

= 15,51, SD = 2,03). The second cluster comprises teenagers whose parents have a laissez-faire

parenting style (LFS) (Mage = 15,13, SD = 2,04). The third cluster consists of teenagers with

authoritative parents (AVPS) (Mage = 14,38, SD = 1,83). Finally, the fourth cluster exists out of

adolescents whose parents have an authoritarian parenting style (ANPS) (Mage = 14,24, SD = 1,65). The PPS is the parenting style that is most experienced by adolescents for intervention in their Facebook behavior (37,40%). Also the LFS (35,40%) and AVPS (17,30%) are common for a quite substantial group of young people. The parenting style that is less experienced by adolescents for intervention in their Facebook behavior is the ANPS (9,80%).

RESULTS

Disclosure of personal data and the adaptation of privacy settings

For examining which types of personal information adolescents disclose on Facebook and how they apply their privacy settings, we conducted descriptive statistics. Table 1 shows to what extent adolescents disclose profile and contact data and their application of privacy settings on Facebook. The table displays a sharp contrast in adolescents' disclosure of profile and contact data. A first remarkable finding is that the majority of teenagers (79,50%) do not share contact data. The adolescents who do share contact data on Facebook do limit the disclosure to their friends. Only a minority of adolescents (3,60%) share contact data to several people they known only casually or known not at all (e.g. friends of friends or everyone). Table 1 also indicates that a majority of the adolescents discloses profile information and are applying more lenient privacy settings to this kind of data. Although half of the adolescents disclose profile data to their friends (53,20%), results indicate that still a lot of them (26,30%) disclose profile data to people they not or hardly know.

Table 1 Privacy settings for profile and contact data

	Profile data	Contact data
Not shared	20,50%	79,50%
Shared with friends	53,20%	16,90%
Shared with Friends of friends	20,00%	2,00%
Shared with Everyone	6,30%	1,60%

Even though, the majority of adolescents share their profile and contact data only with friends, they tend to accept complete strangers as their friends on Facebook, such as organizations or companies (34,90%) and friends of friends they have never met (27,30%). A vast majority of young people adds as a friend on Facebook mainly people they know, such as fellow students (90,40%), good friends (96,70%), family members (84,00%) and brothers/sisters (82,90%). Half of the adolescents also add friends from the past (43,30%) and parents (56,40%) as a friend on Facebook.

Predicting factors of adolescents' privacy protection behavior

In order to test which factors from the literature study can serve as a predictor for adolescents' privacy protection behavior on Facebook, two multiple hierarchical regressions were performed. Table 2 provides an overview of the estimated regression coefficients. The included variables explain 21,30% of the variance in adolescents' disclosure of profile data and 17,20% of the variance in their share of contact data on Facebook.

Our analysis found that the main predictors for the first model on profile data are adolescents' privacy concerns and their level of Internet literacy. This result offers support of H1a: The higher adolescents' privacy concerns, the less they disclose profile data on their Facebook page to

everyone. Furthermore, Internet literacy was positively related to the disclosure of profile data. Adolescents who have a higher level of Internet literacy to deal with Facebook are more inclined to disclose profile data on Facebook. This finding serves as a confirmation for H3a. Also significant, but less strong predictors of adolescents' disclosure of profile data are parenting styles. Table 2 shows that adolescents with AVPS parents are less likely than LFS adolescents to disclose profile data on Facebook, which is a support for H4a. Concerning the other parenting styles, we found no significant differences between the adolescents. Consequently H5a, H6a and H7a are not confirmed. Frequency of use is not a significant predictor of the disclosure of profile data, hence, H2a is not supported.

Table 2 shows that three of these factors, namely privacy concerns, parenting styles and frequency of use, retain their importance in explaining adolescents' disclosure of contact data. Young people who have more privacy concerns are also less likely to disclose contact data on Facebook and adolescents who have a high frequency of Facebook use are more inclined to disclose this kind of data. This serves as a confirmation for H1b and H2b. In contrast with profile data, we found that the adolescents whose parents take on a PPS are less likely than the LFS adolescents to disclose contact data on Facebook. H5b is confirmed. We found no significant relationship between AVPS, ANPS and LFS and the disclosure of contact information on Facebook, consequently H4b, H6b and H7b are rejected. The analyses further identify gender and age as important predictors of the disclosure of contact data on Facebook. Female and old adolescents proved less inclined than males and young adolescents to disclose contact information on Facebook. Unexpectedly, however, the relation between Internet literacy and the disclosure of contact data by adolescents on Facebook was not significant. This result indicates that H3b should be rejected.

Table 2 Hierarchical multiple regression predicting the disclosure of profile and contact data

	Disclosure of profile data		
	B	SE	β
Intercept	2,61***	0,23	
Gender (1)	-0,04	0,04	-0,03
Age	0,01	0,01	0,03
Frequency of Facebook use	0,05	0,03	0,06
Privacy concerns	-0,31***	0,03	-0,37***
Parental mediation			
PPS	-0,03	0,05	-0,02
AVPS	-0,14*	0,06	-0,07*
ANPS	-0,06	0,08	-0,02
Internet literacy	0,18***	0,03	0,20***

	Disclosure of contact data		
	B	SE	β
Intercept	2,42***	0,18	
Gender (1)	-0,21***	0,03	-0,18***
Age	-0,02**	0,01	-0,08**
Frequency of Facebook use	0,07***	0,02	0,10***
Privacy concerns	-0,19***	0,02	-0,30***
Parental mediation			
PPS	-0,09*	0,04	-0,08*
AVPS	-0,09	0,05	-0,06

| | ANPS | -0,05 | 0,06 | -0,03 |
| | Internet literacy | 0,03 | 0,02 | 0,05 |

(1)Coded as 0 = boy and 1=girl

* $p < 0,05$, ** $p < 0,01$, *** $p < 0,001$.

DISCUSSION & CONCLUSION

Despite the concerns of policy and parents about the possible risks related to the disclosure of personal information on Facebook, limited scholarly attention is dedicated to the factors that predict adolescents' privacy protection on this website. The goal of the present study is threefold: first we investigated which types of personal information adolescents disclose and second how they apply privacy settings on their SNS profile. Third, we explored what factors predict this privacy protection behavior.

In line with previous research (Taraszow et al., 2010), we noticed that young people disclose lots of profile information, probably because of the importance of identity development in the adolescence life stage and the characteristics of SNS. Although they are aware of potential privacy violations, young people tend to focus most on who has access to their data and they are especially cautious about who can contact them through personal information on SNS. Similar to the research of Debatin et al. (2009), we notice that young people still accepting 'friends' that they only heard of through friends or do not know at all.

Regression analysis showed that several factors predict adolescents' disclosure and profile-access management, also corresponding with differences in disclosing profile and contact data. Similar to the inquiry of Youn (S. Youn, 2009) and Young & Quan Haase (2009), we found

that privacy concerns seem to be an important predictor of adolescents' application of privacy setting management for the disclosure of both adolescents' profile and contact data.

Contrary to the previous research findings of Shin et al.(2012), parental mediation styles make a difference in adolescents' privacy protection behavior. Adolescents whose parents take on a parenting style that is characterized by the use of warmth strategies (e.g. discussion and support), namely the PPS and AVPS, are less likely than the children whose parents take on a style that is characterized by no intervention (see LFS) to disclose personal information on their Facebook page. Adolescents who experience an AVPS, or a combination of control and warmth strategies, reveal less profile data. While young people who experience a PPS or AVPS disclose less contact data. For the disclosure of profile data adolescents need rules to protect their personal information that in their eyes is not really harmful. While in the case of contact data the adolescents can easily be convinced, for example in a discussion, of the possible dangers related with the disclosure of this high identifiable data.

In accordance with Walrave et al. (2012), we also found that adolescents who spend more time on Facebook are more inclined to reveal contact information. A possible explanation is that the young people who use Facebook very frequently are more tempted to develop a Facebook identity that matches with their offline identity for getting social rewards.

A remarkable finding is that adolescents' Internet literacy only makes a difference for the disclosure of profile data. Internet literate users have the competencies to construct an identity and maintain social relations by disclosing enough profile data.

The outcomes of this study also show that gender and age are predictors for the revelation of contact but not of profile information. Female and older adolescents are less inclined to disclose contact data than boys and older adolescents. It is possible that males use Facebook to meet new people and/ or engage in new romantic relationships, while females use Facebook to consolidate existing relationships with friends (Tufecki, 2008). The result about age could be explained by children's development during adolescence. Throughout the adolescents period young people find it increasingly important to be in contact with their friends (Brown & Klute, 2003). When the adolescents grow older privacy-related concerns increase (Fox et al., 2000).

The strength of this study is the further differentiation in the disclosure of personal data on SNS by distinguishing profile and contact data. This distinction is important, because contact data contain more identifiable information and consequently need a higher privacy threat than profile data. This research has also some limitations that need to be acknowledged. Due to time restraints and the use of a quantitative method, a substantial amount of variance in adolescents' disclosure of personal information on SNS remains unexplained. In addition, the current division between profile and contact data is still open for improvement. Within the profile data there can be distinguished data who is also highly identifiable (e.g. photos of young home) or within

contact data there exists data that is less private (e.g. mail). Future research should better

differentiate additional categories of personal information. Notwithstanding the limitations, this

study makes a clear contribution to inspiring privacy awareness-raising strategies or media

literacy programs aiming at SNS users.

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