

Facets of Facebook

Use and Users

Edited by
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Chapter 2. Photo Publication Behavior of Adolescents on Facebook

Abstract: A persistent theme in Facebook concerns publishing photographs. This chapter aims to describe and analyze adolescent photo publication behavior on Facebook in terms of the young person's age, gender, privacy settings, and the sexting aspect. Collected dates are based on an online survey, which was conducted with 199 adolescent participants (aged 13 to 20 years old). Main constituents were prototypical pictures of 11 general picture categories, such as Portrait or Sexiness. Survey participants rated whether they would 1) choose such pictures for their self-presentation and 2) tolerate them for their friends' use as profile pictures, cover pictures, photos in their timeline, or a photo attached to a private message. The results lead us to conclude that, in general, users' tolerance for friends' usages of photos is higher than for their own self-presentation. We found that the most often used and tolerated picture category for cover pictures is a photo without any actual people in it. For all other picture types on Facebook, portraits are the type most often used and tolerated. Teens are quite careful regarding nudity. We found no adolescent willing to post photos with naked bodies on his/her timeline, and only 2% would even distribute such images via a private message. In hindsight, it is clear our survey, conducted online, and the results it provided demonstrate our developed research model with the six dimensions *User, Use, Privacy, Sexting, Picture Category, and Picture/Photo Publication Behavior* works well in studying adolescents' photo publishing behavior on Facebook.


Keywords: Adolescents, Facebook, Photo, Image, Privacy, Self-presentation, Sexting

Introduction

We live in an age in which social networking services (SNSs) accompany adolescents and adults throughout their daily routines. Our study focuses on adolescent Facebook users, aged 13 to 20 years. We ask how adolescents behave on Face-

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book concerning their postings of photos. Do they respect privacy? Are there any problems in terms of sexting? We pay special attention to both age and gender of Facebook users. We also study photo usage within the users' own content (profile pictures, cover pictures, timeline images, photos in private messages) and tolerance of their Facebook friends' photos. Our study examines the information behavior of adolescent Facebook users, as depicted by their sense of awareness and self-presentation on Facebook.

It is generally agreed Facebook is, at present, the world's most popular SNS. The site's monthly active users numbered 1.545 billion as of November 2015 (Statista, 2015). Facebook's system and services are easy for young and old alike to both use and understand. With a few mouse clicks, Facebook users can write a post, upload a new profile picture, create a photo album, "like," comment, or share posts of friends or reply requests. With a few more mouse clicks, they can start a group to discuss themes, create events, or design Facebook pages for celebrities or music groups. *Prima facie*, it seems there are no problems on the site, and this virtual life facilitates communication, regardless of distance and time. We wonder, however, if a downside exists to using Facebook. Some researchers believe it is possible: "As Facebook becomes increasingly integrated into everyday life, it becomes necessary to monitor and examine the platform's positive and negative impacts on society" (Wilson, Gosling, & Graham, 2012, p. 204). One major problem with such a simplistic interface is when every little thing someone wants to post is so easily published online, it leads to a significant amount of publicly available personal information, including photos that might best kept private. Moreover, one must remember Facebook's database never "forgets" anything added to it. Therefore, users of Facebook must remain information literate, current, aware, and cautious.

We believe the popular quotation, "A Picture Is Worth A Thousand Words" offers an effective illustration. A picture showing your smiling friend conveys happiness and satisfaction. In contrast, another photo depicting nonverbal aggression appears offensive and violent. With the aid of Facebook, its users can post "selfies" (photos a person takes of him/herself holding the camera at arm's length), as well as pictures of food, activities, clothes, quotations, and even images in which users are performing sexually or can be observed in some stage of nakedness. Many of these pictures are uploaded to Facebook with little forethought or are sent to others via private messages.

Studies have found the information behavior of Facebook users can be differentiated with regard to gender and age. A study of McAndrew and Jeong (2012, p. 2364) indicates women behave differently compared with men. They studied participants between 18 and 79 years old, and discovered women "expended more energy than men in using profile photographs as a tool for impression man-

agement” (McAndrew & Jeong, 2012, p. 2364). Could this mean, women are more reflective about the images they post on Facebook?

Information behavior is often dependent of the Facebook user’s purpose. Tifferet, Gaziel, and Baram (2012, pp. 4–5) found that one man, by changing his Facebook profile picture, appeared different to his viewers and became more appealing to single women. One Facebook profile “was accompanied by a photo of smiling young man holding a guitar; the second showed the same man without the guitar” (Tifferet, Gaziel, & Baram, 2012, p. 5). The scientists separated 100 female participants into two groups of the same size. On seeing the photo of a man without the guitar, only 5 women from the first group accepted the man’s request. Some of the female participants also responded they had a boyfriend. Sadly, they gave him a rejection. However, on seeing the photo of him with the guitar, 14 women from the second group accepted the man’s request.

Thus, picture selection can produce different results. Wang, Moon, Kwon, Evans, and Stefanone (2010, p. 232) conclude a picture’s attractiveness is an important factor in choosing whether to accept a friend’s request. “The results suggest that both male and female subjects were more willing to initiate friendships with opposite-sex profile owners with attractive photos” (Wang et al., 2010, p. 232). Nadkarni and Hofmann (2012, p. 245) creates the dual-factor model of FB use, which represents two social needs, namely, the need to belong and the need for self-presentation, as essential with regard to using the site. Facebook enables users to create a profile for self-presentation. Nadkarni and Hofman (2012) write that Facebook “leaves itself open to the possibility that its users display their idealized, rather than accurate, selves through their profiles” (p. 246).

Self-presentation encompasses not only profile pictures, but also information about hobbies, notice board updates, likes, or pictures with comments. DiMicco and Millen (2007, pp. 385–386) found via interviews that self-presentation via Facebook is dependent on one’s perceived audience. As an example, one interviewee deleted nothing and had pictures showing him “drinking alcohol (including directly out of a beer keg) and attending numerous college parties.” Such pictures were on display for all, including his employer, to view (DiMicco & Millen, 2007, p. 385). This interviewee did not see his self-presentation in Facebook as a part of his professional life, and seemed to believe it represented his personal life only. Another interviewee, however, did believe self-presentation via Facebook was more critical with regard to the business world. Before he started a new job, all information from Facebook was deleted. This interviewee “removed all photos of himself involving ‘drinking alcohol’” (DiMicco & Millen, 2007, p. 386).

Consequently, we see self-presentation in SNSs correlates with disclosure of personal information. Beldad and Koehorst (2015, p. 191) have reported the disclosure of such information of adolescent users is dependent on or influenced

by their habits, perceived control, and information-related benefits. They determined participants do not publish personal information without first thinking about the possible negative consequences.

Haferkamp, Eimler, Papadakis, and Kruck (2012, p. 95) discovered differences by using pictures in the German SNS StudiVZ relating to gender. Women prefer to use portraits of faces, while men use pictures that present their whole body, but also “the environment and other people” (Haferkamp et al., 2012, p. 95). Another interesting discovery from Haferkamp et al. (2012) found that a woman seeks to post a presentation of herself that is a “creative and elaborated fashioning” (p. 96).

Kuo, Tseng, Tseng, and Lin (2013) found that “males are more engaged in expressing information than women [...], while females are more involved in privacy control than men” (p. 641). Maybe culture also influences self-presentation (Kuo et al., 2013, p. 642). Vanderhoven, Schellens, Valcke, and Raes (2014, p. 4) indicated users release textual information such as name, date of birth, and gender. “The presence of pictures and interest [...] is proportionally high, while videos, textual wall posts, games/applications and notes seem to be less popular aspects of Facebook” (Vanderhoven et al., 2014, p. 4). Older teenagers post more pictures than younger ones.

Vanderhoven et al. (2014, p. 4) also observe women post more pictures than men do. With pictures, they not only tag more people than men do, they are also tagged more often. The authors acknowledge, however, “the amount of risk represented in pictures and videos is not very high” (Vanderhoven et al., 2014, p. 5). Thus, it is reassuring to learn only a few teenagers “show risky pictures to friends-of-friends than friends” (Vanderhoven et al., 2014, p. 5). Even so, the researchers found “23% are tagged in pictures of themselves partying, 13% in pictures in which they use alcohol, and 16% in pictures of themselves in swim [or] underwear, while these pictures can be seen by friends-of-friends” (Vanderhoven et al., 2014, p. 7). Information carrying some potential for risk includes “alcohol abuse, partying, or nudity” (Vanderhoven et al., 2014, p. 7).

With regard to gender differences Peluchette and Karl (2008, p. 96) found women post pictures or information on themes of romance or cuteness, while men post potentially risky pictures, presenting, for example, sex or alcohol. Regarding the aspect of alcohol, Burkell, Fortier, Wong, and Simpson (2014, p. 980) found in their study that participants do reflect before they publish content, instead posting then deleting content later. Their participants were between 18 and 42 years old. With regard to younger participants’, pictures including drinking alcohol or going to parties “are essentially *de rigueur*” (Burkell et al., 2014, p. 980). Hereby no pictures are posted showing the drinking and partying escalated (e.g.

people who vomit or look drunk). A striking aspect is that older participants tend not to post such pictures; if they do, they delete them later.

Madden, Lenhart, Cortesi, Gasser, Duggan, Smith and Beaton (2013, pp. 71–72) reveal a number of interesting statements by teenagers. One 14-year-old girl stated, “I’m such a different person online. I’m more free. And obviously, I care about certain things, but I’m going to post what I want. I wouldn’t necessarily post anything bad that [I] wouldn’t want them to see” (Madden et al., 2013, p. 71). This explains why she did not accept a teacher’s friend request. She apparently is making the distinction between a professional relationship at school and a one occurring in her leisure time. Because teachers can get a wrong impression of a student, in another instance, an 18-year-old boy deleted pictures that presented him showing the middle finger.

With regard to the current state of gender- and age-related research concerning information behavior on Facebook, we identified a remarkable gap. We are unable to find comprehensive studies on photo publication behavior of adolescent Facebook users. Which kinds of pictures do adolescent men and women use for communicating on Facebook? Do younger teens post different picture types than older teens? Will adolescent Facebook users tolerate pictures of friends they would not post of themselves? With respect to these queries, we arrive at our first group of research questions (RQs):

- RQ1: Are different preferences evident between age groups with regard to the content of publishing a photo on Facebook?
- RQ2: Is there a difference between individuals’ use of photos on Facebook and that of their friends’ on the site?
- RQ3: Are adolescent men and women using different photo categories for their self-presentations on Facebook?
- RQ4: Are adolescent men and women restraining themselves differently with regard to generating a positive public image?
- RQ5: Is the behavior of adolescent Facebook users, divided by age and gender, differentiated with regard to photos, which they choose *not* to use?
- RQ6: Do adolescent Facebook users reflect on their photos’ content before uploading them?
- RQ7: How often do adolescent Facebook users upload an image?

Privacy concerns in Facebook make such considerations critical issues. As noted above, Facebook does not “forget”; posted content is saved in its database forever. However, Facebook does offer different privacy settings with regard to personal content. Facebook users can choose between whether a specific picture can be viewed only by certain friends or be publicly available to everyone. With these site-provided privacy settings, users decide which content should reach which

audience. Are all adolescent Facebook users knowledgeable about these choices? Do they know posted pictures can be downloaded by everyone who has access to the picture? Boyd and Hargittai (2010) noted Facebook users “who are more engaged on Facebook are more likely to modify their privacy settings more frequently.” On the other side, they learned that of Facebook users who only used the site occasionally, a quarter of them never changed privacy settings (Boyd & Hargittai, 2010).

Unsurprisingly, Facebook users who are characterized as regular users make more use of privacy settings (Boyd & Hargittai, 2010). This discovery is confirmed by results from Debatin, Lovejoy, Horn, and Hughes (2009) who found the 9 % of Facebook users unfamiliar “with privacy settings (...) were also more likely to not protect their profiles”; yet the opposite held as well: Facebook users who are “familiar with Facebook privacy issues (...) were also likely to restrict their profiles (91 %) through privacy settings” (Debatin et al., 2009, p. 93).

Another study revealed user age does not necessarily matter concerning applying appropriate privacy settings: “It is surprising that older teenagers are not more likely to keep their profile private, given the awareness-raising messages to which they will have been exposed” (Livingstone, Haddon, Görzig, & Ólafsson, 2011, p. 39). They also write parents may have told their children to set their profiles to “private,” and it is important to begin with instructions early for young children (Livingstone et al., 2011, p. 39).

Privacy settings allow Facebook users the opportunity to hide pictures from some users. One survey study found that 20 % of Facebook users publish pictures that employees perhaps ought not to see (Peluchette & Karl, 2008, p. 96). Activities depicted such things as drinking alcohol and partying are among those one might keep private (Peluchette & Karl, 2008, p. 96).

Why do Facebook users have bad experiences with Facebook and personal data misuse when Facebook offers such a variety of privacy settings? If Facebook users are not aware they can change their privacy settings, then a lack of understanding must exist. “We can assume the consequences to be even worse when publicly exposing risky information related to alcohol and drug abuse, pictures in underwear, signs of aggression, etcetera” (Vanderhoven, Schellens, Valcke, & Raes, 2014, p. 2). Thus, regarding these aspects, specifically, we also want to examine privacy on the site. The next two RQs support this aim:

- RQ8: Do adolescent Facebook users understand Facebook friends can download their photos?
- RQ9: Are adolescent Facebook users aware of the possibilities to change their privacy settings?

With the advent of the electronic age, and in particular, smartphones, tablets, and other mobile devices, people can receive and send pictures, videos, and messages with sexually oriented content. We now have *sexting*, a portmanteau comprised of *sex* and *texting* (Livingstone & Görzig, 2012, p. 151). The following exchange is paradigmatic of the phenomenon:

Girl: What's up?

Boy: I am feeling hot tonight. I need to see you.

Girl: O.K. Do you want to see some pictures?

Boy: Cool. (Katzman, 2010, p. 41)

“Teens are using or misusing cell phones as part of their sexual interactions and explorations” with sexting including the “creating, sharing, and forwarding of sexually suggestive nude or nearly nude images by minor teens” (Lenhart, 2009, p. 3). This sending or receiving of such pictures, of course, is not dependent on cell phones, for images can also be sent via other social media systems, email traffic, or websites (Katzman, 2010, p. 41). It is simply so much easier to do with mobile devices.

Lenhart (2009, p. 2) observed older teenagers like to send and receive more nude or nearly nude images more than younger adolescents do. Of participants, 4 % (12–17 years old) and twice as many of older teens (8 %) have sent such pictures. Receiving a nude or a nearly nude image is also twice as likely for older teenagers than for younger teens (12–17 years old) (Lenhart, 2009, p. 2). Another study (Mitchell, Finkelhor, Jones, & Wolak, 2012, p. 15) found that girls are more likely to appear in, create, or receive nude or nearly nude images or videos.

Why do adolescents send such potential risky photos or text messages? The National Campaign and COSMO Girl (a product of yellow press) (2008, p. 1) conducted a survey with 13- to 26-year-old participants. In the most cases, regardless of age, participants sent or posted sexually suggestive content to a boyfriend or a girlfriend. The second most-observed aspect to sending such photos is when the sender and the recipient do not know each other, but the sender wants to date or hook up with the recipient. In this case, boys are slightly more likely to send such pictures than girls are (The National Campaign and COSMO Girl, 2008, p. 2). Mitchell et al. (2012, p. 16) offer participants’ observations, for example, “I was just dating a boy and he wanted a picture and I just sent him my picture” or “Well, I did not have a boyfriend at this time, and I was curious as to what my body would look like to other people...so I took some pictures” (Mitchell et al., 2012, p. 16).

It becomes clear that people not only want to seem attractive or to flirt, they also want to provoke. Statements such as “in the girls’ locker room and some girl

asked if anyone wanted to see a pic of her and her boyfriend, and we thought it would be them hanging out but they were in bed together,” or “[I was] sitting in [a] room and playing guitar. Got text message. Opened it. It showed pictures of breasts, [a] vagina. I immediately erased it” (Mitchell et al., 2012, p. 16). Katzman notes that “the obvious danger associated with sexting is that the material can be easily and widely disseminated. (...) Teens need to understand that nothing in cyberspace ever really gets deleted. (...) Even if the teen deletes the text or image, it can be copied and sent/posted elsewhere” (Katzman, 2010, p. 42).

Another aspect is for some people, sexting is not something that seems important: “Yeah it happens a lot, my friends do it all the time, but it’s not a big deal” (Lenhart, 2009, p. 9). For others, sexting is slutty and carries the threat of potential risk with significant consequences: “I’ve been asked to send naked pics, but I think that’s stupid. You can ruin your reputation. Sometimes I wonder how girls can send naked pics to a boy. I think it’s gross. They’re disrespecting themselves” (Lenhart, 2009, p. 9). Nevertheless, there are also people who see in sexting a new opportunity – but a risky one: “a safer alternative to real-life sexual activity” (Lenhart, 2009, p. 8). This leads to our next RQs with a desire to learn how adolescents handle sexting:

- RQ10: Does the willingness relating to sexting differentiate with regard to the age groups’ self-presentation activity and their friends’ use?
- RQ11: Does the willingness relating to sexting differentiate with regard to genders’ self-presentation and their friends’ use?

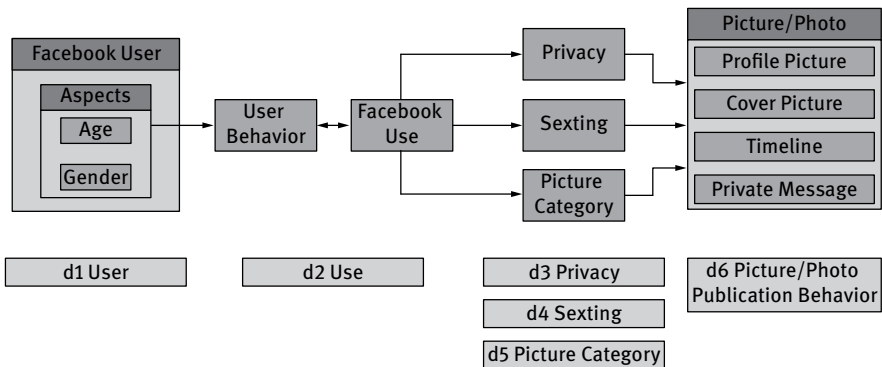


Figure 1: Our Research Model.

Figure 1 depicts research aspects from our study. The six dimensions *User* (d1), *Use* (d2), *Privacy* (d3), *Sexting* (d4), *Picture Category* (d5), and *Picture/Photo Publication Behavior* (d6) are related to each other. The first dimension *user* refers to

Facebook users with special consideration of their age and gender. For our study, we limited these aspects to the target group of male and female adolescents between 13 and 20 years old (d1). For this target group, we wanted to investigate how and which *privacy* settings they are using *pictures/photos* on Facebook (d2, d3), and how these relate to *sexting* (d4). As the model shows, we focused on four types of Facebook pictures (d6) explained in more detail in the next section describing picture categories in detail. The dimension of *picture/photo publication behavior* (d6) includes the participants' Facebook self-presentations as well as the behavior of their friends.

Methods

Our methods section is divided into aspects of picture categories, survey, and data cleansing. To analyze pictures on Facebook, we determine and distinguish between two picture categories: types of Facebook pictures and a general picture category. The category types of Facebook pictures include all possible picture types a Facebook user can upload. Altogether, there exist four subcategories:

- profile picture;
- cover picture;
- timeline;
- private message.

The *profile picture* is the image a user posts as her/his own profile picture. It appears in the profile, beside comments, or during chat conversations. The *cover picture* is displayed at the top of the user's personal profile. The *timeline photo* includes all pictures a profile owner has posted on her/his own Facebook page. A *private message photo* is a picture a profile owner posts in a private message, which only the message recipient(s) can view.

The general picture category is based on a Facebook content analysis by Shelton and Skalski (2013, pp. 343–344), who created 11 categories to use in analyzing Facebook users' photo behavior. These categories form the foundation of our general picture category. We present all general picture categories utilized for our study (see Table 1). We used five categories from Shelton and Skalski and limited the fourth category on heterosexual content, because, especially for very young teens, the boundaries between homosexuality and friendship between girls or between boys could be rather fuzzy.

Hence, we created six new categories, which provide an opportunity to expand our study to several relevant thematic areas or categories, such as “No

Person Depicted” or “Portrait” that are standards for photos used on social media services. Sexting and nudity are current topics as already shown in the state of the research.

Table 1: Categories for General Picture Categories.

Category Number	Category Name	Definition and Source	New, Modified or Unmodified
1.	Partying Shown	“[...] included depictions of groups of three or more in a festive-looking atmosphere” (Shelton & Skalski, 2013, p. 343)	unmodified
2.	Alcohol Shown	“[...] any photo with persons holding alcohol (bottle/glass/can/cup) or with alcohol in the background, etc.” (Shelton & Skalski, 2013, pp. 343–344)	unmodified
3.	Drug Use Shown	“[...] included someone smoking a cigarette or joint, using marijuana paraphernalia, injecting needles etc.” (Shelton & Skalski, 2013, p. 344)	unmodified
4.	Physically/Sexually Suggestive Contact (heterosexual)	“[...] included people deliberately kissing, holding hands, grinding, licking, touching and/or grabbing sexual body parts, etc.” (Shelton & Skalski, 2013, p. 344)	modified, limitation of hetero “couples”
5.	Sexiness	includes people in clothes/positions which should turn someone on; e.g. (low neckline, sexy underwear/sexy swimming wear, sexy posing in (sexy) swimming wear/(sexy) underwear; people aren’t fully naked and genitalia, booty and breast are covered (short or complete)	new
6.	Naked – Head and Full Body	includes people who are completely naked (nothing covered): the whole body and face are visible (it is also ok when parts of the legs/arms aren’t visible – focus lies on breath/booty with genitalia)	new
7.	Naked – Without Head but Full Body	includes people who are completely naked (nothing covered): the whole body but not the face is visible (it is also ok when parts of the legs/arms aren’t visible – focus lies on breath/booty with genitalia)	new

Table 1 (continued)

Category Number	Category Name	Definition and Source	New, Modified or Unmodified
8.	Nonverbal Aggression	“[...] was someone hitting and/or kicking another person, physical conflict with others, displaying the middle finger, etc.” (Shelton & Skalski, 2013, p. 344)	unmodified
9.	Trend	pictures for e.g. ice bucket challenge, duck-face, AIDS campaign, political activities, etc.	new
10.	No Person Depicted	pictures or computer graphics with e.g. comic, object, landscape, animal, etc., but without photos of humans; drawn pictures of humans are allowed	new
11.	Portrait	a photo in a standard portrait format (head shot/head shot with a part of the upper body) and without attributes from other categories (e.g., Sexiness, Nonverbal Aggression, etc.)	new

For every category, prototypical pictures were defined that represent their respective category (see Figure 2). They show an adolescent male or female person or a group in a scenario appropriate for the category. Generally, we chose an adolescent girl and an adolescent boy prototypical picture per category, because the pictures obtain – depending on the gender – different effects. For example, for some people, it makes a difference if a picture shows a girl in a bikini or a boy in swimming trunks. Because we wanted to accurately determine the outcome of such subtle differences, we chose for categories 2, 3, 5, 8, and 11 both a male and a female prototypical picture. Since category 4 automatically shows a male and a female person, only one prototype was needed here. Furthermore, category 1 needed only one prototype because it refers to a group and not to a single person. As we wanted to keep the number of prototypical pictures as low as possible, we also used only one prototype for category 9 because in our opinion, gender does not preponderate. For ethical reasons, we did not want to show our adolescent participants any nude images. Therefore, the categories 6 and 7 were displayed in written form. Category 10 is a collage of four representations to demonstrate the category’s diversity. Thus, we have 22 prototypical pictures for our 11 categories.

The survey includes 66 questions that can be divided into four parts:

- questions about a prototypical picture representing a category (questions 1–54);


- questions about picture uploading behavior to Facebook (questions 55–57);
- questions about security and privacy concerns regarding pictures (questions 58–60);
- demographical and cultural information (questions 61–66).

The survey was created during December 2014–April 2015, and was conducted from April 2015–July 2015. We used UmfrageOnline.com to provide our survey. The version for students offers many functions (e.g., unlimited surveys, extensive question types, image inclusion, etc.), thus it was the best free product available for our study. We promoted the survey on Facebook via Facebook groups (postings), private messages on Facebook, and the Facebook timeline of private individuals as well as Facebook pages. Additionally, we promoted our survey on other Internet services and sites, contacted institutions, and visited three schools. The survey was available in German and Turkish languages. For the Turkish version, three native Turkish speakers translated the German version. Our questionnaire was pretested by four individuals.

It was necessary to clean up the data gathered from our survey. Altogether, 488 people participated. For the analysis, we could account for 199 participants. At first, 278 participants had to be excluded from the survey because they did not fit the age group of 13–20 years or they did not complete the survey. The remaining 210 participants completed the survey and were within the appropriate age range, but 11 of them still could not be considered. For example, some statements were regarded as questionable. Some of them stated, in part, they use naked pictures for a profile picture, a cover picture, or the timeline. They chose this answer, however, in an incomprehensible way or also stated they were conservative rather than liberal, contradicting their own statements. Therefore, because we believed the accuracy of these statements was unreliable, we elected to remove conspicuous participants, leaving us with 199 survey participants.




Results

The following paragraph illustrates the results of our analysis. We considered 199 questionnaires for the evaluation. Distributed by age categories, there were 24 participants between 13 and 14 years, 35 between 15 and 16 years, 49 between 17 and 18, and 91 between 19 and 20 years old. Of the participants, 156 are women and 43, men. If we do not assume a participant value by age groups or gender, the precise indication of participant number is still indicated additionally.

Cat.	General Picture Category	Age Class					Prototype Picture
		13-14	15-16	17-18	19-20	Total	
1. Partying Shown	PP/S	33%	15%	18%	22%	22%	1. 
	PP/O	58%	46%	37%	51%	48%	
	CP/S	54%	44%	51%	51%	50%	
	CP/O	63%	51%	59%	68%	60%	
	T/S	42%	38%	39%	57%	44%	
	T/O	63%	49%	56%	71%	60%	
	PM/S	33%	38%	49%	41%	40%	
	PM/O	54%	51%	51%	68%	56%	
	NIAMA/S	33%	35%	20%	22%	28%	
	2. Alcohol Shown	PP/S	2%	1%	1%	4%	
PP/O		8%	6%	3%	7%	6%	
CP/S		4%	1%	1%	5%	3%	
CP/O		8%	7%	3%	7%	6%	
T/S		0%	6%	4%	16%	7%	
T/O		8%	7%	5%	16%	9%	
PM/S		13%	12%	10%	14%	12%	
PM/O		13%	13%	11%	23%	15%	
NIAMA/S		85%	85%	90%	75%	84%	
3. Drug Use Shown		PP/S	8%	1%	3%	9%	5%
	PP/O	29%	3%	10%	17%	15%	
	CP/S	13%	1%	2%	8%	6%	
	CP/O	29%	3%	11%	16%	15%	
	T/S	6%	3%	5%	13%	7%	
	T/O	29%	3%	17%	20%	17%	
	PM/S	6%	13%	10%	15%	11%	
	PM/O	29%	10%	20%	23%	21%	
	NIAMA/S	81%	87%	87%	77%	83%	
	4. Physically/Sexually Suggestive Contact (Heterosexual)	PP/S	50%	52%	49%	40%	48%
PP/O		71%	71%	61%	57%	65%	
CP/S		50%	36%	49%	34%	42%	
CP/O		75%	66%	59%	58%	65%	
T/S		17%	24%	43%	40%	31%	
T/O		63%	60%	61%	62%	61%	
PM/S		21%	27%	43%	39%	32%	
PM/O		42%	46%	53%	51%	48%	
NIAMA/S		33%	33%	24%	33%	31%	
5. Sexiness		PP/S	6%	3%	1%	5%	4%
	PP/O	21%	7%	8%	14%	13%	
	CP/S	6%	1%	2%	2%	3%	
	CP/O	19%	7%	7%	11%	11%	
	T/S	2%	0%	3%	11%	4%	
	T/O	15%	10%	9%	18%	13%	
	PM/S	11%	11%	9%	13%	11%	
	PM/O	23%	17%	26%	26%	23%	
	NIAMA/S	87%	86%	88%	80%	85%	
	6. Naked – Head and Full Body	PP/S	0%	0%	0%	0%	0%
PP/O		0%	0%	2%	0%	1%	
CP/S		0%	0%	0%	0%	0%	
CP/O		0%	0%	2%	0%	1%	
T/S		0%	0%	0%	0%	0%	
T/O		0%	0%	2%	0%	1%	
PM/S		4%	3%	0%	2%	2%	
PM/O		10%	3%	4%	3%	5%	
NIAMA/S	96%	97%	100%	98%	98%		

PP/S: Profile Picture/Self PP/O: Profile Picture/Other CP/S: Cover Picture/Self
 CP/O: Cover Picture/Other T/S: Timeline/Self T/O: Timeline/Other
 PM/S: Private Message/Self PM/O: Private Message/Other NIAMA/S: Not in any mentioned area

Figure 2: Facebook Photo Publication Behavior of Adolescent Facebook Users. (13–14 years old: $N = 24$; 15–16 years old: $N = 35$; 17–18 years old: $N = 49$; 19–20 years old: $N = 91$; for the self-presentation values, divergences of at least 1 or at most 4 participants partly exist).

Cat.	General Picture Category	Age Class					Prototype Picture
		13-14	15-16	17-18	19-20	Total	
7. Naked – Without Head but Full Body	PP/S	0%	0%	0%	0%	0%	No Pictures, only the following descriptions: 6 a: Here would be a picture of a boy/a man who is completely naked. His face is not visible in the picture. 6 b: Here would be a picture of a girl/a woman who is completely naked. Her face is not visible in the picture.
	PP/O	0%	0%	2%	0%	1%	
	CP/S	0%	0%	0%	0%	0%	
	CP/O	0%	0%	2%	0%	1%	
	T/S	0%	0%	0%	0%	0%	
	T/O	0%	0%	2%	0%	1%	
	PM/S	4%	1%	1%	3%	2%	
	PM/O	4%	1%	10%	3%	5%	
	NIAMA/S	96%	99%	99%	97%	98%	
	NIAMA/O	19%	3%	10%	13%	11%	
8. Nonverbal Aggression	PP/O	19%	11%	13%	16%	15%	8 a:  8 b: 
	CP/S	13%	9%	5%	12%	10%	
	CP/O	19%	11%	14%	16%	15%	
	T/S	6%	6%	7%	16%	9%	
	T/O	23%	14%	16%	24%	19%	
	PM/S	36%	13%	18%	22%	22%	
	PM/O	23%	16%	28%	24%	22%	
	NIAMA/S	57%	79%	76%	71%	71%	
	NIAMA/O	8%	10%	12%	14%	11%	
	PP/O	25%	14%	20%	26%	22%	
9. Trend	CP/S	4%	10%	6%	12%	8%	9: 
	CP/O	13%	11%	16%	25%	16%	
	T/S	0%	13%	10%	30%	13%	
	T/O	25%	20%	22%	34%	25%	
	PM/S	13%	23%	31%	37%	26%	
	PM/O	29%	40%	43%	49%	40%	
	NIAMA/S	79%	61%	57%	47%	61%	
	NIAMA/O	8%	16%	28%	19%	18%	
	PP/O	50%	40%	47%	42%	45%	
	10. No Person Depicted	CP/S	46%	50%	70%	63%	
CP/O		67%	63%	71%	71%	68%	
T/S		17%	24%	26%	30%	24%	
T/O		46%	46%	59%	59%	53%	
PM/S		17%	29%	38%	31%	29%	
PM/O		54%	51%	53%	51%	52%	
NIAMA/S		38%	24%	11%	22%	23%	
NIAMA/O		36%	82%	89%	94%	90%	
PP/O		94%	81%	93%	87%	90%	
11. Portrait		CP/S	53%	38%	44%	45%	45%
	CP/O	85%	79%	80%	81%	81%	
	T/S	47%	38%	53%	62%	50%	
	T/O	90%	77%	88%	84%	84%	
	PM/S	42%	38%	48%	48%	44%	
	PM/O	71%	69%	80%	76%	74%	
	NIAMA/S	4%	13%	8%	5%	8%	
	NIAMA/O	19%	3%	10%	13%	11%	
	PP/O	25%	14%	20%	26%	22%	
	CP/S	4%	10%	6%	12%	8%	

PP/S: Profile Picture/Self
 CP/O: Cover Picture/Other
 PM/S: Private Message/Self

PP/O: Profile Picture/Other
 T/S: Timeline/Self
 PM/O: Private Message/Other

CP/S: Cover Picture/Self
 T/O: Timeline/Other
 NIAMA/S: Not in any mentioned area

Figure 2. (continued)

We learned how many participants stated they would use an image of the respective category type (indicated with “S” in the figure) as well as their acceptance when friends use those pictures categories (“O”) (see Figure 2). Facebook picture types include profile pictures (“PP”), cover pictures (“CP”), pictures on a timeline (“T”), or in private messages (“PM”). Additionally, users could state they would not use a photo, regardless of choice (“NIAMA/S”).

RQ1: Are different preferences evident between age groups with regard to the content of publishing a photo in Facebook?

For RQ1, we divided the representation of the results into the four types of Facebook pictures. Regarding *profile pictures*, it is not surprising that around 90% of participants would use and accept pictures of the category Portrait (category 11).

We did find it rather surprising, however, that the second most common photo choice is the category Physically/Sexually Suggestive Contact (heterosexual) (category 4). Regarding such sexually related content, the acceptance for images by friends (65 %) is higher than for self-usage (48 %). This category is followed by Partying Shown (category 1) and No Person Depicted (category 10). Striking here is that the 13–14-year-old teens tell us that they would use pictures according to the category Nonverbal Aggression (category 8) versus No Person Depicted.

For the self-presentation of *cover pictures* and usage by friends', No Person Depicted (category 10) received on average the highest valuation. Photos from this category are especially useful as cover pictures. If we look at the age distribution for this category, only those 13–14 years old would not prefer those pictures as first choice for their cover pictures. The youngest Facebook users prefer Partying Shown (54 %) for their own photos, and for others, Portraits (85 %).

Teens prefer that their own *timeline* photos contain portraits (50 %) and partying (44 %) and accept images with portraits from others as well (84 %), but also photos with Physically/Sexually Suggestive Content (61 %) and, again, partying photos (60 %). If we more closely at the timeline self-presentation of the 13–14- and 15–16 year olds, we presume younger users were unsure about their preferences for timeline pictures. At age 13–14 years, teens do not use pictures of the category Trend (category 9), but 25 % find it acceptable when their friends do. We detected a similar pattern for the category Alcohol Shown (category 2). While no single 13–14-year-old teen would publish a photo of her/himself with alcohol, 8 % tolerate such photos from friends. At this age, any form of alcohol consumption is prohibited in many countries. Therefore, we find it unsurprising this age group refrains from posting such pictures of themselves.

Even for pictures in a *private message*, the category Portrait (category 11) received a high score (self: about 44 %, others: 74 %). On the first ranks are categories that also received high rankings for the additional three Facebook picture types. We expected to see higher values for categories where their content should not be seen by everyone, for example, the category Sexiness or for pictures in which nudity is shown. For all sexiness-related categories (those numbered 4 to 7), the values for self-presentation are about half those of friends' photos.

Especially for private messages, trend photos become more popular as the user age rises: for own private messages, only 13 % of the youngest participants post such images, but 23 % of teens aged 15–16 do, along with 31 % of those aged 17–18, and 37 % of the oldest teens. Furthermore, trend photos in private messages from others are more often accepted by older teens. Here, the development starts at 29 % (13–14) and ends at 49 % (19–20). In contrast, use and acceptance of photos of the category Physically/Sexually Suggestive Contact declines as the age range rises. While 50 % of the 13–14-year-old teens accept use such images for them-

selves as profile pictures (71% for others), only 40% of adolescents aged 19–20 would upload such photos for themselves (57% for photos from their friends).

RQ2: Is there a difference between individuals' use of photos on Facebook and that of their friends' on the site?

In nearly every case, we observed a greater tolerance of friends' choices compared with one's own self-presentation use. For pictures assigned to the category Portrait, there are recognizable differences. Among the following age groups – 13–14, 15–16, and 19–20 year olds – Facebook users have slightly higher scores for their own use, compared with accepting such pictures by friends.

What we find interesting in these data (with regard to Figure 2) is sometimes, the shares of self-presentation and tolerance of friend's use of the same category are identical. We found 13% of our adolescents (those 13–14 years old) would use private message pictures, which are classified into the category Alcohol Shown. We think it is striking that this tolerance with regard to friends' use of such pictures (those 13–14 years old) is even as high as 13%.

A similar case could be observed regarding the category Drug Use Shown. Of our 15–16-year-old participants, only 3% would post a picture on their timeline that depicted them smoking. If friends use such pictures of themselves, however, only 3% of all 15–16-year-old participants find it acceptable. The previous case, showing one's own self-presentation and tolerance relating to friends' use of pictures of the same category being similar, is recognizable by the category Nonverbal Aggression. Of all 13–14-year-old participants, 19% would present pictures of themselves (e.g., where the middle finger is shown) as a profile picture. If they see profile pictures of friends where a similar gesture is visible, the same share, 19%, would find it acceptable.

Moreover, one case with regard to Figure 2 is conspicuous. If we delve further into the category Sexiness and look at the column of the 15–16-year-old participants, we learn none would present such pictures of themselves on the timeline. However, if friends present pictures of themselves in bikinis or bathing suits, 10% of all 15–16-year-old participants would find such images acceptable. With a few exceptions, this tolerance regarding friends' use of pictures is higher than one's own use of the same picture category. For example, only 8% of 13–14-year-old participants would post pictures of the category Drug Use Shown as profile pictures, but 29% find it acceptable if friends choose to do so. For 13–14-year-old participants, using photos for self-presentation for the category Portrait is quite high (47% would use such pictures in their timeline), and this group's tolerance of others' use of Portrait photos is even higher (90%).

RQ3: Are adolescent men and women using different photo categories for their self-presentations on Facebook?

Cat.	Gender	General Picture Category								
		PP/S	PP/O	CP/S	CP/O	T/S	T/O	PM/S	PM/O	NIAMA/S
1. Partying Shown	Male	26%	35%	58%	53%	53%	56%	40%	51%	26%
	Female	20%	51%	48%	65%	46%	85%	42%	62%	25%
	Total	23%	43%	53%	59%	50%	61%	41%	56%	25%
2. Alcohol Shown	Male	10%	9%	12%	9%	20%	15%	16%	17%	76%
	Female	1%	5%	1%	5%	7%	10%	12%	17%	84%
	Total	6%	7%	6%	7%	14%	12%	14%	17%	80%
3. Drug Use Shown	Male	14%	17%	9%	17%	13%	17%	18%	22%	73%
	Female	4%	13%	5%	13%	7%	18%	11%	21%	84%
	Total	9%	15%	7%	15%	10%	18%	14%	21%	78%
4. Physically/ Sexually Suggestive Contact (heterosexual)	Male	42%	49%	37%	42%	40%	49%	28%	35%	33%
	Female	46%	66%	41%	67%	34%	65%	38%	53%	31%
	Total	44%	57%	39%	55%	37%	57%	33%	44%	32%
5. Sexiness	Male	9%	12%	6%	10%	15%	13%	15%	16%	74%
	Female	2%	13%	2%	10%	4%	14%	11%	26%	86%
	Total	6%	12%	4%	10%	9%	13%	13%	21%	80%
6. Naked – Head and Full Body	Male	0%	0%	0%	0%	0%	0%	6%	7%	94%
	Female	0%	1%	0%	1%	0%	1%	1%	4%	99%
	Total	0%	0%	0%	0%	0%	0%	3%	5%	97%
7. Naked – Without Head but Full Body	Male	0%	0%	0%	0%	0%	0%	5%	6%	95%
	Female	0%	1%	0%	1%	0%	1%	2%	4%	98%
	Total	0%	0%	0%	0%	0%	0%	3%	5%	97%
8. Nonverbal Aggression	Male	15%	14%	17%	16%	16%	19%	22%	20%	67%
	Female	10%	15%	8%	15%	9%	21%	21%	24%	73%
	Total	13%	15%	13%	16%	13%	20%	21%	22%	70%
9. Trend	Male	24%	21%	14%	14%	26%	28%	21%	30%	55%
	Female	9%	23%	8%	19%	16%	28%	32%	47%	56%
	Total	17%	22%	11%	17%	21%	28%	27%	39%	55%
10. No Person Depicted	Male	20%	26%	53%	60%	25%	44%	30%	35%	33%
	Female	20%	49%	62%	72%	26%	58%	31%	56%	18%
	Total	20%	37%	57%	66%	26%	51%	30%	46%	25%
11. Portrait	Male	85%	76%	44%	62%	52%	71%	38%	56%	13%
	Female	92%	92%	45%	86%	55%	88%	48%	80%	6%
	Total	89%	84%	44%	74%	53%	79%	43%	68%	9%

PP/S: Profile Picture/Self
CP/O: Cover Picture/Other
PM/S: Private Message/Self

PP/O: Profile Picture/Other
T/S: Timeline/Self
PM/O: Private Message/Other

CP/S: Cover Picture/Self
T/O: Timeline/Other
NIAMA/S: Not in any mentioned area

Figure 3: Facebook Photo Publication Behavior of Adolescent Facebook Users. (Male: $N = 43$; female: $N = 156$; for self-presentation values, divergences of at least 1 or at most 4 participants partly exist).

With regard to RQ3, we found similarities and differences relating to self-presentation of the genders (see Figure 3). For all groups of adolescents surveyed, 85% of men and 92% of women would use mostly pictures classified in the category Portrait for a profile picture. The second most-favored category, again for both men and women, is Physically/Sexually Suggestive Contact (heterosexual). What we found surprising is the share of participants who would use such pictures as profile picture. Of all participants, 42% of men and 46% of women would use

pictures that depict holding hands with or kissing their partner (category Physically/Sexually Suggestive Contact).

Differences in gender-specific information behavior are obvious when considering categories such as Drug Use Shown, Alcohol Shown, and Sexiness. In these categories, when they relate to profile pictures, more adolescent men (14 %) would use such pictures compared with women (4 %). Such images might show, for example, participants smoking a cigarette. With photos showing alcohol usage by adolescents, 10 % of men and only 1 % of women would use them as profile picture. Again, 9 % of our adolescent men, compared with only 2 % of our adolescent women, would prefer Sexiness photos as profile pictures, with the former showing them, for example, wearing only trunks and the latter, a bikini.

We found it striking that 53 % of men would mostly prefer pictures for their own timeline that present them partying, in contrast to only 46 % of women. In contrast to boys, girls prefer photos from other users in the categories of party photos, photos showing Physically/Sexually Suggestive Contacts, No Person images, and Portraits (across all four picture categories). In contrast to girls, for self-presentation, boys prefer photos from the categories Alcohol Shown and Drug Use Shown (albeit on a low level). More men than women upload Trend photos for self-presentation in profile pictures (24 % vs. 9 %), cover pictures (14 % vs. 8 %), and in their timelines (26 % vs. 16 %), but for private messages fewer boys use such Trend photos (21 % vs. 32 %). For photos of others, more girls (47 %) accept Trend photos than do boys (30 %).

RQ4: Are adolescent men and women restraining their choices differently with regard to generating a positive public image?

Do users exploit Facebook to build and maintain a positive public image of themselves? Of all our participants, 80 % want to create a positive image on Facebook with their profile picture. There are slight gender-specific differences, however, with 81 % of the girls hoping to reach this target, whereas only 74 % of the boys feel the same.

RQ5: Is the behavior of adolescent Facebook users, divided by age and gender, differentiate with regard to photos, which they choose *not* to use?

Which categories are less favored regarding the choice for profile picture, cover picture, timeline, and private message? Regarding preferred non-usage, Table 2 indicates that photos showing naked people or people wearing only bikinis or boxer shorts are very rarely used (98 % reject them). In addition, photos in the categories Sexiness, Alcohol Shown, and Drug Use Shown are seldom preferred. The last two categories, which have a rejection rate of more than 50 %, are Non-verbal Aggression and Trend. The first six categories include risky photos, which

could damage adolescent Facebook users' reputations at the worst, or at the least, send a wrong or bad message about the user. Surprisingly, Trend also represents a high rejection rate, with 61 % (and even higher for younger teens).

Table 2: Photo Categories an Adolescent Facebook User Would *Not* Use.

Rank	Rejection for Self-Presentation
1	Naked – Head and Full Body 98 %
	Naked – Without Head and Full Body 98 %
3	Sexiness 85 %
4	Alcohol Shown 84 %
5	Drug Use Shown 83 %
6	Nonverbal Aggression 71 %
7	Trend 61 %
8	Physically/Sexually Suggestive Contact (heterosexual) 31 %
9	Partying Shown 28 %
10	No Person Depicted 23 %
11	Portrait 8 %

To examine the distribution by age, again we use Figure 2. We see 19–20-year-old adolescents exhibit fewer scruples when publishing photos from the categories Alcohol Shown and Drug Use Shown. In contrast, for our 13–14-year-old participants, the majority rejects such pictures. In addition, only some 17–18-year-olds would accept photos showing naked bodies (without visible heads) in private messages, but only from other people (10 %) and would not post any of themselves (1 %).

Separated by gender (see Table 3), striking differences emerge between adolescent men and women. Both genders agree they would reject photos with naked bodies. Girls reject Sexiness images to a higher degree than boys do (86 % vs. 74 %). More women reject photos showing alcohol consumption (84 % vs. 76 %), drugs (84 % vs. 73 %), and nonverbal aggression (73 % vs. 67 %). Adolescent women also are somewhat more cautious with their self-presentation than adolescent men are.

Table 3: Photo Categories an Adolescent Facebook User Would *Not* Use by Gender.

Rank	Rejection/Male		Rejection/Female	
1	Naked – Without Head and Full Body	95 %	Naked – Head and Full Body	99 %
2	Naked – Head and Full Body	94 %	Naked – Without Head and Full Body	98 %
3	Alcohol Shown	76 %	Sexiness	86 %
4	Sexiness	74 %	Alcohol Shown Drug Use Shown	84 %
5	Drug Use Shown	73 %	Nonverbal Aggression	73 %
6	Nonverbal Aggression	67 %	Trend	56 %
7	Trend	55 %	Physically/Sexually Suggestive Contact (heterosexual)	31 %
8	No Person Depicted Physically/Sexually Suggestive Contact (heterosexual)	33 %	Partying Shown	25 %
9	Partying Shown	26 %	No Person Depicted	18 %
10	Portrait	13 %	Portrait	6 %
11	–		–	

RQ6: Do adolescent Facebook users reflect on their photos' content before uploading them?

We asked our participants about their picture uploading behavior on Facebook. 197 answered this question and 66 % of them always reflect on their behavior before uploading a photo to Facebook. Only 2% never think about their picture before publishing. The remainder of teens reflect sometimes (13 %) or often (19 %) before acting. Our findings are similar to those Burkell et al. (2014, p. 980) found for 18–42-year-old participants.

RQ7: How often do adolescent Facebook users upload an image?

Figure 4 compares the interval of image upload behavior on Facebook for the four types of Facebook pictures. For our participants, the majority uploads all types of photos at irregular intervals. Some teens have never published photos in their timelines or in private messages.

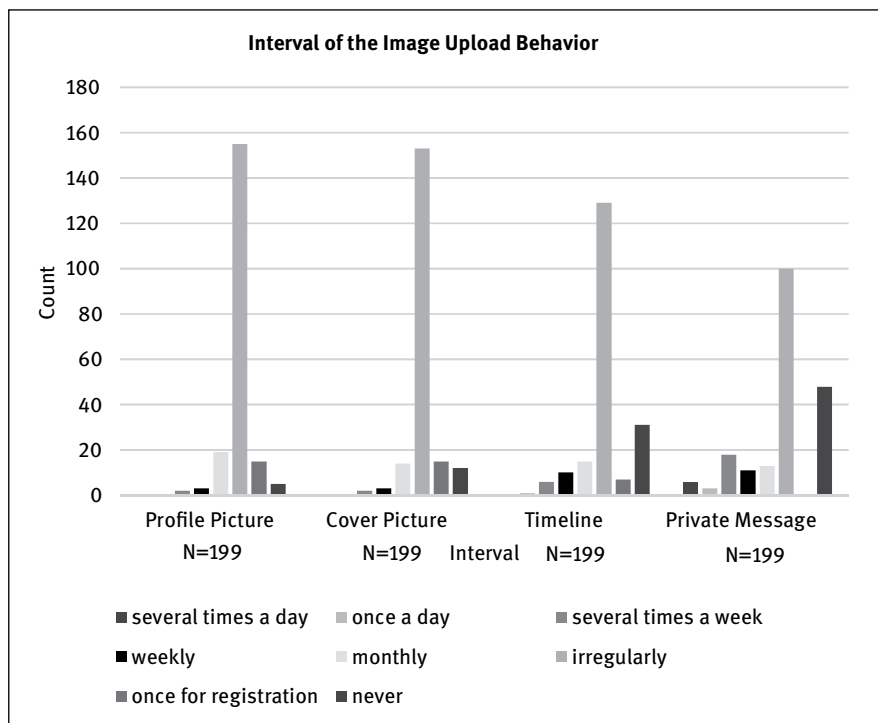


Figure 4: Photo Uploading Frequency.

RQ8: Do adolescent Facebook users understand Facebook friends can download their photos?

Privacy settings are important as they relate to disclosure information and for self-presentation. Beldad and Koehorst (2015, p. 192) found that habit and perceived control affects the disclosure of personal information. Moreover, “the finding that respondents’ perception of control over their personal information also determines information disclosure seems to suggest that respondents do not just habitually and blindly share information without taking into account the possible negative consequences of disclosure” (Beldad & Koehorst, 2015, p. 192). Looking at the frequency values across all age groups, the majority of participants is aware that their friends can download and even redistribute photos received from others. For profile pictures (94%), cover pictures (95%), and timeline photos (92%), relative frequencies differ little from each other. Only for pictures sent via a private message does the frequency decrease slightly. In this choice, only 83% know about the download possibilities. This distribution also remains stable with respect to the different age classes.

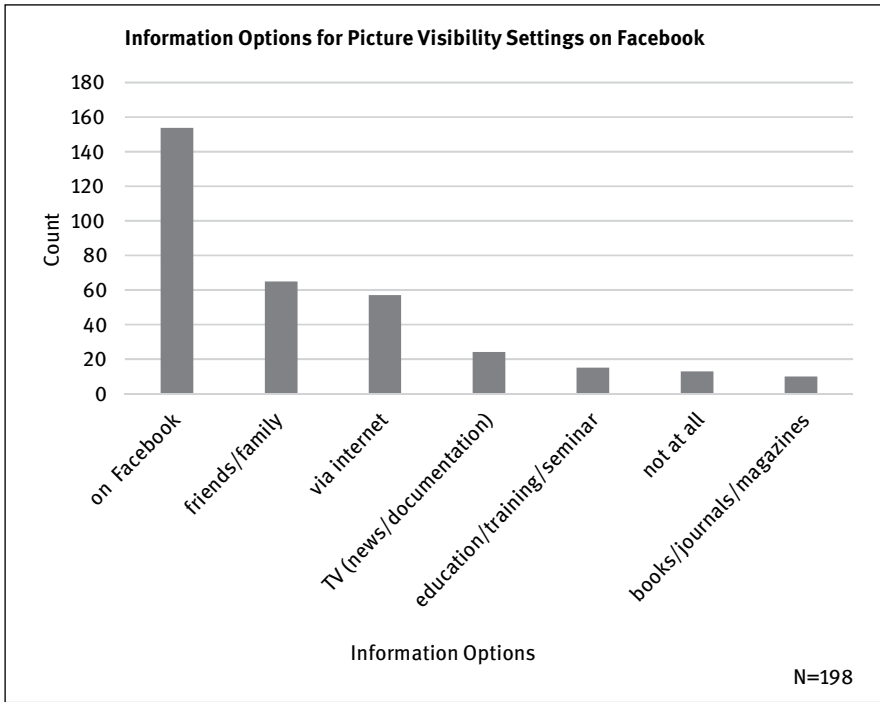


Figure 5: Sources of Information for Privacy Settings on Facebook.

RQ9: Are adolescent Facebook users aware of the possibilities to change their privacy settings?

Only 13 participants were not aware of the privacy settings Facebook offers to control published information. Of these participants, 154 received the information about privacy control from Facebook itself (see Figure 5). Privacy control was also discussed between friends and with family members, with 15 participants getting such information from school or education, training, or in a seminar. Obviously, this topic has not yet broadly arrived at schools.

RQ10: Does the willingness relating to sexting differentiate with regard to the age groups' self-presentation activity and their friends' use?

As discussed above, sexting refers to sending or receiving nude or seminude pictures (Lenhart, 2009, p. 3). All age groups behave very similarly concerning Sexiness (category 5). There are only around 3%–4% of teens who are willing to present themselves in a sexy posture in their profile pictures, cover pictures, or in their timeline. An acceptance of viewing others' Sexiness images, however, is

higher (between 11 % and 13 % for all age groups). For private messages, the story is different. In this case, 11 % of all teens send sexy photos to friends, and 23 % accept sexy photos from others in private messages.

Only 2 % of all participants state they send pictures in private messages showing themselves fully nude (regardless of whether their heads are cropped out of the image). Not a single teen admitted to behaving accordingly concerning all other picture types.

RQ11: Does the willingness related to sexting differentiate with regard to genders' self-presentation and their friends' use?

We believe it is striking that in nearly all cases, the tolerance for other users' photo choices in publications is higher than for one's own self-presentation of certain image types. Of the participants, 15 % of adolescent men would rather send pictures of themselves in boxer shorts than pictures in which they were either nude with head showing (6 %) or nude with head cropped (5 %). It is interesting to learn as well that 11 % of adolescent women (consequently, fewer than men) would rather send pictures of themselves in bikini. That 26 % of adolescent women would tolerate friends sending such pictures, however, is somewhat surprising. In contrast, only 16 % of boys would find it acceptable if friends sent pictures from the category Sexiness. In sum, women are more tolerant than men are regarding pictures expressing sexiness.

Discussion

Our research model with its six dimensions *User*, *Use*, *Privacy*, *Sexting*, *Picture Category*, and *Picture/Photo Publication Behavior* provides the possibility of evaluating photo publication behavior of adolescents (teens aged 13 to 20) on Facebook. It focuses on Facebook photo use in terms of both adolescent users' self-presentations as well as the behavior of their Facebook friends. Beyond that, privacy and sexting aspects are included. All dimensions were analyzed in total as well as by age and gender of the cohort.

With respect to the research model and the 11 RQs derived therefrom, we arrived at the following main results:

- Acceptance regarding photo publication behavior is generally higher for friends' usage than for one's own self-presentation.
- For profile pictures, adolescent Facebook users mostly prefer portraits. Pictures from the category No Person Depicted are most often preferred as cover pictures, but are followed closely by photos showing partying.

- Across all four picture categories – profile picture, cover picture, timeline, and private message – pictures showing nudity received the lowest approval rating. Adolescents predominantly do not want to use such pictures for themselves and also do not want to see them from/of their friends.
- About four-fifths of teens want their profile pictures to generate a positive image.
- The uploading rate of pictures is an irregular activity. When adolescents do get ready to publish images, they reflect on their content before uploading them to Facebook.
- Considering the privacy aspect, it is surprising that only 15 participants (7.6 %) received timely and pertinent information from the settings of school or education, training, or a seminar.
- Teens understand the images they upload – profile pictures (94 %), cover pictures (95 %), timeline pictures (92 %), and pictures in private messages (83 %) can be subsequently downloaded by other Facebook users.
- Contrary to expectations, this study did not find any conspicuous results for sexting behaviors related to age or gender.

These results are partly in line with some previous studies. Vanderhoven et al. (2014, p. 5) observed that the rate of risky pictures and videos being published is not very high. Due to the high rating for the nonuse in any mentioned area of the categories Naked – Head and Full Body, Naked – Without Head and Full Body, Sexiness, Alcohol Shown, Drug Use Shown and Nonverbal Aggression, we can confirm this result for adolescent Facebook users participating in our study as well.

Burkell et al. (2014, p. 980) pointed out their participants do reflect before they publish instead of deleting content later. But their survey sample comprised adults, not adolescents. We also determined our participants reflect on their pictures' content. Moreover, for the younger adult participants observed by Burkell et al. (2014) it is “essentially *de rigueur*” to post pictures that show alcohol consumption or partying. We must contradict this statement it is normal for teens to post pictures of themselves showing alcohol consumption. Comparing these other studies with our results, we can only confirm that partying pictures are posted at a moderately high frequency rate, but not photos showing an explicit relation to alcohol (or drugs). However, our respondents do demonstrate a higher tolerance for alcohol-depicting photos of other Facebook users. A possible explanation for this higher acceptance for friends' usage might be that viewers' feel little or no responsible for pictures uploaded by their friends.

Our study is limited to aspects of our research model. For further studies, it would be interesting to extend the model. Culture can influence self-presentation

(Kuo et al., 2013, p. 642) and acceptance of photos by others. Are there cultural differences (Baran & Stock, 2015b) regarding teens' photo publication and acceptance behavior? Do adolescent Facebook users from different cultures select the same types of photo categories for their self-presentations? We only considered the use of Facebook. Depending on the country, other SNSs are common. If we, for example, want to study teenagers' SNS behavior in Russia, we must analyze VKontakte, the domestic SNS (Baran & Stock, 2015a) for Russia, instead of Facebook.

Our approach is of a quantitative nature. It should be deepened by applying qualitative methods. For a better understanding of the photo publication behavior of adolescent SNS users, researchers should conduct personal interviews with young women and men from the different age groups.

References

- Baran, K. S., & Stock, W. G. (2015a). Facebook has been smacked down. The russian special way of sns: Vkontakte as a case study. In *Proceedings of the 2nd European Conference on Social Media (ECSM 2015), 9.-10. July 2015, Porto, Portugal, 2015* (pp. 574–582). Reading, UK: Academic Conferences and Publishing Limited.
- Baran, K. S., & Stock, W. G. (2015b). Acceptance and quality perceptions of social network standard and non-standard services in different cultures. In C. Stephanidis (Ed.), *HCI International 2015 – Posters' Extended Abstracts. HCI International 2015, Los Angeles, CA, USA, August 2–7, 2015. Proceedings Part II* (pp. 65–70). Chur, Switzerland: Springer (Communications in Computer and Information Science; 529).
- Beldad, A. D., & Koehorst, R. (2015). It's not about the risks, I'm just used to doing it: Disclosure of personal information on facebook among adolescent dutch users. In G. Meiselwitz (Ed.), *Social Computing and Social Media. 7th International Conference, SCSM 2015. Held as Part of HCI International 2015, Los Angeles, CA, USA, August 2–7, 2015, Proceedings* (pp. 185–195). Chur, Switzerland: Springer (Lecture Notes in Computer Science; 9182).
- Boyd, D., & Hargittai E. (2010). Facebook privacy settings: Who cares? *First Monday*, 15(8).
- Burkell, J., Fortier, A., Wong, L. L. Y. C., & Simpson, J. L. (2014). Facebook: Public space, or private space? *Information, Communication & Society*, 17(8), 974–985.
- Debatin, B., Lovejoy, J. P., Horn, A. K., & Hughes B. N. (2009). Facebook and online privacy: Attitudes, behaviors, and unintended consequences. *Journal of Computer-Mediated Communication*, 15(1), 83–108.
- DiMicco, J. M., & Millen, D. R. (2007). Identity management: multiple presentations of self in facebook. In *Proceedings of the 2007 International ACM Conference on Supporting Group Work* (pp. 383–386). New York, NY: ACM.
- Haferkamp, N., Eimler, S. C., Papadakis, A. M., & Kruck, J. V. (2012). Men are from mars, women are from venus? Examining gender differences in self-presentation on social networking sites. *Cyberpsychology, Behavior, and Social Networking*, 15(2), 91–98.

- Katzman, D. K. (2010). Sexting: Keeping teens safe and responsible in a technologically savvy world. *Paediatrics & Child Health*, 15(1), 41–42.
- Kuo, F. Y., Tseng, C. Y., Tseng, F. C., & Lin, C. S. (2013). A study of social information control affordances and gender difference in facebook self-presentation. *Cyberpsychology, Behavior, and Social Networking*, 16(9), 635–644.
- Lenhart, A. (2009). *Teens and sexting. How and why minor teens are sending sexually suggestive nude or nearly nude images via text messaging*. Washington, D.C.: Pew Internet & American Life Project.
- Livingstone, S., & Görzig, A. (2012). Sexting: the exchange of sexual messages online among european youth. In: S. Livingstone, L. Haddon, & A. Görzig (Eds.), *Children, Risk and Safety Online: Research and Policy Challenges in Comparative Perspective* (pp. 149–162). Bristol, UK: The Policy Press.
- Livingstone, S., Haddon, L., Görzig, A., & Ólafsson, K. (2011). *Risks and safety on the internet: The perspective of european children. Full findings*. London, UK: EU Kids Online Network.
- Madden, M., Lenhart, A., Cortesi, S., Gasser, U., Duggan, M., Smith, A., & Beaton, M. (2013). *Teens, social media, and privacy*. Washington, D.C.: Pew Research Center's Internet & American Life Project.
- McAndrew, F. T., & Jeong, H. S. (2012). Who does what on facebook? Age, sex, and relationship status as predictors of facebook use. *Computers in Human Behavior*, 28(6), 2359–2365.
- Mitchell, K. J., Finkelhor, D., Jones, L. M., & Wolak, J. (2012). Prevalence and characteristics of youth sexting: A national study. *Pediatrics*, 129(1), 13–20.
- Nadkarni, A., & Hofmann, S. G. (2012). Why do people use facebook? *Personality and Individual Differences*, 52(3), 243–249.
- Peluchette, J., & Karl, K. (2008). Social networking profiles: An examination of student attitudes regarding use and appropriateness of content. *CyberPsychology & Behavior*, 11(1), 95–97.
- Shelton, A., K., & Skalski, P. (2013). Blinded by the light: Illuminating the dark side of social network use through content analysis. *Computers in Human Behavior*, 33(1), 339–348.
- Statista (2015). *Number of monthly active facebook users worldwide as of 3rd quarter 2015 (in millions)*. Retrieved from <http://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>
- The National Campaign to Prevent Teen and Unplanned Pregnancy, & COSMO girl.com (2008). *Sex and tech. results from a survey of teens and young adults*. Washington, DC: The National Campaign to Prevent Teen and Unplanned Pregnancy.
- Tifferet, S., Gaziel, O., & Baram, Y. (2012). Guitar increases male facebook attractiveness: Preliminary support for the sexual selection theory of music. *Letters on Evolutionary Behavioral Science*, 3(1), 4–6.
- Vanderhoven, E., Schellens, T., Valcke, M., & Raes, A. (2014). How safe do teenagers behave on facebook? An observational study. *PLoS ONE*, 9(8), 1–9.
- Wang, S. S., Moon, S. I., Kwon, K. H., Evans, C. A., & Stefanone, M. A. (2010). Face off: Implications of visual cues on initiating friendship on facebook. *Computers in Human Behavior*, 26(2), 226–234.
- Wilson, R. E., Gosling, S. D., & Graham, L. T. (2012). A review of facebook research in the social sciences. *Perspectives on Psychological Science*, 7(3), 203–220.

Appendix

Creative Commons information for the used prototype pictures. Prototype picture numbers refer to the numbers in Figure 2. All pictures were downloaded from *flickr.com*.

Prototype Picture Number	Creative Commons Information
1	CC TheArches
2a	CC I woke Up Today
2b	CC Peter Burgess
3a	CC Nadja Tatar
3b	CC DLSimaging
4	CC Eleazar
5a	CC HotlantaVoyeur
5b	CC Richard Kang
8a	CC Nick Douglas
8b	CC Paula Fernande
9	CC Jade Nemy Leonard
10	Top left: CC [Duncan], Top right: CC Sam Howzit, Bottom left: CC Brian Neudorff, Bottom right: CC sneakerdog
11a	CC mckinney75402
11b	CC chloe delong