SUBJECTIVE NORM AND THE PRIVACY CALCULUS: EXPLAINING SELF-DISCLOSURE ON SOCIAL NETWORKING SITES

Jakob Wirth  
*University of Bamberg, jakob.wirth@uni-bamberg.de*

Christian Maier  
*University of Bamberg, christian.maier@uni-bamberg.de*

Sven Laumer  
*Friedrich-Alexander University Erlangen-Nuernberg, sven.laumer@fau.de*

Follow this and additional works at: [https://aisel.aisnet.org/ecis2019_rp](https://aisel.aisnet.org/ecis2019_rp)

Recommended Citation  
[https://aisel.aisnet.org/ecis2019_rp/131](https://aisel.aisnet.org/ecis2019_rp/131)

This material is brought to you by the ECIS 2019 Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in Research Papers by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
SUBJECTIVE NORM AND THE PRIVACY CALCULUS: EXPLAINING SELF-DISCLOSURE ON SOCIAL NETWORKING SITES

Research paper
Wirth, Jakob, University of Bamberg, Germany, jakob.wirth@uni-bamberg.de
Maier, Christian, University of Bamberg, Germany, christian.maier@uni-bamberg.de
Laumer, Sven, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany, sven.laumer@fau.de

Abstract
The privacy calculus postulates that individuals disclose information when benefits outweigh privacy risks. Despite its wide applicability, research has also challenged the privacy calculus. It was shown that individuals disclose information even if benefits do not outweigh privacy risks. Two explanations have been provided: On the one hand, perceptions might lead to a miscalculation of benefits and privacy risks. On the other hand, additional concepts might alter the effect of benefits and privacy risks on disclosure. In this research study we provide a third explanation: We suggest subjective norm to be a factor which overlies the effect of benefits and privacy risk. Subjective norm is the perceived social pressure of individuals that other important referents around expect the individual to undertake a certain behavior. To integrate subjective norm into the privacy calculus, we use the theory of reasoned action as our theoretical lens. Based on a survey with 1,466 participants and a covariance-based structural equation modeling (SEM) analysis, we can conclude that subjective norm has the strongest effect on disclosure. The results contribute to theory in the privacy domain, by questioning in how far the privacy calculus can be considered, without taking the environment into consideration.

Keywords: Theory of reasoned action, quantitative study, self-disclosure, subjective norm.

1 Introduction
Based on current knowledge, the disclosure of information on social networking sites (SNS) mainly depends on the risks and the benefits which result out of that disclosure (Dinev and Hart 2006). When individuals disclose information on SNS, their privacy can be violated but at the same time they receive benefits such as fun (Sun et al. 2015). If these benefits outweigh the privacy risks, then individuals are more likely disclose their information (Krasnova and Veltri 2011). The theory depicting this relationship, is called privacy calculus (Dinev and Hart 2006).

Despite that knowledge, we see that individuals also disclose information when privacy risks are high and benefits are low (Acquisti 2004; Dinev et al. 2015). Two explanations have been provided so far: First, there is a misperception of benefits and privacy risks (Acquisti 2004). Individuals think that benefits are high although they are actually low; at the same time, they consider privacy risks as low although the privacy risks are actually high. Second, the effect of benefits and privacy risks on disclosure is altered such that the effect of benefits is strengthened and the effect of privacy risks is weakened (Brakemeier et al. 2016a; Sarathy and Li 2007; Wirth et al. 2018).

However, research from other streams suggests that also additional factors might determine decisions individuals undertake (Fishbein and Ajzen 1975, 2010). This would go beyond the effects of benefits and privacy risks. One of the most important factors, influencing the decisions of individuals, is subjective norm. This represents the perception of an individual that other important referents around generally expect him to behave in a certain way (Fishbein and Ajzen 1975, 2010). For example, it was shown that
individuals are more likely pay to protect their privacy, when others, who are important to them, expect them to do so (Schreiner and Hess 2015). Also generally in the privacy domain, an effect of subjective norm, has already been indicated (Heirman et al. 2013).

Therefore, to better understand the privacy calculus as the dominant theory in privacy research (Smith et al. 2011), subjective norm needs to be included. Thereby, subjective norm might be one explanation that serves to better understand why individuals disclose information even if benefits do not outweigh privacy risks. So, we ask the following research question:

*What is the role of subjective norm on the privacy calculus in the domain of SNS?*

To answer the research question, we rely on the one hand on the privacy calculus. It has been applied in a variety of settings, among others, on SNS (Krasnova and Veltri 2011). In this study we focus on SNS, because on SNS much information is disclosed that potentially violates ones’ privacy (Biczók and Chia 2013). On the other hand, we apply the theory of reasoned action (TRA) (Fishbein and Ajzen 1975). TRA is a theory, usable to explain general behavior of individuals, based on their behavioural intention. Thereby, the TRA postulates that two main concepts influence the behavioural intention: The attitudes towards the particular behavior and the subjective norm. Attitudes towards the particular behavior is the evaluation and the strength of that evaluation towards the particular behavior. Subjective norm on the other hand is the social pressure individuals perceive by other individuals around (Ajzen and Fishbein 1980).

To research on the role of subjective norm in the privacy calculus, we use the TRA as a basis. Thereby, in line with previous research (Davis et al. 1989; Venkatesh et al. 2003), we theorize that beliefs are the direct determinants of behavioural intention, replacing general attitude. To do so, we integrate the beliefs – benefits and privacy risks – as well as subjective norm into one research model.

In the following, we provide information on the privacy calculus as well as on TRA and on subjective norm in particular. We then carve out the research gap which is that the role of subjective norm in the privacy calculus has not been considered by previous research. We continue with the creation of a research model. The research model has been tested with quantitative data from answers of 1,466 individuals. The results support two of three hypotheses. Afterwards, we discuss the results of the study. With doing so, we particularly contribute to theory by providing an explanation for why individuals disclose information, even if benefits might not outweigh privacy risks.

## 2 Theoretical Background

In the privacy domain, several theories have been used to explain disclosure, e.g. the communication privacy management theory (Metzger 2007), the social exchange theory (Choi et al. 2015) or the protection motivation theory (Wirth et al. 2017). However, we will on the one hand rely on the privacy calculus, since it is the most basic theory in privacy research which mainly explains disclosure of information (Smith et al. 2011). To include the subjective norm, we will discuss the privacy calculus in light of the TRA. In the following, we therefore first provide information on the TRA as well as on the privacy calculus. We then provide the results of a literature review, supporting our notion that there is a research gap on the inclusion of subjective norm into the privacy calculus.

### 2.1 Theory of Reasoned Action

The theory of reasoned action (TRA) is a theory that has widely been used in the IS domain and is probably the most known theory in the IS domain (Davis 1989). The TRA represents the basis for planned behavior which is dependent on the behavioural intention. Behavioural intention in turn is dependent on two influential concepts (see Figure 1): The attitudes towards the behavior and the subjective norm (Ajzen 1985; Fishbein and Ajzen 1975).

The attitudes towards behavior are defined as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour” (Eagly and Chaiken 1993, p. 1). The more favourable the particular entity is evaluated, the more positive the attitude is. Thereby, attitude is determined by the beliefs of the person about consequences when performing the behavior, related with the
evaluation of these consequences (Ajzen and Fishbein 1980; Fishbein and Ajzen 1975). Beliefs are defined as the individual’s subjective probability that performing the target behavior will result in a particular consequence (Davis 1989). The evaluation of the consequences can be negative or positive. In other words, the evaluation of the attitudes towards behavior are conducted by considering the perceived advantages and disadvantages of performing the behavior that is under consideration (Fishbein and Ajzen 1975). If the evaluation results in more advantages, the individual has a higher intention to behave in the particular way.

Although attitude towards behavior are rooted the TRA, several research studies have shown that beliefs have the strongest influence on behavioural intention via a direct influence. The attitude towards behavior is, if at all, only partially mediating the effect of beliefs on behavioural intention. Therefore, attitude towards behavior has often been disregarded (Venkatesh et al. 2003).

Subjective norm on the other hand is defined as “the subject’s perceptions in respect to what extent others want him to behave in a certain way or not” (Ajzen and Fishbein 1980, p. 57). Thereby, others are usually important others (Ajzen 1985), e.g. friends, family or co-workers. It is also considered to be an element of social influence and also often known as social pressure (Ajzen 2006). The higher the subjective norm of the individual, the more likely he is to intend to behave in the way it is expected by the other referents (Conner and Armitage 1998; Schepers and Wetzels 2007).

Thereby, subjective norm can be separated into two sub-concepts (Fishbein and Ajzen 1975). On the one hand, there are the normative beliefs. These represent the actual behavior, the individual beliefs, is being expected by the important others around. For example, a normative belief could be that an individual believes that important others expect him to disclose information on a particular SNS. On the other hand, there is the motivation to comply. This concept refers to, in how far the individual himself even wants to conduct the actions that he beliefs are expected by the other individuals around (Fishbein and Ajzen 1975). Although both concepts have been suggested to form subjective norm, it has repeatedly been shown that motivation to comply has only contributed little to nothing to understand intention and behavior. The reason is that usually individuals are motivated to comply with their important others. Hence, there is only little variance between normative beliefs and motivation to comply. Therefore, it is unnecessary to include motivation to comply, when researching on subjective norm (Fishbein and Ajzen 2010). In line with previous research, we will therefore also not include motivation to comply. With this, we also will not focus on the combination of normative beliefs and subjective norm. Instead, we will use the standard term subjective norm (Fishbein and Ajzen 2010) as it is common when researching on subjective norm (Fishbein and Ajzen 2010; Venkatesh et al. 2003).

Subjective norm also needs to be separated from other, similar constructs which are herding behavior and network externality (Sun 2013). Herding behavior is when a person follows another person to adopt a technology, whereas network externality refers to that the value of a technology increases when the number of users increases. Information for both, herding behavior and network externality, are usually
inferred through observation or direct communications, whereas subjective norm refers to the perceptions of the individual. Although there are exceptions, where e.g. also network externality is measured through perceptions (Keith et al. 2016), subjective norm is still different from both concepts. This is because it is neither about following another person nor about the number of other individuals but more about the perception of an individual what he thinks that other individuals want him to do (Ajzen and Fishbein 1980). Since we will use the TRA which includes subjective norm, we will also focus on subjective norm in this study.

In sum, the TRA provides a framework to understand the effect of attitudes towards behavior and the effect of subjective norm on behavioural intention. Based on this intention, actual behavior is then conducted. The TRA has already been applied in several contexts, e.g. technology acceptance research (Davis 1989), and also in the context of privacy (Bansal et al. 2016). To investigate the role of subjective norm in the privacy calculus, we will integrate the privacy calculus into the TRA.

2.2 The Privacy Calculus

Privacy is defined as having the control over ones’ personal information (Bélanger and Crossler 2011). Disclosing information leads to potentially losing control whereas disclosure is defined as revealing personal information to another party (Wakefield 2013). The intention to disclose is based on the privacy calculus (see Figure 2), one of the most used theories in privacy research (Dinev and Hart 2006; Wirth 2018).

The privacy calculus includes on the one hand benefits of disclosure. They represent all positive outcomes of disclosure (Dinev and Hart 2006). In the context of SNS, perceived enjoyment or perceived usefulness is often used as an equivalent to benefits (Krasnova et al. 2012; Lin and Lu 2011; Sun et al. 2015; Wakefield 2013). On the other hand, disclosure of information entails risks to ones’ privacy. Privacy risks in a SNS context (Krasnova et al. 2012) would then be the perception of an individual about the probability that a threat occurs, e.g. information is used inappropriately, and its adverse consequences, e.g. identity theft (Dinev 2014).

![The privacy calculus](image_url)

Based on the privacy calculus, individuals perform a weighing of benefits and privacy risks, which are related to the disclosure of information. To express that from a model-driven point of view, benefits have a positive effect and privacy risks have a negative effect on intention to disclose. If benefits, which relate to positive outcomes are at least as high as privacy risks, which relate to negative outcomes, then maximization of positive outcomes is fulfilled, and individuals have a higher intention to disclose. That is because individuals generally try to minimize negative and to maximize positive outcomes, such as benefits (van Eerde and Thierry 1996; Vroom 1964).

However, although the privacy calculus has been proven in many settings (Anderson and Agarwal 2011; Kehr et al. 2015; Xu et al. 2009), it was shown that the privacy calculus does not always hold true. In several cases, individuals disclose information although benefits do not outweigh privacy risks (Acquisti 2004; Dinev et al. 2015). Reasons that have been provided so far relate to the alteration of the perception...
(Acquisti 2004). Here, individual’s perception of benefits and privacy risks is altered such that they believe benefits are high although they are objectively low and vice versa for privacy risks. Another reason refers to altering the effect: Several concepts strengthen the effect of benefits and at the same time weaken the effect of privacy risks on disclosure (Brakemeier et al. 2016a; Sarathy and Li 2007; Wirth et al. 2018). A third reason might be that the effect of benefits and privacy risks on disclosure are overlaid by a third concept.

TRA suggests that subjective norm generally influences the decisions of individuals (Fishbein and Ajzen 2010). Subjective norm therefore might overlie the effect of benefits and privacy risks on disclosure. Therefore, in this research study we use TRA to integrate subjective norm into the privacy calculus. To find out, in how far subjective norm has already been applied in the privacy domain, we conducted a literature review.

2.3 Research Gap

Our literature review\(^1\) reveals that several studies in the field of privacy have already researched on the effect of subjective norm on different outcome variables (see Table 1).

<table>
<thead>
<tr>
<th>Content of the study</th>
<th>Different to this study because</th>
<th>Context</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect of subjective norm on behavior</td>
<td>Different dependent variable: measurement of password management</td>
<td>SNS</td>
<td>Dincelli and Goel 2017</td>
</tr>
<tr>
<td>Effect of subjective norm on intention</td>
<td>No integration of the privacy calculus</td>
<td>e-commerce</td>
<td>Heirman et al. 2013</td>
</tr>
<tr>
<td>Moderating effect of subjective norm</td>
<td>No effect of subjective norm on disclosure</td>
<td>Personal health records</td>
<td>Li and Slee 2014</td>
</tr>
<tr>
<td>Effect of subjective norm on intention</td>
<td>Different dependent variable: intention to use</td>
<td>SNS</td>
<td>Qin et al. 2016</td>
</tr>
<tr>
<td>Effect of subjective norm on trust</td>
<td>No effect of subjective norm on disclosure</td>
<td>SNS</td>
<td>Salehan et al. 2013</td>
</tr>
<tr>
<td>Effect of subjective norm on intention</td>
<td>Different dependent variable: willingness to pay</td>
<td>SNS</td>
<td>Schreiner and Hess 2015</td>
</tr>
<tr>
<td>Effect of subjective norm on intention</td>
<td>No integration of the privacy calculus Measurement was disclosure of others information</td>
<td>SNS</td>
<td>van Gool et al. 2015</td>
</tr>
<tr>
<td>Effect of subjective norm on privacy concerns</td>
<td>No effect of subjective norm on disclosure</td>
<td>SNS</td>
<td>Xu et al. 2013</td>
</tr>
</tbody>
</table>

Table 1. Literature review on subjective norm in the domain of privacy\(^1\)

However, several studies have considered intention to use as their dependent variable instead of intention to disclose (Beldad and Citra Kusumadewi 2015; Qin et al. 2016). Research has shown that both concepts are similar, but they are conceptually still different (Brakemeier et al. 2016b). In particular, disclosure is more central about the actual act of revealing information. On the other hand, usage is more about the functionalities of the technology and how to employ them. Thereby, disclosure is only considered as a subordinate aspect. This then also leads to different antecedents of disclosure and usage (Brakemeier et al. 2016b). Especially on SNS, where individuals can also just use SNS by viewing content rather than disclosing own content, the difference between usage and disclosure might become important.

Other studies also researched on other outcome variables, such as willingness to pay (Schreiner and Hess 2015) or management of passwords (Dincelli and Goel 2017). Another set of studies did not research on the direct effect of subjective norm on disclosure but used mediators such as trust (Salehan et al. 2013) or privacy concerns (Xu et al. 2013). Finally, studies which did research on the effect of subjective norm on disclosure did not take into account the privacy calculus (Heirman et al. 2013; van Gool

\(^1\) The literature review was conducted in the entire AIS eLibrary and the entire EBSCO Business Host. Used keywords were privacy (abstract) and subjective norm (full text).
et al. 2015). Although the effect of subjective norm on disclosure could be confirmed, leaving out the concepts of the privacy calculus does not answer in how far subjective norm also applies in such a setting. Besides, none of the other studies did take into account the privacy calculus. In sum, only a minority of studies has been researching on the effect of subjective norm on disclosure. None of the studies has included the privacy calculus. Therefore, there is a research gap in current research, regarding the role of subjective norm when applying the privacy calculus. Hence, in the following, we will use TRA to discuss the role of subjective norm in the privacy calculus.

3 Research Model

To research on the effect of subjective norm in the context of the privacy calculus, we have created a research model (see Figure 3).

![Figure 3. Research model](image)

The research model is based on an integration of the privacy calculus into the TRA. As explained in the previous subsections, beliefs have a stronger impact on behavioural intention directly than when mediated through attitude. Therefore, in line with previous research (Davis et al. 1989; Venkatesh et al. 2003), leaving out attitude and hypothesizing the effect of beliefs on behavioural intention is recommended. Therefore, we will hypothesize the effects of benefits and privacy risks on the outcome variable as well as the effect of subjective norm on the outcome variable. As our outcome variable, we have chosen self-disclosure. This is very common in SNS research in the domain of privacy (Krasnova et al. 2012; Krasnova and Veltri 2010; Mousavizadeh and Kim 2015). Self-disclosure refers to the amount of information an individual has shared on a SNS. In addition, we control for age and gender as it is common in privacy research (Jiang et al. 2013; Malhotra et al. 2004; Sun et al. 2015). In the following, the hypotheses are crafted.

Disclosure of information on can lead to several benefits. For example, fun or perceived usefulness (Sun et al. 2015). Individuals try to maximize these benefits and to minimize negative outcomes (van Eerde and Thierry 1996; Vroom 1964). Therefore, individuals who consider certain benefits to occur when disclosing information, increase their intention to disclose information to gain such benefits. This is also the case in the context of SNS, where benefits relate to fun and perceived usefulness, which can be gained when disclosing information (Krasnova and Veltri 2010; Sun et al. 2015). In line with previous research (Dinev and Hart 2006), we hypothesize:

**H1: The higher the benefits, the higher the self-disclosure.**

Besides possible benefits, disclosure of information can also lead to several privacy risks. Individuals rate privacy risks as the probability of a threat and its adverse consequences (Cox 2008). Individuals try to avoid these risks, to minimize the potential adverse consequences (van Eerde and Thierry 1996; Vroom 1964). As these privacy risks relate to the disclosure of information, individuals, who are facing
privacy risks, lower the intention to disclose information to avoid the subsequent privacy risks. Especially on SNS, individuals face several privacy risks such as possible identity theft (Dinev 2014). In line with previous research (Dinev and Hart 2006), we hypothesize:

\[ H2: \text{The higher the privacy risks, the lower the self-disclosure.} \]

Individuals, who have the perception of a high subjective norm think that other individuals around, who are important to them, expect the individual to conduct the certain behavior (Ajzen 1985; Ajzen and Fishbein 1980; Fishbein and Ajzen 1975). Usually, individuals tend to comply with their perceived expectation of important others to conduct the behavior (Cialdini and Goldstein 2004; Fishbein and Ajzen 2010; Kandel 1978). They do so because they hope to be considered more favourably by these important others (Moore and Benbasat 1991). Another reason is that they think, if other individuals expect them to do so, that behavior will be seen appropriate by these other important referents (Triandis 1980). Therefore, they are more likely to do what other important referents around expect them to do. In this study, the behavior under consideration is the self-disclosure of information. For example, an individual might have the perception that important others expect him to disclose information on a particular SNS. To be seen more favourably and to be considered more appropriate by these important others, the individual will be more likely to disclose the information on the SNS. Therefore, in line with previous research (Heirman et al. 2013; van Gool et al. 2015), we hypothesize:

\[ H3: \text{The higher the subjective norm, the higher the self-disclosure.} \]

To evaluate the research model, we have conducted a quantitative study. The methodology is presented in the following.

4 Methodology

In this research study, we aim to identify the role of subjective norm in the privacy calculus. To do so, we have created a research model that will be evaluated by quantitative data that was collected through a survey.

4.1 Setting up the survey

We set up the survey, using standardized, already validated reflective items from previous research (see Table 6 in the appendix). As the outcome variable, we used self-disclosure, which is grounded in the privacy calculus. Self-disclosure is a behavioral variable, reflecting the amount of information disclosed in a retrospective way (Krasnova et al. 2012). The survey was conducted in the context of SNS such that the items were slightly adapted to that context. To make sure that everybody has the same understanding of SNS, we gave several examples of SNS such as Facebook or Twitter, at the beginning of the survey. Using at least one SNS was a prerequisite to take part in the survey. Therefore, participants who answered that they currently do not use any SNS, were dismissed from the survey. The survey was online for one week. To facilitate a higher number of participants, we also raffled three Amazon vouchers among all participants.

The survey was structured as follows: we first asked demographic questions which include age and gender. We then continued with information about SNS and questions about benefits, privacy risks, subjective norm, and self-disclosure.

4.2 Implementation of the Survey and Demographics

To find participants to take part in our study, we posted the survey on an Instagram profile of a German female individual. This Instagram profile has about 25,700 followers at the time of the survey. Individuals who followed that profile, were then informed that a survey was conducted by our university. A link was provided where individuals could click on to take part in the survey. The questions in the survey...
were mandatory which is why we only received answers without missing values. All in all, 1,466 participants fully answered the survey. Since the survey was posted on a German profile, we translated the items into German, to make the survey more attractive for the followers of the Instagram profile. Since no missing values were present and the standard deviation for every data entry was above 0.5, we did not remove further data entries. The demographics of the remaining participants are depicted in Table 2. To analyze the data, we conducted a covariance-based approach, using the software AMOS 25. Due to the used items, and the relatively big number of data points, structural equation modeling via a covariance-based approach seemed to be sensible.

<table>
<thead>
<tr>
<th>Gender (Mean: 1.95, Sd: 0.22)</th>
<th>Male</th>
<th>5.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>94.6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (Mean: 19.75, Sd: 5.09)</th>
<th>&lt;16</th>
<th>4.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-17</td>
<td>21.9</td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>66.6</td>
<td></td>
</tr>
<tr>
<td>25-34</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>35-44</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>45-54</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>&gt;54</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Demographics of the remaining participants after cleaning data in percent

5 Results

To analyze the results, we first checked on a possible common method bias (CMB). We then proceed with the measurement model, to check on in how far the model is valid and reliable. Afterwards, we consider in how far the hypotheses are supported by our data.

5.1 Common method bias

To account for CMB, we performed several calculations: First, the we evaluated the bivariate correlations since only “extremely high correlations” (Pavlou et al. 2007, p. 122) would result in CMB. As outlined in Table 4, this is not the case in this study, since all correlations are far below 0.9. Second, we applied the popular Harman’s Single-Factor Test. This test shows that only 26.81 percent of variance is explained by one factor which is below the threshold of 50.0 percent. Third, we included a method factor including all indicators of all other constructs. This construct was then linked with all other constructs. The newly created model is then tested. This approach is known as the unmeasured latent method construct (ULMC) (Liang et al. 2007). The results show that the unmeasured latent method construct explains a delta of $R^2$ of 0.1. As the average $R^2$ without the CMB is 0.737, we have an increase by 0.14 percent. All three tests therefore show no signs of CMB.

5.2 Measurement model

As an initial validity check, we conducted an exploratory factor analysis (EFA), running a promax rotation with SPSS 25, excluding age and gender. As expected, the analysis of the pattern matrix reveals that all items are grouped into four factors. In particular, each item was loaded with at least 0.8 on the particular construct, except for one item of benefits, which only loaded with 0.508. Therefore, the EFA successfully shows that most indicators are loading on the correct corresponding construct.

We then proceeded with a confirmatory factor analysis (CFA), conducting a maximum likelihood approach, using AMOS 25. The CFA reveals that all indicator loadings, except for one item of benefits, exceed the recommended value of 0.707 (Carmines and Zeller 2008). This is the same item that was already below the value of 0.8 in the EFA. We therefore removed that item from the further analysis.

To evaluate the overall model fit of the CFA, we evaluate the chi-square, normalized by degrees of freedom. Furthermore, it is recommended to evaluate the comparative fit index (CFI), the standardized
root mean square (SRMR) as well as the root mean square error of approximation (RSMR) (Hu and Bentler 1999). Please see Table 3 for the results of our study, which reveal a good fit of our CFA model.

<table>
<thead>
<tr>
<th>Fit index</th>
<th>Value</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFI</td>
<td>0.996</td>
<td>&gt;0.95 (Hu and Bentler 1999)</td>
</tr>
<tr>
<td>SRMR</td>
<td>0.021</td>
<td>&lt;0.08 (Hu and Bentler 1999)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.028</td>
<td>&lt;0.06 (Hu and Bentler 1999)</td>
</tr>
<tr>
<td>X²/df</td>
<td>2.132</td>
<td>&lt;3 (Hair 2010)</td>
</tr>
<tr>
<td>NFI</td>
<td>0.987</td>
<td>&gt;0.9 (Bentler 1990)</td>
</tr>
</tbody>
</table>

Table 3. Fit indices of the confirmatory factor analysis

To establish convergent validity, three criteria must be met (Fornell and Larcker 1981): 1) All indicators’ loadings should be significant and exceed the recommended value of 0.707 (Carmines and Zeller 2008). This is the case as depicted in Table 6. As described earlier, one item of benefits was removed due to its low loading. 2) The construct reliabilities (CR) of all constructs should exceed the value of 0.8. Again, this is the case as depicted in Table 4. In addition, the average variance extracted (AVE) should be greater than 0.5 which is also the case in our study (see Table 4). Furthermore, values for Cronbach’s alpha all exceed the recommended value of 0.7 (see Table 6).

To establish discriminant validity, i.e. making sure that the constructs differ from each other, the square root of the AVE needs to be greater than the correlation of the constructs with each other (Fornell and Larcker 1981). Again, this is the case in our study as depicted in Table 4. To further establish discriminant validity, we also relied on the heterotrait-monotrait ratio (HTMT). Using the most conservative approach HTMT<0.85 we do not see any sign of discriminant validity since the highest value is between age and gender with 0.500.

Table 4. AVE, CR and cross loadings

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>SD</th>
<th>AVE</th>
<th>CR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Benefits</td>
<td>5.21</td>
<td>1.03</td>
<td>0.848</td>
<td>0.920</td>
<td>0.921</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Privacy risks</td>
<td>5.59</td>
<td>1.28</td>
<td>0.840</td>
<td>0.940</td>
<td>-0.042</td>
<td>0.917</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Subjective norm</td>
<td>2.85</td>
<td>1.69</td>
<td>0.765</td>
<td>0.907</td>
<td>0.118</td>
<td>-0.003</td>
<td>0.875</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Self-disclosure</td>
<td>2.94</td>
<td>1.67</td>
<td>0.733</td>
<td>0.892</td>
<td>0.252</td>
<td>-0.054</td>
<td>0.288</td>
<td>0.856</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Age</td>
<td>19.75</td>
<td>5.09</td>
<td>n/a</td>
<td>n/a</td>
<td>-0.212</td>
<td>0.119</td>
<td>-0.047</td>
<td>-0.104</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>6 Gender</td>
<td>1.95</td>
<td>0.22</td>
<td>n/a</td>
<td>n/a</td>
<td>0.140</td>
<td>-0.094</td>
<td>0.048</td>
<td>0.006</td>
<td>-0.500</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Note: Square root of AVE (bold) is listed on the diagonal of bivariate correlations. n/a cannot be evaluated because these constructs are single-item constructs. All items were measured on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7).

Overall, we conclude that our measurement model is valid. We therefore next test the hypotheses.

5.3 Hypotheses testing

To test the hypotheses, we created a structural model in AMOS 25. The results are presented in Figure 4. Overall, two out of three hypotheses were supported.

In particular, the results support hypothesis H1 and hypothesis H3. That means that benefits as well as subjective norm have a positive effect on self-disclosure. Hypothesis H2 is not supported, i.e. privacy risks has no effect on self-disclosure. Besides, both control variables influence self-disclosure, however, their path coefficient is rather low (Cohen 1988). All in all, all variables explain 18.6 percent of the variance of self-disclosure with control variables. Solely taking only the control variables, excluding benefits, privacy risks and subjective norm, then 1.5 percent of the variance of self-disclosure is explained.
To better depict the effect of subjective norm on self-disclosure, we also calculated the $f^2$ values (Cohen 1988). With the $f^2$ value, the predictive power of each construct to explain the dependent variable can be calculated. The results are depicted in Table 5. The results show that leaving out subjective norm, reduces the $R^2$ stronger, than when leaving out both, benefits and privacy risks. Furthermore, although the $R^2$ of benefits and subjective norm are both weak (Cohen 1988), the $f^2$ value of subjective norm is still stronger. Furthermore, the $f^2$ value of privacy risks is non-existent, i.e. privacy risks only adds marginal power to explain self-disclosure.

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>$R^2$ without antecedent</th>
<th>$f^2$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>12.6 percent</td>
<td>0.07 (weak)</td>
</tr>
<tr>
<td>Privacy risks</td>
<td>18.4 percent</td>
<td>0.00 (non-existent)</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>9.8 percent</td>
<td>0.11 (weak)</td>
</tr>
<tr>
<td>Age</td>
<td>18.2 percent</td>
<td>0.00 (non-existent)</td>
</tr>
<tr>
<td>Gender</td>
<td>18.0 percent</td>
<td>0.01 (non-existent)</td>
</tr>
</tbody>
</table>

$>0.35 = $strong; $>0.15 = $medium; $>0.02 = $weak; $<0.02 = $non-existent (Cohen 1988)

Table 5. $f^2$ values of the independent variables on self-disclosure as the dependent variable

5.4 Limitations

These results are limited by some issues. First, the majority of the individuals in this research study are women with the age between 18 and 24. Although, in comparison to this study, previous studies have indicated no effects of gender and age on self-disclosure (Cho 2007; Krasnova et al. 2012; Wagner et al. 2018), we also found a very slight effect of age and gender on self-disclosure. We therefore postulate that our results can only be generalized to the young female population in the first place. However, due to the many studies not finding a difference in self-disclosure, depending on age and gender, more research on that issue is necessary.

Second, this research study has been conducted in a SNS setting where subjective norm might be especially important (Heirman et al. 2013). Hence, our results are also only generalizable to the SNS domain. Future research might also conduct research on the effect of subjective norm on self-disclosure in other settings, such as e-commerce.

Third, we only rely on self-disclosure as a retrospective behavioral variable and not on actual, observable behavior. Although this is common when researching on the privacy calculus (Krasnova et al. 2012; Krasnova and Veltri 2010), researching on actual behavior would have been led to deeper insights.
Besides these limitations, our study still contributes to theory and practice which will be discussed next.

6 Discussion

The privacy calculus is the most used theory in privacy research (Dinev et al. 2015; Smith et al. 2011). However, it has also been challenged, because it was shown that individuals also disclose information even if benefits do not outweigh privacy risks (Acquisti 2004; Dinev et al. 2015). Possible explanations that have been provided so far either relate to the alteration of the perception of benefits and privacy risks (Acquisti 2004) or the alteration of the strength of the effect of benefits and privacy risks on disclosure (Brakemeier et al. 2016a; Sarathy and Li 2007; Wirth et al. 2018).

In this study, we research on an additional explanation which is that another concept overlies the effects of benefits and privacy risks on disclosure. Based on TRA, we postulated that subjective norm could be that concept. Subjective norm is the perceived social pressure of individuals in respect to what one believes other important referents around expect one to do (Ajzen and Fishbein 1980). Since there was a research gap on that issue in privacy research, we included subjective norm into the privacy calculus. The results support two of our three hypotheses. The non-supported hypothesis of privacy risks on the outcome variables has also already been observed in privacy research (Alashoor et al. 2018). One reason could be, that on SNS, users have lower risk perceptions and are thus less concerned about potential risks resulting out of misuse of their personal information (Fogel and Nehmad 2009). Another explanation might be that self-disclosure is a more complex concept than it is currently treated (Dienlin and Trepte 2015). Therefore, more research on that non-significant effect is necessary.

In addition, there are significant effects of both control variables: The older the individuals are, the less likely they will self-disclose their information. Also, the negative gender-effect suggests that females are less likely to self-disclose information than men. However, both effects need to be considered with caution since the effect size is very low and many other studies have revealed non-significant effects here (Cho 2007; Krasnova et al. 2012; Wagner et al. 2018).

Besides, with our results, we answer the research question which is about the role of the subjective norm in the privacy calculus. Our results indicate that subjective norm has, compared to benefits and privacy risks, the strongest effect on self-disclosure in the privacy calculus. With these results we contribute to theory and practice by the following:

Additional concepts influence self-disclosure beyond privacy risks and benefits. Previous research has challenged the privacy calculus, showing that individuals disclose information even if benefits do not outweigh privacy risks (Acquisti 2004; Dinev et al. 2015). Reasons that have been mentioned either lie in a misperception of benefits and privacy risks (Acquisti 2004) or an alteration of the effect of benefits and privacy risks on self-disclosure (Brakemeier et al. 2016a; Sarathy and Li 2007; Wirth et al. 2018). In this study, we researched on a third reasons. In particular, we included subjective norm as an additional variable that does neither influence benefits or privacy risks nor its effect. Rather the concept overlies the effects of benefits and privacy risks on self-disclosure. With this result, we contribute to privacy research by suggesting that besides the existing factors explaining the privacy calculus, also other factors might be important to explain self-disclosure.

Subjective norm has the strongest effect on self-disclosure. Our results support our hypothesis such that subjective norm has a strong positive effect on self-disclosure. Subjective norm is a concept that takes into account not only the perceptions that refer to the individual himself but also the perceptions that refer to other individuals (Ajzen and Fishbein 1980; Fishbein and Ajzen 1975). In particular, the individual thinks about what other individuals around expect him to do. Based on our results, this expectation is more important than privacy risks and benefits that refer to the individual himself. With this result, we contribute to privacy research, by suggesting that individuals might less think about what is good (benefits) or bad (privacy risks) for them. Rather they rely on the opinion of important others when making their decision to self-disclose. Future research can rely on these results to less focus on perceptions that refer to the individual himself but rather rely to other factors that refer to their important referents in their environment. Considering the other individuals around, the individual who is disclosing
information, has also already been part of recent research (Wagner et al. 2018; Wirth et al. forthcoming). However, more research on this topic is necessary, e.g. by applying it to models such as the antecedents – privacy concerns – outcomes (APCO) model (Smith et al. 2011) or the privacy paradox (Norberg et al. 2007) which is that individuals disclose information despite being concerned about their privacy.

Besides these theoretical implications, we also provide two practical implications.

**SNS providers might not focus on benefits and privacy risks of their SNS but rather persuade individuals that other individuals around want them to disclose information.** Organizations, which provide SNS, rely on individuals to self-disclose information. Without such information, the SNS would not be functionable. Based on previous research, the main way to make individuals disclose information, would be to either to decrease privacy risks or to increase benefits (Dinev and Hart 2006). This might be correct but based on our research what is more important is what other individuals around expect the individual to do. One way could be to increase subjective norm of the individuals. For example, a SNS provider might draw a users’ attention to conversations of friends of this user on the SNS. The user might then feel a higher social pressure to join this conversation because she thinks that her friends expect him to do so.

**Individuals should be aware of the effect of subjective norm and might focus on benefits and privacy risks of disclosure.** Besides organizations who want individuals to disclose as much information as possible, there are the individuals who want to maintain their privacy and gain as much benefits as possible. These individuals should be aware of that their self-disclosure might mainly be driven by their subjective norm. Being aware of that might help them to decrease that effect of subjective norm and more focus on privacy risks and benefits to base their decision on these two concepts.

## 7 Future Research and Conclusion

Based on our results, we suggest several ways for future research. First, in this study we operationalize subjective norm by referring to referents who are important to the particular individual. However, important referents might have a different effect on the individual (Granovetter 1973) as has also already been shown in previous privacy research (Petronio and Altman 2002). A fruitful future research agenda therefore might be to distinguish the effect of subjective norm depending on who that important referent is. Distinguishing could e.g. be done by the level of strength of tie between both individuals or by the level of expertise of the important other in the domain of the focal behavior.

Second, interaction-effects between the independent variables might increase the understanding of the effect of subjective norm on the privacy calculus. For example, one could research on in how far subjective norm also serves as an antecedent of benefits and privacy risks. Although not tested, one might assume that the higher the subjective norm the higher the perception of benefits. Future research could thus build on this research path and try to find out in how far such interaction effects exist. In this vein, future research could also include other similar concepts, such as herding behavior or network externalities, to then research on, which concept is best in explaining disclosure of information on SNS.

Third, in this study we use self-disclosure as the outcome variable. This variable is a retrospective behavioral variable (Alashoor et al. 2016). We did so because in privacy-research exists an intention-behavior gap (Smith et al. 2011) that has also been observed in other research areas (Polites et al. 2018). With focusing on self-disclosure, we overcame this issue and focused directly on the retrospective behavior of the participants. This is also in line with the TRA because behavior is directly determined by intention. However, to more focus on the basic concepts of the TRA, future research could try to include both – intention and actual, observable behavior – to on one the one hand still be able to report actual behavior but on the other hand also even more focus on the TRA.

In sum, in this research study, we integrated the privacy calculus into the TRA. Thereby, we presented subjective norm to be an additional concept determining self-disclosure besides privacy risks and benefits. After having conducted a study with 1,466 participants, the results support two of three hypotheses, whereupon subjective norm influences self-disclosure. Especially, subjective norm has an even stronger effect on self-disclosure as the previously studied beliefs privacy risk and benefits. With our results, we
contribute to theory among others, by providing an additional explanation for why individuals disclose information even if benefits might not outweigh privacy risks.

8 Appendix

<table>
<thead>
<tr>
<th>Construct</th>
<th>Indicators</th>
<th>Loading</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>I have fun on social networking sites.</td>
<td>0.844</td>
<td>Krasnova and Veltri 2010</td>
</tr>
<tr>
<td>(Cronbachs α: 0.821)</td>
<td>I spend enjoyable and relaxing time on social networking sites.</td>
<td>0.824</td>
<td></td>
</tr>
<tr>
<td>Privacy risks</td>
<td>When disclosing information on social networking sites …</td>
<td>0.857</td>
<td>Dinev and Hart 2006</td>
</tr>
<tr>
<td>(Cronbachs α: 0.905)</td>
<td>… then my personal information could be sold to third parties</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>… then my personal information could be misused.</td>
<td>0.934</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… then my personal information could be made available to unknown individuals or companies without my knowledge.</td>
<td>0.828</td>
<td></td>
</tr>
<tr>
<td>Subjective norm</td>
<td>People who are important to me expect me …</td>
<td>0.774</td>
<td>Venkatesh and Davis 2000</td>
</tr>
<tr>
<td>(Cronbachs α: 0.850)</td>
<td>… to disclose news on social networking sites.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>… to have a profile on social networking sites.</td>
<td>0.744</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… to share photos on social networking sites.</td>
<td>0.913</td>
<td></td>
</tr>
<tr>
<td>Self-disclosure</td>
<td>I have a comprehensive profile on social networking sites.</td>
<td>0.743</td>
<td>Gerlach et al. 2015; Krasnova and Veltri 2010</td>
</tr>
<tr>
<td>(Cronbachs α: 0.818)</td>
<td>I save a lot of information that characterize me as a person truthfully on social networking sites.</td>
<td>0.793</td>
<td></td>
</tr>
<tr>
<td></td>
<td>On social networking sites I create a detailed profile of myself.</td>
<td>0.789</td>
<td></td>
</tr>
</tbody>
</table>

All items were measured on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7)

Table 6. Constructs, indicators, loadings and Cronbachs Alpha

References


