Strength of Ties as an Antecedent of Privacy Concerns: A Qualitative Research Study

Full Paper

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Abstract

Previous research has indicated that the relationship between individuals might influence privacy concerns of individuals. In particular, the tie strength between the individual who is about to disclose information (discloser) and the individual who is potentially receiving the information (potential co-owner), might determine privacy concerns of the discloser. The discloser and the potential co-owner might be tied up strongly, weakly or not at all. We set up a qualitative research study, asking disclosers in how far tie strength determines their privacy concerns. The results prove that weak ties mainly increase privacy concerns of disclosers, whereas strong and absent ties mainly only increase privacy concerns in certain situations. We therefore contribute to the under-researched field of antecedents of privacy concerns by presenting strength of tie as an additional antecedent.

Keywords

Privacy concerns, strength of weak ties, qualitative method, communication privacy management theory

Introduction

Previous surveys indicate that individuals seem to be little concerned that their privacy is threatened through mass surveillance by governmental agencies (Rainie and Madden 2015). But personal experience indicates that individuals seem to be much concerned about their privacy as soon as someone they can physically see is about to threat their privacy (Greenwald 2014).

This anecdotal evidence therefore suggests that privacy concerns of the discloser, i.e. the individual who is providing information, are somehow dependent on the potential co-owner, i.e. the individual who is gaining access to the disclosed information (Petronio and Altman 2002; Stanton and Stam 2002). In particular, it seems to be dependent on the relationship between both parties, i.e. how strongly they are tied up with each other (Granovetter 1973; Xu et al. 2011) whereas one is less tied up with a governmental agency and more tied up with someone one can physically see.

From a theoretical perspective, concerns in relation to privacy are typically expressed by privacy concerns (Bélanger and Crossler 2011; Smith et al. 2011), reflecting worries about the threat to ones' privacy (Son and Kim 2008). Research has shown that privacy concerns are a significant construct and often also serve as a proxy for privacy (Dinev et al. 2012). Hence, understanding how privacy concerns are formed is crucial to better understand privacy in its whole. However, why individuals develop privacy concerns is largely under-researched in comparison to in how far privacy concerns cause reactions (Smith et al. 2011). Previous research in turn suggests that for example, privacy concerns depend on how strongly the discloser and the potential co-owner are tied up with each other (Stanton and Stam 2002; Xu et al. 2011). However, there is no empirical study proving that dependence. We therefore contribute to the research area of privacy by providing the strength of tie between the discloser and the potential co-owner as an antecedent of privacy concerns to better being able to explain privacy concerns. We therefore ask the following research question:

In how far does the tie strength between the discloser and the potential co-owner determine privacy concerns of the discloser?
To answer the research question we rely on the communication privacy management theory (Petronio and Altman 2002). The CPM explains how disclosure is, among others, dependent on privacy concerns, which in turn might be determined by the tie strength between the discloser and the potential co-owner (Metzger 2007; Stanton and Stam 2002; Xu et al. 2011). A qualitative study has been conducted, drawing on the CPM and the theory of strength of ties (Granovetter 1973). The results give first evidence that there is indeed an increase of disclosers’ privacy concerns depending on the tie strength between the potential co-owner and the discloser. In particular, our research shows that weak ties increase privacy concerns whereas strong and absent ties do only increase privacy concerns in certain situations.

The results have implications for the privacy research area by giving first evidence that the tie strength between the discloser and the potential co-owner is important in determining privacy concerns and therefore privacy in its whole. The remainder of the rest of the article is as follows: in section two a theoretical background is provided, followed by section three which presents the methodology. Section four presents the results followed by section five in which the results are about to be discussed.

Related Research on Privacy Concerns

In this section, a short overview on privacy concerns by previous literature is provided. Privacy in the context of information systems (IS) is usually defined as the extent of control an individual has over her personal information (Bélanger and Crossler 2011). Over the last decades privacy concerns have then emerged as the construct which has mainly been used as a proxy to understand privacy (Dinev et al. 2012; Xu et al. 2011) which is why we will also concentrate on privacy concerns.

Having a deeper look at privacy concerns, it is revealed that the construct can be separated into general privacy concerns (e.g. Malhotra et al. 2004) and situational privacy concerns (e.g. Li 2011). General privacy concerns refer to the general level of worry of an individual about the threat to her privacy (Son and Kim 2008). Situational privacy concerns in turn refer to the privacy concerns of an individual in a given situation, for example when disclosing information to a particular website (Li 2011). As situational privacy concerns often overrule general privacy concerns (Xu et al. 2011) we define privacy concerns as situational privacy concerns of an individual in a given situation. It therefore relates to the level of worry of an individual about a threat to her privacy in a particular situation.

The construct of privacy concerns is usually evaluated as being an antecedent of several other constructs (Dincelli and Goel 2017; Kehr et al. 2015; Knijnenburg and Kobsa 2013; Lankton and Tripp 2013). But privacy concerns being the dependent variable and thusly asking for the antecedents of privacy concerns is still under-researched (Smith et al. 2011). However, doing so would help in better understanding how privacy concerns as a proxy of privacy, are formed. Hence, the focus of this study is to research on antecedents of privacy concerns. In particular, previous research states that privacy concerns might also be dependent on the tie strength between the discloser and the potential co-owner (Xu et al. 2011). We therefore have a more detailed look at the potential co-owner by considering the CPM and strength of ties in the following section.

Theoretical development

In the following subsections, we provide information on the CPM and the theory of strength of ties. We also provide information in how far strength of ties is related to privacy concerns.

Communication Privacy Management Theory

The CPM is a theory used to describe how and why individuals disclose or conceal information (Petronio and Altman 2002). It has been used in different privacy studies (e.g. Chen et al. 2009; Posey and Ellis 2007) to also explain privacy concerns of individuals (Metzger 2007; Xu et al. 2011).

In particular, the CPM describes that individuals are first in control of their information and have then certain rules to determine if they will disclose their information to other individuals or not. The individual who is disclosing information is called the discloser whereas other individuals are called potential co-owners. If the discloser will disclose the information to a potential co-owner is based on certain rules.
Among others, rules are also based on privacy concerns which mainly determine if the discloser will disclose information to a potential co-owner or not (Smith et al. 2011).

How privacy concerns and therefore also rules are developed depends among others on the context of the disclosure (Petronio and Altman 2002). The context directly relates to specific situations or domains the discloser is in. Thereby, the context “depends in part upon the status of the relationship between the sender and the audience” (Stanton and Stam 2002 p. 155). In this study, it is investigated in how far this relationship between the sender (discloser) and the audience (potential co-owner) is a determinant of the privacy concerns of the discloser whereas relationship is expressed by tie strength (see Figure 1). To investigate tie strength one can use the theory of strength of weak ties (Granovetter 1973).

![Figure 1](image_url)

**Figure 1** Strength of tie as a possible determinant of privacy concerns (Petronio and Altman 2002; Stanton and Stam 2002)

**The Theory of Strength of Weak Ties**

Ties represent relationships between two individuals i.e. in our case between the discloser and the potential co-owner. They can be distinguished into strong, weak and absent ties (Granovetter 1973). The strength of a tie is dependent on the amount of time both individuals spend with each other, the emotional intensity, the intimacy and the reciprocal services (Granovetter 1973). In our study, we therefore define strong ties as individuals where all four attributes are strongly developed, e.g. very good friends or close family members (Koroleva and Štimac 2012). Weak ties are all individuals where at least one of the four properties of strength of ties (Granovetter 1973) apply. For example, individuals who know each other on a limited basis such as classmates or acquaintances (Koroleva and Štimac 2012). But also individuals who do not know each other but who are in physical distance, e.g. an individual who is shoulder surfing, will be treated as a weak tie because there is some level of intimacy and spending time together. Absent ties are those ties where there is no direct relationship between the two partners, e.g. between an agent of an intelligence agency and a “normal” individual because usually both do not spend any time together, there is no emotional intensity, no intimacy and no reciprocal service. Table 1 summarizes our definitions of strength of ties alongside with examples.

<table>
<thead>
<tr>
<th>Strength of tie</th>
<th>Definition</th>
<th>Example</th>
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<tbody>
<tr>
<td>Strong tie</td>
<td>All four attributes of strength of ties are developed in depth.</td>
<td>Very good friends or close family members</td>
</tr>
<tr>
<td>Weak tie</td>
<td>At least one of the attributes of strength of ties are developed.</td>
<td>Acquaintances or someone in physical distance</td>
</tr>
<tr>
<td>Absent tie</td>
<td>No attribute of strength of ties is developed.</td>
<td>Analyst at an organization or agent at governmental agency</td>
</tr>
</tbody>
</table>

**Table 1** Definitions and examples for strength of ties (Granovetter 1973; Koroleva and Štimac 2012)

Refining Figure 1 we can now ask in how far strong, weak and absent ties determine privacy concerns of the discloser (see Figure 2). The methodology therefore is presented in the following section.
Methodology

The goal of this research study is to find out in how far disclosers’ privacy concerns are determined by the tie strength with the potential co-owner. To answer the research question, we conduct an exploratory, positivist methodology by primarily relying on the CPM and the theory of strength of weak ties and by using interviews as a qualitative method. The reasons for choosing a qualitative method is that such a method is especially appropriate in situations where only little knowledge exists to then gain knowledge of the issue (Hofmann 2016; Recker 2013). Interviews were chosen because they are especially appropriate when researching on stakeholders who are directly involved in a situation (Forte et al. 2009; Sarker et al. 2013). As we have interviewed individuals about their privacy concerns, they are directly involved in the situation and therefore interviews are an appropriate tool. The interviews were taken in April through May 2016. They lasted about 20 minutes and were recorded.

Acquisition of the Participants

Participants were acquired by setting up an advertising banner in our university. Here we asked individuals if they want to take part in an interview to better understand privacy-related behavior. Eleven individuals got in touch with us who were then selected as interview-partners. Since the advertising was done in an academic context, most of the participants also have an academic background, however, some of them are also non-academic. Interviewees were 30.4 years old on average. To conduct the interviews we relied on two techniques which are described in the following (Flanagan 1954; Hughes 1998).

Critical Incident and Vignette-Based Techniques

In our interviews we relied on the one hand on the critical incident technique (CIT, Flanagan 1954). As we want to find out in how far disclosers’ privacy concerns are subject to change depending on the tie strength with the potential co-owner we asked individuals about their personal experiences in different situations depending on the tie strength with the potential co-owner. This was done by using the CIT, which is especially appropriate when asking individuals about experiences in a particular setting. For example, we asked individuals about their privacy concerns in the decision process of disclosing information on a particular website or when sitting on a train where another individual might be reading along.

However, not all individuals have made experiences with different types of tie strengths with potential co-owners. We therefore used the vignette-based technique on the other hand. Vignettes are basically stories about a certain situation on which respondents can answer how they would feel or react in such a situation (Hughes 1998). We then told individuals a short story about a fictional situation and asked them about their privacy concerns in such a situation. For example, we asked individuals about their privacy concerns if they were sitting on a train, using their smartphone and then realize that someone sitting next to them might be reading along.
Based on both techniques it was possible to investigate the disclosers' privacy concerns depending on the strength of tie with the potential co-owner. For the conduction of the interviews we used a semi-structured interview guideline.

**Semi-Structured Interview Guideline**

In our interviews, we used a semi-structured interview guideline to on the one hand always ask the same topics with every interviewee but on the other hand to also stay flexible, depending on the answers. The interview guideline was created by an academic researcher and was revised in association with a second academic researcher.

We started the interview with some small talk (Walsham 2006) and an introduction on the topic of privacy, to also make sure that everyone has the same understanding of privacy. We then went on by investigating in how far individuals have made experiences with privacy-related topics and in how far they had increased privacy concerns depending on the tie strength with a potential co-owner. Thereby, we tried to differentiate the co-owners based on the strength of ties as depicted in the theoretical background (Granovetter 1973). In particular, we asked the individuals about their privacy concerns in situations where a strong tie, a weak tie or an absent tie was becoming a potential co-owner by using the CIT. If needed, we also used the technique of vignettes, to bring the individual in a certain situation. We thereby did not use the word strong, weak or absent tie but rather relied on examples as indicated in Table 1. The answers were then coded.

**Coding of the Interviews**

Interviews have been recorded and subsequently transcribed by the usage of Microsoft Word and VLC Player. The evaluation was conducted using MAXQDA 11.

The evaluation was done by keeping with the guidelines of Corbin and Strauss (2008). We thusly started with open-coding to receive a general idea of the content of the interviews. With this step, we broadly identified differences in the privacy concerns of individuals. In this step, we did not rely on existing theory, yet, but were open and came up with our own categories. We thereby identified different levels of privacy concerns of individuals, reflecting their attitude and feelings about their level of worry that their privacy might be threatened. For example, individuals said they felt uncomfortable in relation to their privacy when they were about to disclose information to a particular potential co-owner. Others said it would disturb them in their privacy. Such expressions were coded as increased privacy concerns. We also broadly identified potential co-owners of information. For example, good friends, family members, acquaintances or also strangers sitting next to one on the train. However, in this step we did not rely on the definition of Granovetter (1973), yet.

In a second step, we conducted axial coding which is about relating concepts and categories with each other. This was done by relating the identified statements of privacy concerns with the identified statements relating to potential co-owners. We thereby relied on existing theory of the strength of weak ties (Granovetter 1973) in relation with Table 1, previous research on privacy concerns (Smith et al. 2011) as well as the CPM (Petronio and Altman 2002) to identify relationships between privacy concerns and strong, weak and absent ties. With this step, we identified in how far strong, weak or absent ties determine the level of privacy concerns of the participants.

In a third step, selective coding was conducted. With this step, we investigated in how far strength of ties is considered as the core concept of this research (Granovetter 1973). We did this by also investigating in how far additional determinants (Ackerman et al. 1999; Mothersbaugh et al. 2011) besides strength of ties have been mentioned, to find out in how far these concepts might overrule the strength of ties as determinants of privacy concerns. An example of the final coding is given in Table 2 in the appendix.

Coding was conducted by one researcher who has some fair knowledge on the concept of privacy. Afterwards, the interviews were also coded again by another researcher who is more knowledgeable in the field of privacy. The coding results were compared and when inconsistencies came up both researchers discussed these inconsistencies until both agreed how to code the interviews. Throughout the coding process both researchers also agreed that after some time, replies became homogenous. Hence, the
necessity of further interviews can be denied (Guest et al. 2006). After having coded the interviews, the results are to be presented.

Results

In this section the results of the interviews are depicted. They are differentiated based on the strength of ties, i.e. categorized by strong, weak and absent ties.

The goal of our research study is to find out in how far privacy concerns of individuals are determined by the strength of tie. Through open and axial coding we identified in how far this is true. Through the selective coding process we also confirmed that strength of tie is the core factor determining privacy concerns. However, two other concepts came up which also influence privacy concerns of individuals: information sensitivity and a categorization into different privacy groups. Both are integrated in the following subsections.

Strong ties

As depicted in Table 1, strong ties refer to individuals where all four attributes of tie strength are developed in depth, for example very good friends or close family members. Four interview-partners said that if there is a potential co-owner who is strongly tied up with them, they had increased privacy concerns. For example, one participant said “hmm, I would be worried about my privacy even if it is about very familiar persons”.

In addition, three of these four individuals said that it depends on the sensitivity of information if a strongly tied potential co-owner causes privacy concerns. Information sensitivity refers to possible negative outcomes when the privacy in relation to the information is diminished (Bansal et al. 2010; Mothersbaugh et al. 2011). The higher the information sensitivity the higher the potential negative outcomes. For example, one participant said “it would disturb me in cases where information about other friends is released”. This information is considered sensitive because it would cause negative outcomes if the information was released. In addition, another interview-partner said “I would be concerned if individuals I’m strongly related with, see that I do not know how to correctly spell the word ‘apple’”. Hence, not knowing how to correctly spell simple words such as ‘apple’ is seen as a sensitive information. Both statements indicate that sensitive information leads to increased privacy concerns when it comes to strong ties.

The results therefore indicate that a strong tie between the discloser and the potential co-owner raises privacy concerns of the discloser, but mainly only in cases of sensitive information. We therefore propose:

P1: A strong tie between the discloser and the potential co-owner leads to increased privacy concerns but mainly only when it is about sensitive information.

Weak ties

As depicted in Table 1, weak ties refer to individuals such as acquaintances, neighbors but also to someone who is just sitting next to an individual on a train. Ten interview-partners told us that if a weak tie is a potential co-owner then their privacy concerns are increased. For example, one participant said “well, I would be very concerned if my neighbors knew what I’m doing on the Internet”. Another participant stated that “I’m very concerned if someone sitting next to me in the restaurant is reading my information”. For weak ties, no constraints were given so we propose:

P2: A weak tie between the discloser and the potential co-owner leads to increased privacy concerns of the discloser.

Absent ties

As depicted in Table 1, absent ties are those ties where there is no relationship between the individual disclosing information and the potential co-owner. Examples refer to governmental agencies or organizations such as Google or Facebook. Four of the interview-partners told us that their privacy concerns are increased when an absent tie is a potential co-owner. For example, one participant said “I
accept that data is read along by governmental agencies, still, I do not like it”. Another participant said “well, I think this [mass surveillance] is going a way too far. I’m generally anxious about mass surveillance practices”.

However, these and other statements indicate that these individuals can be put in the category of privacy fundamentalists. Former research has shown that individuals can be separated into groups, depending on their consideration of privacy (Ackerman et al. 1999; Jensen et al. 2005). Individuals can thereby mainly be segmented into privacy fundamentalists, who consider privacy as a fundamental right, no matter who is the potential co-owner. For example, one individual said “everyone should have a right to privacy which must not be harmed”. Three of the four individuals, who state that absent ties increase privacy concerns, state the same for strong and weak ties. This indicates a confirmation that these individuals belong to the group of privacy fundamentalists. We therefore propose the following:

**P3:** An absent tie between the discloser and the potential co-owner leads to increased privacy concerns but mainly only when the discloser is a privacy fundamentalist.

**Summary**

A summary of the results is given in Figure 3. Weak ties are the main determinant of privacy concerns. Strong ties mainly only have an influence when it comes to sensitive information, and absent ties mainly only have an influence when the individual belongs to the group of privacy fundamentalists. These results have implications in terms of better being able to explain privacy concerns. A detailed discussion is given below.

**Figure 3 Privacy concerns depending on the level of tie strength, privacy group and information sensitivity; Number on the arrows represents number of interview-partners**

**Discussion**

The motivation of this paper lies in the fact that privacy concerns are an important construct in privacy-related research and even sometimes serve as a proxy of privacy (Dinev et al. 2012). However, how privacy concerns are shaped has often been neglected (Smith et al. 2011). Previous research has thereby indicated that the tie strength between the discloser and the potential co-owner might influence privacy concerns (Stanton and Stam 2002; Xu et al. 2011). We therefore deployed the research question, which is about in how far privacy concerns of individuals are determined by the strength of tie between the discloser and the potential co-owner. The results indicate that weak ties mainly determine privacy concerns, whereas strong and absent ties mainly only determine privacy concerns under certain circumstances. This has implications for theory in the following ways:

**Contributing to the communication privacy management theory:** According to the CPM (Petronio and Altman 2002) individuals create rules and based on these rules disclose or conceal information to other potential co-owners of information. The formation of the rules depends among others on the context the discloser is in, whereas the context includes the relationship between the discloser and the potential co-owner (Stanton and Stam 2002). In our research study we took a deeper look at that context by expressing the relationship with tie strength (Granovetter 1973) as it was indicated by previous research (Stanton and Stam 2002; Xu et al. 2011). In particular, we show that disclosers take
into account the tie strength between them and the potential co-owner, which lead to different privacy concerns. Therefore, we extend the CPM by providing details on the context the discloser is in and in how far different contexts lead to different privacy concerns. These privacy concerns in turn usually mainly influence the decision to disclose information or to conceal them (Smith et al. 2011). Therefore, they should mainly influence the rule formation of individuals (Petronio and Altman 2002). This confirms but also extends previous research which states that privacy concerns is dependent on the audience (Stanton and Stam 2002) or an external agent (Xu et al. 2011). Scholars, using the CPM can rely on our results and integrate tie strength between the discloser and the potential co-owner when researching on if a discloser will disclose or conceal information.

Extending general research on privacy concerns with strength of ties: We also call for the integration of strength of ties between the discloser and the potential co-owner when doing general research on privacy concerns (Dinev et al. 2012). Thus, this relationship should be seen as an additional antecedent of privacy concerns. We therefore extend previous research (Smith et al. 2011), by including strength of tie as an additional antecedent of privacy concerns. We also contribute by extending previous research about situational privacy concerns (Kehr et al. 2013; Li et al. 2011; Wilson and Valacich 2012) which should include tie strength between the discloser and the potential co-owner as a possible situation.

In particular, we show that weak ties are the main driver of privacy concerns. Hence, studies taking place where weak ties are present, e.g. on social networking sites such as Facebook (Meo et al. 2014), should pay special attention to the strength of tie between the discloser and the potential co-owner (Krasnova et al. 2009; Wilson et al. 2014). In addition, strong ties seem to influence privacy concerns mainly under the case when information sensitivity is high (Mothersbaugh et al. 2011). This has implications for research which has found out that privacy concerns are increased when it comes to members of a peer group (Chen et al. 2009). We extend that research by showing that indeed, privacy concerns are increased with members of a peer group, i.e. strong ties, but mainly only in situations where it is about sensitive information. Finally, the results indicate that absent ties mainly only seem to cause privacy concerns, when it comes to privacy fundamentalists (Ackerman et al. 1999; Jensen et al. 2005). We therefore also ask scholars, who are doing research on privacy concerns in the context of absent ties, such as mass surveillance (Penney 2016), to also include questions about the general privacy attitude of individuals. Based on that general categorization, individuals might have a default view on privacy which might determine their subsequent privacy concerns and might also overrule the tie strength with the potential co-owner. In the coming section, limitations of the study and a guideline for future research are provided.

Limitations, Future Research and Conclusion

One limitation of this study is the relatively small number of interview-partners. However, previous research has shown that there is no minimum number of interview-partners one should definitely have (Sarker et al. 2013). Also, throughout the coding process, we agreed on that replies became homogenous, hence, the conduction of further interviews can be denied (Guest et al. 2006). We therefore do not think that this limitation mainly impairs the results. Still, by providing propositions, we only give first prove on the influence of strength of ties on privacy concerns. A quantitative study might be conducted to gain results that are more rigorous. A second limitation refers to the subjectivity when conducting qualitative research. We tried to forestall this limitation by having two researchers coding the interviews. Therefore, this limitation influences the results – if at most – only at a minimum.

Future research can build on these results and research on in how far tie strength between the discloser and the potential co-owner might be more fine-granular than proposed by the theory of strength of weak ties (Granovetter 1973). Furthermore, we only asked how privacy concerns are formed based on tie strength. We did not ask for, why privacy concerns are formed this way. Future research can build on our research to answer that question. In addition, in how far information sensitivity still plays a role with strong ties when it comes to privacy fundamentalists could be a further research avenue.

References


Appendix

<table>
<thead>
<tr>
<th>Statement</th>
<th>Coding strength of ties</th>
<th>Coding privacy concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Hmm, I would be worried about my privacy even if it is about very familiar persons.&quot;</td>
<td>Strong ties (very familiar persons)</td>
<td>Increased privacy concerns (worried)</td>
</tr>
<tr>
<td>&quot;I would be concerned if individuals I'm strongly related with see that I do not know how to correctly spell the word 'apple'&quot;</td>
<td>Strong ties (strongly related individuals)</td>
<td>Increased privacy concerns (concerned) in combination with information sensitivity (word apple)</td>
</tr>
<tr>
<td>&quot;Well, I would be very concerned if my neighbors knew what I'm doing on the Internet&quot;</td>
<td>Weak ties (neighbors)</td>
<td>Increased privacy concerns (concerned)</td>
</tr>
<tr>
<td>&quot;I'm generally anxious about mass surveillance practices&quot;</td>
<td>Absent ties (mass surveillance)</td>
<td>Increased privacy concerns (anxious)</td>
</tr>
<tr>
<td>&quot;Yes, this [mass surveillance] disturbs me. Everyone should have a right to privacy which must not be harmed&quot;</td>
<td>Absent ties (mass surveillance)</td>
<td>Increased privacy concerns (disturbed) in combination with privacy fundamentalist (right to privacy)</td>
</tr>
</tbody>
</table>

Table 2 Coding example