

PSYCHOLOGY OF OWNERSHIP AND ASSET DEFENSE: WHY PEOPLE VALUE THEIR PERSONAL INFORMATION BEYOND PRIVACY

Completed Research Paper

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Abstract

Analysts, investors and entrepreneurs have for long recognized the value of comprehensive user profiles. While there is a market for trading such personal information among companies, the users, who are actually the providers of such information, are not asked to the negotiations table. To date, there is little information on how users value their personal information. In an online survey-based experiment 1059 Facebook users revealed how much they would be willing to pay for keeping their personal information. Our study reveals that as soon as people learn that some third party is interested in their personal information (asset consciousness prime), the value their information to a much higher degree than without this prime and start to defend their asset. Furthermore, we found that people develop a psychology of ownership towards their personal information. In fact, this construct is a significant contributor to information valuation, much higher than privacy concerns.

Keywords: Information valuation, psychology of ownership, privacy, Facebook, empirical research

Introduction

“Personal data is the new oil of the Internet and the new currency of the digital world.” With these words Meglena Kuneva, Europe’s Consumer Commissioner, expressed an economic reality that is increasingly manifest on a global scale: Personal Information (PI) is emerging as a new asset class (World Economic Forum 2011). Every day, users send about 47 billion (non-spam) e-mails, submit 95 million tweets on Twitter and share 30 billion pieces of content on Facebook (World Economic Forum 2011). All of this user-created information does not go unused by companies: companies collect and use the information for profit. A company like Google can build up a stock market valuation of 160 billion USD (Finanzen.net 2012), mainly by using their users’ information to personalize advertisements. Data aggregation companies such as Rapleaf, Acurint, Choicepoint, Merlin and many others provide detailed access to all kinds of household information in exchange for monetary rewards. Based on Facebook’s listing on the stock exchange, each Facebook profile was theoretically valued at around 90-120 USD.

While data markets flourish, users provide their PI abundantly and typically for free. People generously supply ZIP codes, purchase details, social security numbers, and more. Scholars even argue that people deliberately ‘over-disclose’, apparently without much thought about the potential monetary value or benefits of their digital traces (Preibusch et al. 2012). When asked how much they would pay to save their entire Facebook profile from deletion, 48% of 1045 Facebook users recently said that they would not pay a cent; the median value was between 0 and 2 EUR for saving the entire profile, including *all* personal data, friends, photos, communications, and so on (Bauer et al. 2012). So do people not value their PI? Why do people share so abundantly and seem to not value their PI, but then voice serious privacy concerns? On a global scale, 88% of people worry about who has access to their data, 86% state that they recently became more security conscious about their data, 83% are concerned when they hear that their data may be stored overseas, and 80% think that governments regulate the market and impose high penalties on companies that do not use data responsibly (Fujitsu 2010).

This article aims to shed light on people’s valuation of their PI.

To date, insights into the valuation of PI have been collected in a research stream called ‘behavioral economics of privacy’. Here, scholars have focused on *privacy* behavior within the wide realm of daily communication, and they have assumed that people should consciously weigh the privacy costs of their disclosures against the benefits of such disclosures. We, however, postulate that the economics of personal information is distinct from the economics of privacy because the value that people attribute to their PI may be driven by more than just privacy considerations. In other words, while the economics of privacy seems more related to the kind of information that people want to keep secret, the economics of personal information relates to *all* information that people share. In this context, we question whether privacy is the main factor that determines the value that people attach to their data. And we ask about the role of other factors, such as knowledge about personal data markets or the degree of self-identification with one’s PI.

Behavioral economists have shown that people value their PI particularly when the information is related to sensitive issues such as sex or crime (Grossklags and Acquisti 2007; John et al. 2011). Economists have also shown that information valuation is typically context related. For example, Huberman et al. (2005) demonstrate that the relative desirability of a trait impacts the price demanded to reveal private information. Others have shown that the framing of questions or simple privacy primes can significantly alter people’s willingness to share PI (Acquisti et al. 2011; John et al. 2011). When behavioral economists have studied privacy, they have been most interested in confirming mechanisms of bounded rationality that privacy decisions may be subject to, particularly at the moment of revelation. In our study, we depart from this approach. By using *real* Facebook profiles as objects of analysis, we present one of the first studies on the valuation of common user information that has already been revealed. Therefore, we look into the post hoc value of PI of the kind traded in personal data markets. And in doing so, we do not investigate decision making pitfalls in revelation situations, but manipulate diverse factors that can drive peoples’ post hoc perception of how valuable their PI is.

For this purpose, we analyzed 1059 Facebook users’ willingness to pay (WTP) to save their entire Facebook information from deletion (in line with Bauer et al. (2012)) *or* from being sold. Our analysis was

based on a scenario in which users were asked to imagine that they logged into Facebook one day and encountered a message from Facebook CEO Mark Zuckerberg. The message informed the users that Zuckerberg was closing down the service and deleting or selling all information on the platform. To save and keep their PI, including all friends, posts, pictures, wall posts, and so on, the users needed to make Zuckerberg an offer for it. So we asked participants of the study the maximum that they would be willing to pay for it.

We find that, besides privacy concerns, several factors influence PI valuation. In particular, we prove that people develop what we call a “psychology of ownership” (PoO) for their Facebook information, and we show that this ownership perception is the most important driver of PI valuation over and above information sensitivity. Furthermore, we observe that “asset consciousness” plays a role for people’s valuation of their PI. Asset consciousness is a person’s awareness of owning something valuable for which there is a market; in our case, asset consciousness involved being aware of owning a Facebook profile that is desired by a data marketer.

The article is structured as follows: The next section hypothesizes about the importance of privacy attitudes, psychology of ownership and asset consciousness for the valuation of PI. The subsequent section describes an experimentally varied questionnaire study, followed by a section for the results and discussion. Core results are summarized again in the conclusion.

The Drivers of Personal Information Valuation: Asset Consciousness, Psychology of Ownership and Privacy?

At the core of our research is the question of whether and how people value their PI. Recent studies have shown that people are willing to pay a service fee for more privacy controls in online services (Hann et al. 2007; Krasnova et al. 2009b). People are also more likely to buy from websites with a salient privacy policy and pay a premium for products offered in a trustworthy context (Jentzsch et al. 2012; Tsai et al. 2007). All of these studies confirm people’s willingness to offer monetary rewards for good privacy practices at the organizational level. Indirectly, these studies suggest that people must value their PI to some extent; otherwise, it would be irrational to pay to protect it.

Some scholars also investigate the value of PI directly and at the individual level. Huberman et al. (2005), for example, experimentally determined the minimum price that people would expect to be paid for disclosing their weight or age information. They found that people whose age or weight was less socially desirable would demand a higher price for that information. Grossklags and Acquisti (2007) observed that the willingness to pay to protect individual pieces of information is higher when a person perceives the respective type of PI to be more intimate (i.e. information on sex partners). Still others tried to formalize the perceived cost of revelation per data point (Annacker et al. 2001). The focus of these studies underlines scholars’ focus on the privacy value. They are interested in the sensitivity of information in different contexts and the question of how monetary expectations reflect this sensitivity. In general, these studies seem to confirm that people who are more sensitive to privacy put a higher value on their PI. Transferring this line of thinking to the Facebook context, we expect that people who are more concerned about the privacy of their Facebook information should put a higher value on their Facebook information.

H1: People with higher privacy concerns value their Facebook profile information more than people with lower levels of privacy concern.

Although we acknowledge the importance of the privacy focus present in most previous studies investigating PI, we want to slightly part from this traditional research emphasis. In the experimental work described hereafter, we investigate additional perceptions and behavior relevant for PI valuation beyond privacy. Grossklags and Acquisti (2007) already showed that there is a large difference between people’s willingness to pay to protect their information and their willingness to accept offers in exchange for their information. The latter situation is one in which the individual takes an active role as a seller of his or her PI and prices it according to an anticipated market. The scholars observe that, when people take the role of an active marketer, the valuation of their PI increases considerably. One explanation that the scholars offer for this observation is the ‘endowment effect’ (Thaler 1980): “People generally demand more money as compensation for giving up an object than they are willing to pay in order to obtain the same object” (van de Ven et al. 2005). In another paper, Acquisti et al. (2009) find that people who are endowed with PI are less likely to give up their privacy for a particular amount than if they had to pay that

same amount to protect it (Acquisti et al. 2009).

Because scholars find proof of an endowment effect, and in spite of the virtual and inalienable nature of PI, people may see privacy as a kind of asset they own or, in other words, as their ‘property’. Even though legal scholars have long discussed the idea of “privacy as property” (Schwartz 2004), no experimental research exists on property perceptions of PI. In psychology and marketing, perceptions of property or possession have been investigated, mostly for tangible goods (Pierce et al. 2003). Psychology of ownership has been identified as a core construct for reflecting people’s possessive feelings. Psychology of ownership answers the question “What do I feel is mine?”, and its conceptual core is a sense of possession (Wilpert 1991) towards a particular target. In his political philosophy, Locke (1690) argued that we own our labor and ourselves, and therefore, we are likely to feel that we own all that we create, shape, or produce. Against this background and taking into account the considerable investment of time, effort and personal creativity that people invest in their Facebook profiles, we argue that regular users of the platform will probably develop feelings of ownership for their PI on the platform.

Presuming that people build up a psychology of ownership for their Facebook information, we expect that people with a strong sense of ownership will put a higher value on their PI on the platform. Several arguments exist for a positive relationship between a psychology of ownership for PI and PI asset valuation. These are founded in the multidimensional nature of the PoO construct. First, PoO is constituted through a feeling of being at home with one’s possessions. Pierce et al. (2003) write: “...possessions help create ‘a place,’ symbolically captured by the concept of ‘home’. Indeed, selling one’s home is more difficult than selling somebody else’s property, as we all know. The emotion that we build up for our own dwellings drives our valuation for them. Accordingly, someone who feels more at home with his or her profile on Facebook should perceive it to be more valuable than someone who does not. Furthermore, numerous scholars have suggested that possessions also serve as a symbolic expression of the self, and that there is a close connection between possessions, self-identity, and individuality (e.g., Abelson and Prentice 1989; Dittmar 1992; Porteous 1976). People communicate their identity to others and achieve recognition and social prestige in return. “Possessions can act as signs of the self and role models for its continued cultivation“ (Rochberg-Halton 1984, p. 339 cited in Pierce et al. 2003). Extending this notion, people may value themselves and reflect some of this identity in their Facebook profile. If they do, we believe that it is reasonable to argue that people who value themselves more and invest more of their identity in their profile will attach greater value to their information on the platform. In fact, we showed in an earlier study (Bauer et al. 2012) that people who use Facebook as a means to keep a diary of their lives are willing to pay more to prevent profile deletion. Summing up, PoO is composed of several value-sensitive constructs (time investment, home feelings and identity construction). We therefore hypothesize:

H2: People with a higher degree of psychology of ownership perception value their Facebook profile information more than people with lower levels of this ownership perception.

Finally, we believe that being aware that there is a market for PI will influence people’s valuation of their PI. We define a new construct, which we term ‘asset consciousness’. Asset consciousness is a person’s awareness of owning something valuable; people gain this awareness when they learn that there is a market for the object or interest from another party. A good way to describe asset consciousness is to think of young children at play. Often, one can often observe strong reactions – “MY car”, “ME!” – when a child picks up another child’s toy (Isaacs 1933; Levine 1983). The point here is that a party A learns about another party’s (B) interest in something A possesses. As an immediate reaction to that knowledge, A’s perception of the value of his or her possession is increased and some kind of ‘asset defense effect’ sets in. We conjecture that such mechanisms could also be at work with adults and their PI valuation once they learn about personal data markets.

Today, people’s knowledge about PI markets is still limited. “Consumer ignorance leads to a data market in which one set of parties does not even know that negotiation is taking place.” (Schwartz 2004, p. 2078). For instance, only 7% of Britons read online terms and conditions before signing up for products and services (Smithers 2011). What would happen if people learned that others are making money from their PI? An experiment conducted by Cvrcek, Vashek et al. (2006) on location data showed that, when study participants learn that their PI will be used not only for academic but also for commercial purposes, 25-57% of participants increased the amount of money that they wanted to receive for study participation. The desire to participate in the commercial exploitation of one’s PI assets may be due to fairness

perceptions. But it may also simply be due to asset consciousness. If such a mechanism was at work, today's PI data markets could expect people who find out that money is being made from their PI to want to participate in the data markets. We therefore hypothesize:

H3: People with asset consciousness for their personal information value the information more than people without such consciousness.

Methodology

In cooperation with a major Austrian newspaper, we conducted a questionnaire-based online experiment. People could win an iPod Shuffle for their participation. In the first part of the questionnaire, we measured people's WTP for their Facebook profile information by using the contingent valuation method (CVM) (Pearce et al. 2006). CVM is a survey-based, economic method for the valuation of non-market resources and assets that do not have a market price (yet). In the second part, we asked participants an extensive battery of questions primarily aimed at explaining their stated levels of WTP. In addition, we asked two direct questions to complement our insight into people's information valuation: (1) perceived PI value and (2) sense of loss over PI deletion. Perceived PI value was measured on a 9-point scale (1 = do not agree at all, 9 = fully agree) and was based on the following statement: "I consider my Facebook information as valuable". Sense of loss over PI deletion was also measured on a 9-point scale and was based on the following statement: "If Facebook deleted my information, I would not perceive a loss."

For measuring the WTP, we confronted study participants with a scenario in which they were threatened with the loss of all of the information in their Facebook profile, which included their posts, others' posts, photos, links, friends, personal messages, and so on. We asked the participants the maximum that they would be willing to pay to save their information. We ensured that every participant had the same understanding that losing one's Facebook information would mean losing 'everything' on the platform.

The experimental setup included four different scenario conditions, one of which was presented at random to a participant (between subject-design): All participants were told to imagine that one day, they log in to Facebook and cannot reach their information. Instead, a message from Facebook CEO Mark Zuckerberg appears, saying that he is tired of the business and therefore intends to shut down the platform. Table 1 (in the next section) summarizes the following four conditions:

In condition 1, Zuckerberg wants to delete all of the data on Facebook. The only way to keep Zuckerberg from deleting the information is to offer him money. Participants were then asked to enter the maximum amount in EUR that they would pay to keep their information. They were also told that the data could be easily transferred to a different social network provider and that most other users would probably decide to transfer. This additional information was provided so that participants had stable assumptions about the transaction cost of data transfer and the continued availability of the friends in their network.

In condition 2, the information varied; participants were told that they could only download their Facebook information to their hard drive. We expected a different WTP for profile information under this second condition, because in condition 1 participants could continue using their information in a social network, while in condition 2 they could not. We thought that participants would be willing to pay a premium for service continuation, and we wanted to isolate this 'service value effect' from the pure value attributed to one's profile information.

We then added two conditions in which, again, participants were either told that they could download their information to their hard drive (condition 3) or transfer their data to another social network (condition 4). However, this time the alternative was not that Mark Zuckerberg deletes the information, but that he resells it to a *trustworthy* third party that has expressed interest in the information. Offering Mark Zuckerberg money would allow the participant to transfer or download their information and prevent the sale of his or her PI to the ostensible third party. In conditions 3 and 4, we thus created asset consciousness among the participants, as they learned that their PI would see secondary uses in a data market. As a result of asset consciousness, we expected people to offer more money in these conditions because they recognize that their PI is valuable to others. Note that we described the potential third party data recipient as trustworthy because we wanted participants' PI valuation to be driven by asset consciousness, as opposed to fear of privacy issues in the face of sudden data sales. Through the use of the

word “trustworthy”, we streamlined as much as possible all participants’ expectation of their PI being shared within a legitimized personal data market environment.

The WTP measure we employed in the study was extensively pretested (Bauer et al. 2012). In fact, in an earlier Facebook study that we conducted, we compared four different methods for measuring Facebook users’ WTP for their PI. These methods included different versions and combinations of the contingent valuation method (CVM) (cf. Ciriacy-Wantrup 1947) and the Becker, DeGroot and Marschak (BDM) procedure (Becker et al. 1964). The CVM presents a fictitious scenario and asks participants directly to state their WTP; no (additional) incentive is given to disclose the ‘real’ WTP. The BDM procedure is applied in real-world scenarios, where participants have to pay a price and receive a product or they pay nothing and receive nothing; accordingly, this procedure is incentive-compatible. We found that incentives, which are part of the incentive compatibility design in the BDM approach, bias WTP results for our purposes, as the stated WTP levels will be closely related to the selected incentives’ value (Bauer et al. 2012). Accordingly, we decided to adopt the CVM without any incentive. (The iPod Shuffle was raffled among all participants of the survey without any relation to the WTP elicitation method; therefore, the incentive did not impact the results.) Furthermore, we found that the presentation of a fictitious scenario – as suggested by the contingent valuation approach – is important for retrieving realistic results. The conditions’ stories were therefore told in a ‘Facebook atmosphere’: the survey’s background picture was a grayed-out Facebook profile and Zuckerberg’s well known profile picture brought the bad news. People’s impression that the scenario was ‘realistic’ is confirmed by the comments that they provided right after the willingness to pay question. We asked people for the reasons underlying their WTP amounts. Depending on the scenario condition, they reacted quite emotionally and argued as if the scenario had really happened.

After entering their WTP and commenting qualitatively on the reasons for the amount stated, a battery of questions was presented to the participants. One core construct that we controlled for was the influence of people’s privacy concerns. To measure these concerns, we employed the scale developed by Krasnova et al. (2009a), which specifically targets privacy concerns on social networks. This scale distinguishes between concerns relating to (1) the organization passing on PI to other parties, (2) peers abusing one’s wall or PI and (3) friends and the general public getting too much access and insight into one’s activities.

In addition, we measured people’s PoO perceptions for their Facebook data. We considered existing scales to measure psychology of ownership (PoO). However, existing scales mostly relate to employees’ PoO for organizational assets (Avey et al. 2009; Mayhew et al. 2007). Therefore, we could not directly transfer these scales to the PI asset and the Facebook context. Consequently, we had to construct a new measure for PoO. We measured PoO as a second order construct and based its latent value on what scholars consider PoO’s three core motivational dimensions (Pierce et al. 2003): feeling at home with one’s possessions, feeling efficacious through one’s possessions, and building self-identity with the help of possessions. As we have outlined in section 2, feeling at home is about people’s propensity to build up a self-identifying connection with their possessions. The second dimension of PoO is grounded in the motivation to be efficacious in relation to one’s environment. Furby (1978) postulates that the motivation for possession stems from the individual’s need for effectance, which is the ability to affect the environment, and the ability to produce desired outcomes in the environment. “Possessions”, she notes, “have an instrumental function – they make possible certain activities and pleasures. In other words, they enable one to effect desired outcomes in one’s environment” (Furby 1978). We therefore developed items that would reflect people’s conviction that they positively affect the Facebook world through their Facebook PI. Finally, numerous scholars have suggested that, in addition to serving an instrumental function (efficacy/effectance motive), possessions also serve as a symbolic expression of the self, and that there is a close connection between possessions and personal identity (e.g., Abelson and Prentice 1989; Dittmar 1992; Porteous 1976). We developed items on the basis of these dimensions of PoO and then conducted an exploratory factor analysis (unrestricted, principal components FA) to confirm the validity of our constructs and the reliability of our scales. For the constructions of the scale, we used only factor pure items and items that positively contributed to the reliability of the scale. With the help of confirmatory factor analysis we verified our measurement model (see Appendix). The measure for each construct was the mean value from the items of the appropriate scale.

Finally, the questionnaire controlled for some additional constructs that may explain the valuation of PI on Facebook. For instance, we asked people whether they have copies of their Facebook information. We

also asked them about the number of friends they have on Facebook, because we know from our previous study that this variable influences WTP (Bauer et al. 2012). We also asked for people's brand perception with the help of scales from Sichtmann (2007) and Li et al. (2008), because WTP may depend equally on who receives the money and whether one likes and trusts the recipient. We did not ask for usage depth or patterns, because we knew from our previous research that the explanatory value of different Facebook usage forms is low (Bauer et al. 2012). The questionnaire can be found in the Appendix.

Results

1059 regular facebook users completed the questionnaire. The usage of Facebook among them is high: 88.4% of our respondents log in to the platform at least once a day. Sex distribution was skewed (70% male, 30% female), which may be due to the technology affinity of the online magazine that helped to recruit participants for the study. A wide range of ages was present in the sample. The mean age was 30 (SD=10). Median salary was 1500 EUR, one forth received less than 875 EUR per month, and one forth more than 2000 EUR. The mean of 2600 EUR was thus unjustly influenced by couple of extremely high earners. Notably, 46% of the participants did not disclose their monthly income. EUR. 97.5% of our sample originates from Austria or Germany.

Before delving into our hypotheses, we investigated whether a 'service value effect' is observable between conditions 1 and 2 and between conditions 3 and 4. Surprisingly, participants did not attribute more value to their PI in the conditions where they would be able to continue using a social network service. Table 1 summarizes the results. For the two groups with no asset consciousness, the mean WTP was 13 EUR for condition 1 (transfer data to another social networking service) and 17 EUR for condition 2 (download data to hard drive). Standard Mann Whitney U – tests between the WTP amounts showed no significant differences ($p=.295$). Equally, WTP in conditions 3 and 4 did not vary significantly, even though the absolute mean values would suggest so at first sight (WTP_{cond3}=39 EUR, SD_{cond3}=97 EUR; WTP_{cond4}=74 EUR, SD_{cond4}=226 EUR; $p=.748$). Because no differences were observed in our dependent variable, we combined conditions 1 and 2 as well as 3 and 4. We based further analyses on a comparison between participants that were primed for asset consciousness and participants that were not.

Table 1. Willingness to Pay for Personal Information

	download PI – no utility premium	transfer PI – utility premium	
Facebook deletes PI - no asset consciousness prime	scenario 2 (N=280) median WTP = € 0 mean WTP = € 17 SD = € 125 % of people that paid nothing = 60 %	scenario 1 (N= 295) median WTP = € 0 mean WTP = € 13 SD = € 70 % of people that paid nothing = 64 %	scenarios 1&2 (N=575) median WTP = € 0 mean WTP = € 15 SD =€ 101 % of people that paid nothing = 62 %
Facebook sells PI - asset consciousness prime	scenario 4 (N= 243) median WTP = € 5 mean WTP = € 74 SD = € 226 % of people that paid nothing = 39 %	scenario 3 (N= 241) median WTP = € 5 mean WTP = € 39 SD = € 97 % of people that paid nothing = 40 %	scenarios 3&4 (N=484) median WTP = € 5 mean WTP = € 56 SD = € 175 % of people that paid nothing = 40 %

We compared WTP for one's Facebook information under the belief that it would otherwise be deleted (no asset consciousness prime) versus the belief that it would be sold to an interested, trustworthy third party (asset consciousness prime). What is surprising and reconfirms an earlier study we conducted (Bauer et al. 2012) is that people's valuation of their PI on Facebook is extremely low: the median EUR value stated by 575 participants who were not asset conscious is 0 EUR. 62% would not pay anything to save their PI. Participants who were aware of data markets were willing to pay only 5 EUR to save their PI and avoid

resale. These absolute figures clearly indicate that people do not value their Facebook PI much.

What is interesting is that there is a clear jump in PI valuation when people learn about data markets. On average, people are willing to pay 3.7 times more if their data is not only saved, but also protected from resale. This difference is highly significant (Standard Mann Whitney U – tests, $p=.000$). In essence, our results support hypothesis 3, which states that people who are asset conscious value their PI more than people without such consciousness.

The finding is further strengthened by a regression analysis on people's WTP, which we performed to investigate explanations for people's WTP for their PI. As the WTP variable was not normally distributed and broke the assumptions of linearity, homoscedasticity and normally distributed errors, we could not use a linear regression for analysis. Therefore, we dichotomized the WTP variable into zeros (the respondent would not pay to protect his or her Facebook PI) and ones (the respondent would pay to protect his or her Facebook PI) to perform a logistic regression. The regression was first computed on the entire sample in four steps, isolating the individual effects of our hypothesized constructs (Table 2). In addition, we controlled for gender, the number of Facebook friends, income, brand perception of the platform and existence of a personal copy of one's Facebook PI because we expected these variables to influence WTP.

However, due to the very low response rate about income and the subsequent loss of sample size (i.e. loss of power for the analysis; due to the listwise deletion of missing entries) and the nonexistent influence that both income and gender had on the dependant variable (WTP), they were excluded from further analysis. As Table 2 shows, all hypothesized constructs have a significant influence on people's willingness to pay for their PI. Nagelkerke R^2 ranges from 0.15 in step 1 to 0.26 in step 4. Hosmer and Lemeshow's Goodness of fit test is not significant. As can be expected from the analysis above, asset consciousness plays a particularly strong role in making people pay for their PI. The asset consciousness manipulation was entered as a dummy into the regression (1=asset-conscious conditions 3 & 4, 0 = non-asset-conscious conditions 1 & 2). When participants learned about a buyer for their PI, they were 2.7 times more likely to pay to keep their PI and avoid its sale.

Some may argue that our market prime (asset consciousness prime) in conditions 3 and 4 varied the level of privacy concern, which then affected participants' willingness to pay to-protect their data. We tried to minimize this potential confounder and controlled for it in our analysis by separating the influence of asset consciousness from the influence of privacy concerns (Table 2). As we mentioned above, we explicitly depicted the ostensible buyer of the data as "trustworthy" to mitigate potential privacy concerns. Second, the actual privacy concerns of our participants in our sample was below the middle of the scale across all manipulations: The average privacy concern of $M=4.75$ ($SD = 1.73$) on a scale from 1 (I do not at all agree to a privacy concern) to 9 (fully confirm privacy concerns) says that our sample, on average, thinks that there is no privacy issue around Facebook or is unsure (5 = "unsure"). Therefore, the argument (for a confounding variable) that the sample pays to *protect* itself does not make sense. Why should unconcerned people pay to protect themselves? Third, and most importantly, informing participants about the secondary data market in the asset consciousness scenario had hardly any effect on their observed privacy concerns after this prime. In contrast, the mean privacy concern in the asset-conscious group ($M=4.59$, $SD=1.70$) was even lower than in the group that was not asset conscious ($M=4.87$, $SD=1.74$) ($p=.008$). If the prime had played a role, the privacy concern would need to be higher.

That said, amongst individuals who had a priori privacy concerns on Facebook (and regardless of the manipulation), individuals who were more concerned were more willing to pay to keep and save their PI. A one point change in privacy concern (on a nine point scale) makes it 1.23 times more likely that someone is willing to pay for his or her PI ($B=.21$; $SE=.04$; $p<.001$). The increase in the model's explanatory power through privacy, expressed by Nagelkerke R^2 , is 3%. These findings support hypothesis 1: People with higher privacy concerns value their Facebook profile information more than people with lower levels of privacy concern. However, the overall influence of privacy seems to be small.

A similar effect can be observed for PoO. Psychology of ownership was measured as the mean perception of people's feelings of home with their profiles, identity construction through their profiles and perceptions of effectiveness. On average, our sample again dispersed around a little below the middle of the scale ($M = 4.40$ $SD= 1.52$ on a range from 1 to 9). However, PoO has a significant influence ($B=.31$; $S.E.=.06$; $p<.001$) on people's WPT in all four conditions that we investigated. Participants who have

greater psychology of ownership for their PI are willing to pay more to keep it, to protect it. Hypothesis 2 is therefore supported. Again, the influence on the overall model was relatively low, with an improvement of the Nagelkerke R^2 by only 3%.

The combined logistics regression analysis (Table 2) gave us a good overview of the overall effects observed in the study; furthermore, it allowed us to see the strongest unique influence of the asset consciousness prime. However, to better understand the relative importance of privacy for WTP, we conducted a separate logistics regression on the WTP decision for each group: the group that was not asset conscious (conditions 1 & 2) and the one that was (conditions 3 & 4).

As Tables 3 and 4 show, we conducted the analysis in three steps; the control variables were entered in the first step of the analysis. Both models had good fit (Hosmer and Lemeshow Goodness of Fit test was not significant), correctly predicting around 70% of the cases (non asset conscious model 72.2% and asset conscious model 67.6% of the cases). The Nagelkerke R^2 was .25 and .20, respectively.

The most important finding from this analysis supports privacy scholars' expectations: in the asset conscious case, people's privacy concerns drives PI valuation. Privacy concerns (entered as a second step in the logistic regression) raise Nagelkerke R^2 by 6%, from 11% to 17%. However, in the group that was not asset conscious, privacy influences the R^2 by just 1%, and privacy is insignificant even in the final model.

A second interesting insight gained from comparing the two separate logistic regressions is the relative importance of privacy when compared to PoO. In the group that was not asset conscious, where WTP relates only to information value, privacy loses its significance in the third step of the model ($B = 0.08$, $SE = 0.06$, $p > .05$). PoO, in contrast, is highly significant ($B = 0.36$, $SE = 0.08$, $p < 0.001$). It is the feeling that one is effective and at home with one's data and identifies with it that drives PI valuation, not privacy. When becoming asset consciousness, however, this relationship changes. Even though PoO continues to significantly influence WTP ($B = 0.26$, $SE = 0.08$, $p < 0.001$), its influence on the Nagelkerke R^2 drops from 5% in the group that is not asset conscious to 3% in the asset conscious group. At the same time, privacy gains significant predictive power in the final model of the asset consciousness group ($B = 0.29$, $SE = 0.07$, $p < 0.001$), adding 6% to Nagelkerke R^2 ; it even has a superior odds ratio ($OR = 1.34$) when compared to PoO ($OR = 1.29$); the two constructs can be compared here because they were both measured on a 9-point scale.

What these findings tell us is that privacy concerns play out only in the presence of market awareness or asset consciousness. Otherwise, privacy barely influences PI valuation. Could this explain the currently observed "privacy paradox"? Do people perhaps not know yet about personal data markets and therefore value their privacy so little that they freely disclose? For sure, our results put hypothesis 1 into perspective. It cannot be said that people with higher privacy concerns generally value their Facebook profile information more than people with lower levels of privacy concern. They only value it more for privacy reasons when they know that there are secondary parties who could obtain it.

Findings on the Relationship between Psychology of Ownership, Privacy Concerns and the Perceived Value of One's Personal Information

Regression analyses confirmed the significant influence of privacy and PoO on people's WTP for their own PI. However, the dichotomization of the WTP variable eliminated a lot of information. As the WTP measure is just one measure that can be used to understand how people value their PI, we included an item in our questionnaire that explicitly asked people whether they valued their information on Facebook: "I consider my Facebook information as valuable". Responses were measured on a 9-point Likert scale ranging from 1 strongly disagree to 9 strongly agree. The manipulations do not play a role in this analysis, because this valuation referred to the real life status quo of people's perceptions of their data.

Table 2. Results of the Logistic Regression for all Conditions

Predictor	Step 1			Step 2			Step 3			Step 4		
	B	SE	OR	B	SE	OR	B	SE	OR	B	SE	OR
Constant	-2.62	.29		-2.93	.31		-4.29	.43		-4.83	.45	
Have a copy of PI	.23	.04	1.26***	.21	.04	1.23***	.21	.04	1.23***	.22	.04	1.24***
Number of friends (up to 100)												
100 to 200 friends	.28	.19	1.32	.27	.19	1.31	.29	.19	1.33	.18	.19	1.20
200 to 350 friends	.74	.19	2.10***	.80	.19	2.22***	.77	.19	2.17***	.58	.20	1.79**
Over 350 friends	.96	.20	2.62***	.99	.20	2.69***	.98	.21	2.66***	.62	.22	1.87**
Brand liking	.26	.05	1.30***	.26	.05	1.30***	.33	.05	1.40***	.21	.06	1.24***
Asset consciousness				.86	.14	2.36***	.95	.14	2.57***	.98	.14	2.66***
Privacy concerns							.21	.04	1.23***	.18	.04	1.20***
Psychology of ownership										.31	.06	1.36***
Nagelkerke R ² (sig. of step)			.15***			.20***			.23***			.26***

Note: B=estimated coefficient; SE = standard error; OR=odds ratio; *p<.05; **p<.01, ***p<.001
 Dependant variable willingness to pay (yes/no) N=1033 (all conditions 1-4)
 Hosmer and Lemeshow Chi²= 11.93, p=.154

Table 3. Results of the Stepwise Logistic Regression for Non-Asset-Conscious Participants

Predictor	Step 1			Step 2			Step 3		
	B	SE	OR	B	SE	OR	B	SE	OR
Constant	-3.49	.43		-4.27	.58		-4.91	.62	
Have a copy of PI	.30	.05	1.35***	.29	.05	1.34***	.31	.05	1.36***
Number of friends (up to 100)									
100 to 200 friends	.13	.27	1.14	.13	.27	1.14	-.01	.28	.99
200 to 350 friends	.71	.26	2.03**	.69	.27	2.00**	.46	.28	1.59
Over 350 friends	.99	.28	2.69***	.97	.28	2.64**	.57	.30	1.77*
Brand liking	.33	.07	1.39***	.37	.07	1.44***	.24	.08	1.27**
Privacy concerns				.12	.06	1.13*	.08	.06	1.08
Psychology of ownership							.36	.08	1.44***
Nagelkerke R ² (sig of step)			.19***			.20*			.25***

Note: B=estimated coefficient; SE = standard error; OR=odds ratio; *p<.05; **p<.01, ***p<.001
 Dependant variable willingness to pay (yes/no) N=565; Hosmer and Lemeshow Chi²= 10.79 p=.214

Table 4. Results of the Stepwise Logistic Regression for Asset-Conscious Participants

Predictor	Step 1			Step 2			Step 3		
	B	SE	OR	B	SE	OR	B	SE	OR
Constant	-1.41	.42		-3.32	.60		-3.74	.63	
Have a copy of PI	.10	.05	1.11	.10	.06	1.11	.11	.06	1.12*
Number of friends (up to 100)									
100 to 200 friends	.43	.26	1.54	.47	.27	1.60	.40	.27	1.49
200 to 350 friends	1.00	.29	2.73***	.98	.30	2.67**	.82	.30	2.28**
Over 350 friends	1.05	.30	2.85***	1.06	.31	2.88**	.75	.32	2.13*
Brand liking	.18	.07	1.19*	.29	.08	1.33***	.18	.09	1.19*
Privacy concerns				.31	.06	1.36***	.29	.07	1.34***
Psychology of ownership							.26	.08	1.29**
Nagelkerke R ² (sig. of step)			.11***			.17**			.20**

Note: B=estimated coefficient; SE = standard error; OR=odds ratio; *p<.05; **p<.01, ***p<.001
 Dependant variable willingness to pay (yes/no) N=468; Hosmer and Lemeshow Chi²= 5.13, p=.744

Generally, the mean valuation of one's PI was a little below the middle of the scale (on average undecided or somewhat did not agree with the statement), mirroring our findings on WTP ($M = 4.57$, $SD = 2.45$). The perceived value of one's information is significantly correlated with the stated WTP (Spearman's $Rho = .28$, $p = .000$). The assertion of the assumptions for linearity, homoscedasticity, normally distributed errors and multicollinearity allowed for linear regression analysis. We conducted a hierarchical regression on all four groups. We isolated the unique influence of privacy and PoO on perceived PI value. As with the logistic regression, we conducted the analysis in three steps, entering the control variables in the first step, the privacy concerns in the second step and the PoO in the last step of the analysis. Every step showed a significant improvement over the preceding model, indicating that, besides the control variables, both privacy concerns and PoO affect the perceived value of Facebook information. Specifically, all predictors except for the possession of a copy of the PI influenced the valuation of PI (Table 5).

Privacy concerns explained a unique 5% of the variance in valuation of PI over and above that of the controls ($F \text{ change}(1, 1097) = 60.67$, $p = .000$). However, psychology of ownership improved the model even further ($F \text{ change}(1, 1096) = 129.10$, $p = .000$) and explained a unique 9% of the variance in valuation of PI. This finding reconfirms hypothesis 2, but it also adds further evidence for the importance of PoO in explaining the valuation of PI. Participants who build more PoO towards their PI valued it more. In our data set, PoO explains almost twice the amount of variance that privacy concerns explain. Finally, when all things are held constant, the asset consciousness priming was also a significant predictor for PI valuation. Participants who were primed for asset consciousness by receiving the third party scenario declared a higher valuation for their PI. This finding additionally proves hypothesis 3. The entire model explained 25% of the variance in PI valuation ($R^2 = .25$). Table 5 summarizes these results.

Table 5. Results of the Linear Regression Isolating the Influence of Privacy Concerns and PoO on PI

Predictor	B	SE	β	B	SE	β	B	SE	β
	Step 1			Step 2			Step 3		
Constant	4.27	.30		2.24	.39		1.44	.37	
Asset consciousness priming	.18	.15	.04	.28	.14	.06	.28	.14	.06*
Brand liking	.26	.05	.15***	.36	.05	.21***	.12	.05	.07*
Number of friends (up to 100)									
100 to 200 friends	.44	.20	.08*	.44	.20	.08*	.20	.19	.04
200 to 350 friends	1.22	.21	.22***	1.14	.20	.20***	.73	.19	.13***
Over 350 friends	1.62	.22	.27***	1.56	.21	.26***	.82	.21	.14***
Have a copy of PI	.06	.04	.05	.05	.04	.04	.06	.04	.04
Privacy concerns				.33	.04	.23***	.27	.04	.19***
Psychology of ownership							.58	.05	.36***
R ² change			.11***			.05***			.09***
adjusted R ²			.11***			.16***			.25***

Note. : B=estimated coefficient; SE = standard error; * $p < .05$; ** $p < .01$, *** $p < .001$
 Depended variable : valuation of PI; N=1031 (Conditions 1, 2, 3 and 4)
 Adjusted R²=.25; F=126.83; p=.000

Findings on the Relationship between Psychology of Ownership, Privacy Concerns and Sense of Loss for Deleted Personal Information

Finally, we took a third perspective on people's valuation of their PI by asking them to what extent they would regret if Facebook deleted their PI on the platform. Surprisingly, but in line with our findings above, across groups the (anticipated) regret for lost PI was extremely low ($M = 3.10$, $SD = 2.19$). The regret over deleted PI was significantly correlated with the valuation of one's PI (Spearman's $Rho = -.227$,

$p=.000$) and with WTP to protect that PI (Spearman's $Rho=-.337$, $p=.000$). From another angle, this finding confirms our findings above: most people seem to value their PI on Facebook very little.

Again, we conducted a stepwise multiple regression analysis with the regret of loss for deleted PI as the outcome variable, the covariates entered in the first step, the privacy concerns in the second step, and the psychology of ownership in the third step of the analysis (Table 6).

Unlike in previous regressions, privacy concerns did not contribute to explaining the anticipated regret over lost PI. The second step of the analysis was not a significant improvement of the model ($F(1,1007)=.34$, $p=.562$). This finding is surprising because people who are more concerned about privacy should rationally desire to see their PI deleted, given the long term risks of the PI being abused. (This rationale has been offered by Mayer-Schönberger (2009)). However, in our data set, privacy concerns had no telling impact on the sense of loss for lost PI. Additionally, our manipulation had no direct effect on regret over lost PI. Among the control variables, however, positive feeling towards the brand, number of friends (for participants with over 350 friends), and possession of a copy of the PI remained significant predictors.

In contrast to privacy concerns, PoO was a significant predictor. It explained 5% (R^2 change = .048) of the variance in regret for lost PI, over and above the other predictors. This finding again underlines the place of PoO as a core factor behind PI valuation (especially in comparison to privacy concerns). In addition, this finding provides insight into the mechanisms behind PoO's influence on valuation of PI by adding emotional dimensions to the construct: anticipated disappointment and feelings of loss for deleted information. People who felt a greater sense of ownership for their PI anticipated a greater sense of disappointment if that PI was deleted or lost.

Table 6. Results of the Linear Regression Analyzing the Relationship between PoO, Privacy Concerns, and the Anticipated Regret over Deleted PI

Predictor	Step 1			Step 2			Step 3		
	B	SE	β	B	SE	β	B	SE	β
Constant	11.72	.26		11.82	.35		12.35	.35	
Asset consciousness priming	.04	.13	.01	.03	.13	.01	.04	.13	.01
Brand liking	-.25	.04	-.16***	-.25	.05	-.17***	-.10	.05	-.07*
Number of friends (up to 100)							12.35	.35	
100 to 200 friends	-.29	.17	-.06	-.29	.17	-.06	-.13	.17	-.03
200 to 350 friends	-.47	.18	-.09**	-.47	.18	-.09**	-.18	.18	-.04
Over 350 friends	-.89	.19	-.17***	-.89	.19	-.17***	-.40	.20	-.07*
Have a copy of PI	-.37	.03	-.31***	-.37	.03	-.31***	-.37	.03	-.32***
Privacy concerns				-.02	.04	-.01	.03	.04	.02
Psychology of ownership							-.38	.05	-.26***
R2 change			.16***			.00			.05***
Adjusted R2			.16***			.16***			.21***

Note. : B=estimated coefficient; SE = standard error; * $p<.05$; ** $p<.01$, *** $p<.001$

Depended variable : anticipated regret for deleted PI; N=1009 (conditions 1, 2, 3 and 4)

Adjusted R2=.21; F=60.25; $p=.000$

Discussion

In this study, we asked Facebook users how much they value their PI on the platform. Our first result is that, depending on the experimental condition, 39-64% of the participants were not ready to pay a single cent for their entire PI on Facebook. 69% said that they would not regret if Facebook deleted all of their information. Only 34% indicated that they perceived their Facebook PI as valuable. 56% do not think that

their privacy is threatened or are unsure. These figures will seem counterintuitive to all those who regard Facebook as highly privacy invasive and to those who attribute high financial values to the platform. So what does our data suggest is really happening?

Our data suggests that somebody who is more privacy concerned is *not* necessarily likely to value his or her personal information more. However, at the moment that people learn that their PI is actually traded as an asset, privacy becomes a significant and important driver for PI valuation. And this is true even when a person is assured that the recipient is ‘trustworthy’. This finding is further reinforced by the fact that 94% of our participants said that they think twice before revealing something on the platform.

Our sample hardly posts sensitive information, self-selects to answer online questionnaires and is on average not very concerned about privacy. Yet, even here, privacy concern drives PI valuation in a market-aware setting. This result suggests that personal data markets need to take privacy concerns very seriously. So far, most people do not know that their PI is being traded. But the moment they learn about these flourishing markets, they will probably be reluctant to provide their asset for free. That said, our sample’s relatively low privacy concern is also a drawback, because we could only observe people who have a Facebook account and participate in online questionnaires. For highly concerned users who do not have a Facebook account for privacy reasons, PI could potentially be an asset per se. More research is needed to clarify this point.

While our data supports the importance of privacy concerns once personal data markets are established, it clarifies the ‘privacy relevance assumption’ of former research by showing that other constructs influence people’s perception of their PI as well, notably asset defense behavior and psychology of ownership. Our results clearly show that, when people are primed with the information that another party is interested in their PI, they behave in a way that is similar to how children behave in certain situations: they are more reluctant to share. Suddenly, the average price they want for their PI is on average 3.4 times higher than if they are not informed of an interested commercial partner.

In line with the behavior of valuing something more that is desired by others, we found that people on Facebook build up psychology of ownership for their PI. In an earlier study, we found that some activities on Facebook, such as diary keeping or posting constantly, positively drives people’s valuation of their PI on the platform (Bauer et al. 2012). However, besides these two individual behaviors, none of the other wide usage potentials of the platform was significant in explaining WTP. We therefore built the theory that the more general and psychologically proven construct of psychology of ownership could explain WTP. And indeed, many participants in our study feel at home on Facebook, identify with their profile and feel efficacious through their PI. This perception again acts as a major motivator of information valuation. In fact, PoO is more important for people’s appreciation of their PI on Facebook than privacy concerns are, and it is relevant regardless of whether personal data markets exist. PoO also motivates people to retain their PI. While privacy concerns seem irrelevant for data deletion, PoO makes people want to keep their data. Companies like Facebook, who view their users’ PI (particularly PI that is voluntarily provided) as an intangible asset, should therefore watch their users’ PoO. It is an important variable indicating people’s propensity to stay on a platform, but also to care about what is happening to their data. Unfortunately, we know very little about PoO for PI. This study is the first attempt to better understand and measure it. We believe that more research into the PoO for PI would be worthwhile.

A challenge for future research is how PoO can be grasped for data that people never volunteer, but that is passively observed or inferred (such as data from transaction logs, video surveillance, location information, and so on). We wonder whether people can perceive any kind of PoO for this kind of data, as the psychological mechanisms for building it up are not given. We believe that PoO can trigger natural privacy defense from people in personal information markets. People who have a strong PoO will strive to be at the negotiating table. The awareness alone that they own something of economic value can make them more cautious about disclosing it.

Finally, industry can learn from this study. Players in information markets should be aware of people’s privacy concerns, asset defense behavior as well as psychology of ownership. If people are not granted the ability to exercise information protection rights in the face of their data being traded on markets, some of those who share today will probably mount the barricades. What Facebook can learn from this study is that they should be very careful about secondary uses of the PI they collect. Psychology of ownership is one of the most significant measures for the long-term stability of their user base. If people self-identify

with their profiles, feel at home on Facebook and feel self-efficacious, they will not switch to another platform and invest themselves into that platform.

We acknowledge that the majority of our sample stems from German speaking European countries and may therefore be culturally biased. Potentially it would be of value to replicate the study in Anglo-Saxon and Asian cultures.

Conclusion

Entrepreneurs have long understood that comprehensive user profiles are the most important asset in the information economy. In particular, online social networks build their business models entirely on this asset. Information markets trading users' personal information flourish. Although these markets would not exist without users providing their personal information abundantly, users are not asked to the negotiation table. As people typically provide their information for free, it appears at first sight as if they either barely value their personal information or are not aware that this information constitutes an asset.

In our experimental study, we show that a simple indication of some third party being interested in one's personal information (an asset consciousness prime) affects people's behavior: They start to defend their privacy and their information assets. The study reveals that as soon as people learn that a market exists for their personal information, they value it on average 3.4 times higher than people who do not have this information.

In addition to asset consciousness, our work introduces a new construct termed 'psychology of ownership' to information valuation research. Psychology of ownership reflects people's possessive feelings towards a target. While the construct of psychology of ownership has typically been applied to physical objects, we have transferred it here to an online setting, analyzing whether people develop a sense of ownership with respect to personal information on a social network like Facebook. Our study demonstrates that this construct applies to personal information and that people develop a feeling of ownership towards the personal information they provide on Facebook. Most importantly, we show that psychology of ownership perceptions are at least as important as privacy for PI valuation, if not more so. We therefore put the privacy assumption into perspective when it comes to the investigation of people's reaction to data markets.

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APPENDIX – QUESTIONNAIRE

Psychology of ownership (self constructed) second order construct Cronbach alpha =.874 Variance explained 69.4%					
Psychology of ownership, first order construct: feeling at home (self-constructed)					
Item	Scale	Factor loadings			Cronbach alpha
H1: On my Facebook profile I feel a bit at home.	1 strongly agree – 9 strongly disagree	.747	.150	.179	.826
H2: I feel connected to my Facebook profile.	1 strongly agree – 9 strongly disagree	.767	.264	.233	
H3: I like my Facebook profile.	1 strongly agree – 9 strongly disagree	.773	.214	.093	
H4: I like being part of the Facebook community.	1 strongly agree – 9 strongly disagree	.785	.190	.125	
Psychology of ownership, first order construct: identity construction (self-constructed)					
Item	Scale	Factor loadings			Cronbach alpha
IC1: I like that Facebook gives me the possibility to make a good impression on others	1 strongly agree – 9 strongly disagree	.147	.225	.846	.877
IC2: I use Facebook to present myself in good light.	1 strongly agree – 9 strongly disagree	.180	.179	.852	
IC3: For me it is important that I present myself well on Facebook.	1 strongly agree – 9 strongly disagree	.194	.157	.858	
Psychology of ownership, first order construct: efficacy (self-constructed)					
Item	Scale	Factor loadings			Cronbach alpha
EFF1: I believe that my Facebook profile stands out positively among other Facebook profiles.	1 strongly agree – 9 strongly disagree	.203	.773	.166	.819
EFF2: I think that I set high standards for Facebook profiles with my profile.	1 strongly agree – 9 strongly disagree	.266	.762	.125	
EFF3: I feel that I increase the quality of Facebook.	1 strongly agree – 9 strongly disagree	.079	.787	.222	
EFF4: I am sure that I contribute a lot to Facebook.	1 strongly agree – 9 strongly disagree	.336	.683	.148	
Privacy concerns (Krasnova et al. 2009) and self constructed second order construct Cronbach alpha =.873 Variance explained 73.8%					
Privacy concerns, first order construct: organizational threats (Krasnova et al. 2009)					
Item	Scale	Factor loadings			Cronbach alpha
OT1: I am often concerned that Facebook could store my information for the next couple of years.	1 strongly agree – 9 strongly disagree	.845	.164	.126	.910

OT2: Every now and then I feel anxious that Facebook might know too much about me.	1 strongly agree – 9 strongly disagree	.778	.282	.134	
OT 3: I am often concerned that Facebook could share the information I provide with other parties (e.g., marketing, HR or government agencies).	1 strongly agree – 9 strongly disagree	.864	.135	.089	
OT 4: I am often concerned other parties (e.g., marketing, HR, governmental agencies) could actually collect my publicly available information on Facebook.	1 strongly agree – 9 strongly disagree	.817	.127	.214	
OT 5: It often worries me that other parties (e.g., marketing, HR, governmental agencies) could use the information they have collected about me from Facebook for commercial purposes.	1 strongly agree – 9 strongly disagree	.834	.119	.161	
Privacy concerns, first order construct: social threats (Krasnova et al. 2009)					
Item	Scale	Factor loadings			Cronbach alpha
ST1: I am often concerned that someone might purposefully embarrass me on Facebook.	1 strongly agree – 9 strongly disagree	.196	.200	.900	.870
ST2: It often worries me that other users might purposefully write something undesired about me on Facebook.	1 strongly agree – 9 strongly disagree	.203	.181	.903	
Privacy concerns, first order construct: accessibility (self-constructed)					
Item	Scale	Factor loadings			Cronbach alpha
ACC1: It often worries me that I do not restrict the access to my Facebook profile properly for some people.	1 strongly agree – 9 strongly disagree	.266	.738	.142	.750
ACC 2: There a people among my friends lists, who should actually not be able to see my Facebook profile.	1 strongly agree – 9 strongly disagree	.109	.789	.079	
ACC 3: My Facebook friends could gain information about me from by Facebook profile that should actually not be public.	1 strongly agree – 9 strongly disagree	.131	.759	.202	
Brand: trust and competence Items 1 to 6 (Sichtmann 2007); item 7 (Li et al. 2008); item (self constructed) Variance explained 53.6%					
Item	Scale	Factor loadings			Cronbach alpha
B1: Facebook is responsible.	1 strongly agree – 9 strongly disagree	.750			.876
B2: Facebook is reliable.	1 strongly agree – 9 strongly disagree	.766			
B3: Facebook is trustworthy.	1 strongly agree – 9 strongly disagree	.742			
B4: Facebook is dependable.	1 strongly agree – 9 strongly disagree	.726			
B5: Facebook is very competent.	1 strongly agree – 9 strongly disagree	.742			
B6: Facebook has outstanding qualifications in the social network business.	1 strongly agree – 9 strongly disagree	.639			
B7: The quality of Facebook has been very consistent.	1 strongly agree – 9 strongly disagree	.741			

B8: Considering all my Facebook experience, I am satisfied/unsatisfied.	1 very satisfied – 9 not satisfied	.746	
Have a copy of PI (self-constructed)			
Item	Scale	Factor loadings	Cronbach alpha
HC1: If I wanted, it would be easy for me to re-provide all my Facebook information.	1 strongly agree – 9 strongly disagree	.636	.621
HC2: A have a copy from a lot of my Facebook profile information (photos,...).	1 strongly agree – 9 strongly disagree	.790	
HC3: Since I have a copy from most of my information, it would not be bad if Facebook deleted information.	1 strongly agree – 9 strongly disagree	.831	