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DISTINGUISHING USAGE AND DISCLOSURE INTENTIONS IN PRIVACY RESEARCH: HOW OUR TWO SELVES BRING ABOUT DIFFERENCES IN THE EFFECTS OF BENEFITS AND RISKS

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Research

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Abstract

Two different conceptualizations of behavioral intentions are oftentimes interchangeably used as dependent variables in privacy research: Intentions to disclose personal information to an information system (IS) and intentions to use an IS (and thereby disclose information). However, the assumption that those two conceptualizations are indeed interchangeable has not been tested yet and, if rebutted, imposes limitations when comparing and integrating results of studies using either of them. By transferring the multiple selves problem to IS privacy research, we develop theoretical arguments and provide empirical evidence that those two intentions are a) conceptually different and b) formed in different cognitive processes. A vignette-based factorial survey with 143 participants is used to show, that while risk perceptions have more impact on disclosure intentions than on usage intentions, the opposite holds for hedonic benefits.

Keywords: disclosure intention, hedonic benefits, multiple selves problem, information privacy, privacy calculus, usage intention, utilitarian benefits.

1 Introduction

A vast amount of IS privacy literature deals with the question, under which circumstances people are willing to have their personal information gathered and processed by information systems (IS). As disclosure behavior is oftentimes difficult to observe and measure, these studies regularly rely on self-reported behavioral intentions, making them one of the most commonly used dependent variables in privacy research (Smith et al., 2011). However, while some researchers employ the *behavioral intentions to disclose personal information* (e.g., Keith et al., 2013; Li et al., 2011; Malhotra et al., 2004; Xu et al., 2009) others make use of the *behavioral intentions to use a privacy-invasive IS* (e.g., Sheng et al., 2008; Sledgianowski and Kulviwat, 2009). Some studies even mix survey items targeted towards usage with items targeted towards disclosure (e.g., Chellappa and Sin, 2005; Xu and Teo, 2004; Zhou, 2011). Furthermore, some studies aiming to build theory to explain usage intentions build upon findings targeting disclosure intentions (Sheng et al., 2008) and vice versa (Zimmer et al., 2010a).

Yet, although addressing the same behavior, using these conceptualizations interchangeably might lead to confounding research results. In particular, the emphasis on the act of information disclosure when people are asked for their *intentions to disclose personal information* may result in a relatively more deliberate answer. The conceptualization of the *intention to use a privacy-invasive IS* in contrast puts less emphasis on the act of disclosure and may therefore evoke different responses. This is problematic, because findings based on one of the conceptualizations may differ from those based on the

other, thus imposing limitations when comparing or integrating results of studies using either of them or even (inadvertently) mixing them. Therefore, we address the following two research questions:

RQ1: Are the behavioral intentions to disclose personal information conceptually different to the behavioral intentions to use a privacy-invasive IS?

RQ2: How does the formation of the behavioral intention to disclose personal information differ from the formation of the behavioral intention to use a privacy-invasive IS?

We contribute to the elucidation of the first research question by showing (based on a factor analysis) that the *intention to disclose information* and the *intention to use a privacy-invasive IS* are in fact statistically distinguishable. We further investigate *why* this is the case and develop a theory regarding the formation of those two behavioral intentions: Drawing upon the privacy calculus theory (Li, 2012) and the multiple selves problem (Bazerman et al., 1998), we argue, that different cognitive processes underlie the formations of *intentions to disclose personal information* and *intentions to use a privacy-invasive IS* and they are therefore formed differently. Based on the results of a vignette-based factorial survey among 143 participants, we provide empirical evidence that the perceived risk of information disclosure has a stronger impact on the behavioral intention to disclose information than on the intention to use a privacy-invasive IS. The opposite holds for hedonic benefits provided by the IS, which have more influence on the intention to use the IS than on the intention to disclose information to it.

The remainder of the paper is structured as follows: We first outline the theoretical background for our study by transferring the multiple selves problem to IS privacy research and thereby develop theoretical arguments that the two intentions are formed in different cognitive processes (and are therefore different). Thereafter we describe the methodology employed to investigate the deduced hypotheses followed by the presentation of our findings. RQ1 is investigated with a factor analytical approach, which is followed by the net regression approach proposed by Cohen et al. (2003) to examine RQ2. After the discussion of the results, the paper closes with a depiction of limitations of our study and promising fields for future research.

2 Theoretical Background

2.1 Conceptual Differences between Privacy-Related Behavioral Intentions

Information systems regularly require their users to have personal information gathered and processed by the system. Thus, one of the prevalent questions in IS-privacy literature is under which circumstances people are willing to accept this invasion of their privacy. As real behavior is oftentimes difficult to observe and measure, privacy research is regularly relying on self-reported behavioral intentions as an indicator of actual disclosure (Smith et al., 2011). However, besides the conceptualization of *behavioral intentions to disclose personal information* and asking people for the extent to which they would reveal their personal information (e.g., Malhotra et al., 2004; Xu et al., 2009; Zimmer et al., 2010b), privacy researchers also utilize *behavioral intentions to use a technology* as outcome of interest, asking people whether they would use a service or a technology (e.g., Sheng et al., 2008; Sledgianowski and Kulviwat, 2009). Some publications are even mixing items of these two conceptualizations of behavioral intentions. For example Xu and Teo (2004) measure the "intentions to use a LBS [location-based-service]" by asking for the extent to which people agree to statements like "I would disclose my personal information to use this type of LBS from the service provider in the next 12 months" but also "I intend to use this type of LBS in the next 12 months" (Xu and Teo, 2004, p. 801). Furthermore, some papers investigating the *behavioral intentions to use a privacy-invasive IS* build upon results found for the *behavioral intentions to disclose personal information* in their theory development (e.g., Sheng et al. (2008) investigate the "Intention to Adopt" a personalized ubiquitous-computing-system and build upon Malhotra et al. (2004), who are studying the "Intention to Give Information" in return for a free membership worth 50$) and vice versa (Zimmer et al., 2010a).

The underlying assumption of this tantamount utilization of the two conceptualizations seems to be, that they are conceptually equivalent. A reason why this assumption prevails might be, that in the IS privacy context, information is usually disclosed while using a privacy-invasive IS, which is why the intentions are somewhat interlinked. However, Bazerman et al. (1998) have found that although intentions may be interlinked by referencing the same set of options, individuals often evaluate these options from two different perspectives, "almost as if they are comprised of two competing selves: a *want self* and a *should self*" (Bitterly et al., 2014, p. 2). While the latter can be described by adjectives like rational, cognitive, thoughtful and "cool headed", the former is relatively more emotional, affective, impulsive and "hot headed" (Bazerman et al., 1998). These two selves coexist in individuals even though they differ with regard to their preferences. While the *want self* is attracted by the realization of immediate benefits, the *should self* is more far-sighted and interested in maximizing long term outcomes (Milkman et al., 2008; Milkman et al., 2009; Thaler and Shefrin, 1981). For example Schelling (1985) notes that "everybody behaves like two people, one who wants clear lungs and long life and the other who adores tobacco, or the one who wants a lean body and the other who wants dessert […]". Based on these findings, a characterization of when two options differ in their attractiveness for the *want self* and the *should self* can be obtained by comparing the short- and long term utility of the options. Given these two time periods and two options, one option has relatively more *want* and less *should* characteristics when this option is associated with greater utility in the short term but less utility in the long term compared to the *should* option (Milkman et al., 2008).

The decisions people face when they are asked for their behavioral intentions towards a privacy-invasive IS fit this scheme of *want* and *should* options. The option with the higher utility in the short term often is to use an IS and disclose personal information, because it allows to realize utility in the forms of monetary or time savings, pleasure, self-enhancement or social adjustment (Tam et al., 2002). However, by giving up privacy, a person loses the control over his personal information. According to Acquisti and Grossklags (2003), "That loss of control multiplies, propagates, and persists for an unpredictable span of time. […] For example, a small and apparently innocuous piece of information might become a crucial asset in the right context." Not using the IS and thereby maintaining one's privacy thus "… represents something akin to getting an insurance against future and only uncertain risks" (Acquisti, 2004, p. 25). Therefore, in the long term perspective the disclosure of information coming with the usage of a privacy-invasive IS is oftentimes inferior compared to maintaining one's privacy. Thus, non-disclosure is the *should* option compared to using the IS (*want* option).

The two conceptualizations of behavioral intentions as *intentions to disclose personal information* and *intentions to use a privacy-invasive IS* differ with regard to how central the disclosure of information is to the concept. While the former directly and exclusively addresses the act of disclosure itself, the behavioral intention puts more emphasis on the functionalities of the respective technology while moving the awareness away from the act of disclosure and considering it more as subordinate aspect of usage. As a consequence, when an individual is asked for its intention to use a privacy-invasive IS, there is no strong *should* option, because the negative long term effects are not central to the construct and therefore less likely to be applied in judgment (Roese and Sherman, 2007). In this case, the *want* self can follow his "own" preferences without being restricted by the *should* self. On the other hand, when one is asked for one's intention to disclose personal information, the focus on the potentially negative consequences in the long term makes it obvious that the decision is between a *should* and a *should-not* option. Research has shown that in cases were individuals are aware of the fact that the decision is a choice between *should* and *should-not,* the decision is affected strongly by the *should* self (Bazerman et al., 1999; Hsee, 1996; Okada, 2005). As a consequence, when the intention to disclose personal information and the intention to use a privacy-invasive IS are formed by different selves with different preferences, they also represent different concepts. Our hypothesis regarding RQ 1 therefore is the following.

H1: The intention to disclose personal information and the intention to use a privacy-invasive IS are statistically distinguishable constructs.

2.2   Want- and Should-Self in the Privacy Calculus

To further elaborate why the two behavioral intention differ, we consider their formation (RQ2). We therefore integrate differences in the preferences of the want and *should self* into the privacy calculus theory (Laufer and Wolfe, 1977). This theory posits, that when individuals are faced with the decision between giving up and maintaining their privacy, they undertake trade-offs whether a certain loss of privacy is acceptable for the benefits gained in exchange (Laufer and Wolfe, 1977). The central constructs of privacy calculus theory are *perceived benefits* and *risks of information disclosure*, which are weighted against each other and result in a *behavioral intention (to disclose personal information* or *to use a privacy-invasive IS* respectively) (Li, 2012; Smith et al., 2011). Thus, regarding the formation of usage and disclosure intentions, privacy calculus theory suggests that both are influenced by the same set of antecedents. However, due to the different preference structures of the *want self* and the *should self*, each antecedent can be of a certain importance to the *want self* and of a certain importance (which might be equal, higher or lower) to the *should self*. A lower importance of an antecedent should result in a smaller effect of this antecedent on the decision outcome. The goal of the following section is to discuss the importance of the *perceived risk of information disclosure* and *perceived benefits of information disclosure* (Li, 2012; Smith et al., 2011) for the *want self* and the *should self*, and thereby deduce hypotheses about differences between their effects on the *behavioral intention to use a privacy-invasive IS* (formed by the *want self*) and the *behavioral intention to disclose personal information* (formed by the *should* self).

As the importance of each antecedent for *want* and *should self* determines its magnitude of effect on the two behavioral intentions, the question is what type of antecedents are important to the two selves. As noted in the previous section, the *want self* is attracted by the realization of immediate benefits while the *should self* is more far-sighted and interested in maximizing long term outcomes (Milkman et al., 2008; Milkman et al., 2009; Thaler and Shefrin, 1981). Thus, if an antecedent determines the degree to which a decision is associated with positive utility in the short term, it is always important to the *want self*. However, from a rational perspective (which is reflected by the *should* self) people are often unsure whether utility that is not of practical character, but comes in the form of enjoyment or other hedonic pleasures, is a legitimate choice criteria. The *should self* therefore tends to hesitate to appreciate attributes determining such hedonic utility and only considers attributes of practical matter (Okada, 2005). On the other hand, antecedents representing potentially negative long term consequences that come with the realization of an immediate benefit have been found to be more important to the *should self* than they are to the *want self*, because people frequently feel they *should* make decisions that maximize their long term utility, even when they have to forego short term benefits (Milkman et al., 2008). Against this background we first examine the importance of the *perceived risk of information disclosure* (H2) for the two selves and then proceed with the *perceived benefits of information disclosure* (H3 and H4).

The *perceived risk of information disclosure* is defined as "[…] the expectation of losses associated with the release of personal information […]" (Xu et al., 2009, p. 149). This refers to the potential of significant losses in the future, may it be due to data leaks or intentional misuse of the data by the provider it was intentionally disclosed to. Thus, the perceived risk of information disclosure determines the extent to which negative long term consequences are anticipated and is therefore more important in the preference structure of the *should self* than it is in that of the *want self*. As a consequence the negative effect of the perceived risk of information disclosure on the behavioral intention to disclose personal information (formed by the *should self*) should be stronger than the negative effect on the intention to use a privacy-invasive IS (formed by the *want self*). This is reflected in the following hypothesis:

H2: The perceived risk of information disclosure has a stronger negative impact on the reported intention to disclose personal information to the provider of a privacy-invasive IS compared to the impact on the reported intention to use the IS. ($\beta_{R\text{-}IU} > \beta_{R\text{-}ID}$)
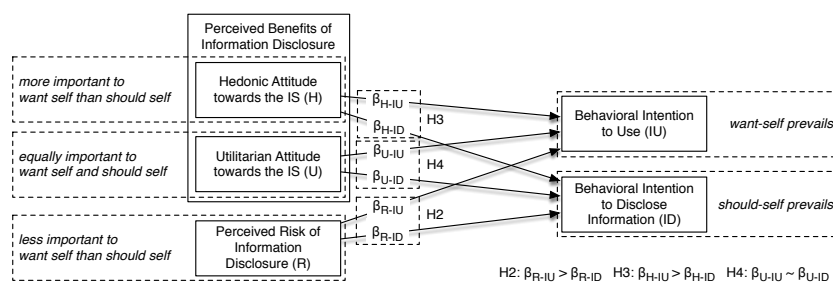
Figure 1   Research Model

To categorize *perceived benefits of information disclosure* and derive the research model depicted in Figure 1, one more distinction has to be made. As noted before, not all utility is equally important to the *want* and *should* self (Chitturi et al., 2007): An antecedent determining the positive utility in the short term is always important to the *want self*, but it is only important to the *should self*, if the underlying utility is of practical character and therefore appears to be rational (Okada, 2005). The one-dimensional conceptualization of benefits in the privacy calculus does not distinguish different types of benefits in this regard. Theories from the area of hedonic consumption (Hirschman and Holbrook, 1982) are more precise by distinguishing the *utilitarian* and the *hedonic* benefits provided by a product. The former denotes the capability of a product to fulfil pragmatic goals and accomplish functional tasks (Strahilevitz and Myers, 1998). The hedonic quality of a product serves more emotional needs for multisensory experiences and pleasure (Hirschman and Holbrook, 1982). We thus extended the basic privacy calculus model by re-conceptualizing the one-dimensional construct of perceived benefits with the hedonic and the utilitarian attitude towards the IS (see Figure 1) to account for the different effects of hedonic and utilitarian benefits (Voss et al., 2003). We use attitudes instead of concrete beliefs about benefits in this study, because a certain benefit, for example a chatting functionality, is likely to contain utilitarian and hedonic aspects (like enabling exchange of information and satisfaction of communication needs) (Alba and Williams, 2013). In most privacy studies, however, benefits are assessed by measuring in how far a system provides certain functionalities, for example by asking people for their agreement to statements like "I get to know new people through the OSN [Online Social Network]" (Krasnova et al., 2010). Thus, attitudes allow differentiating the two dimensions of benefits with greater accuracy (Babin et al., 1994; Batra and Ahtola, 1991; Ja-Chul et al., 2010).

Although people intrinsically value hedonic benefits and *want* to incorporate them in their decisions (Okada, 2005), those hedonic benefits tend to "[…] be more difficult to evaluate and quantify than the practical, functional benefits […]" (Okada, 2005, p. 44). As a consequence, the *should* self tends to hesitate to consider the hedonic dimension of benefits due to their subjectivity and irrationality (Okada, 2005). This means hedonic product benefits are more relevant to the *want* self compared to the *should* self. Given that the intention to use is evaluated from a *want* perspective while the intention to disclose is based on the preferences of the *should self*, the following hypothesis can be derived:

H3: The hedonic attitude towards an IS has a stronger positive impact on the reported intention to use a privacy-invasive IS compared to the impact on the reported intention to disclose personal information to the provider of the IS. ($\beta_{H\text{-}IU} > \beta_{H\text{-}ID}$)

The problem of lacking justifiability described above does not concern the utilitarian dimension of benefits. These are easier to quantify and thus considering them in a decision is not perceived as being unreasonable or a violation of one's ought's by the *should self* (Okada, 2005). As a consequence, utilitarian benefits provided by privacy-invasive IS are not only relevant for the *want self* but also for the *should self*. Thus, the degree to which these are taken into consideration is not affected by whether the *want self* or the *should self* prevails and the following hypothesis ensues.

H4: The utilitarian attitude towards an IS has the same positive impact on the reported intention to use a privacy-invasive IS and the reported intention to disclose personal information to the provider of the IS. ($\beta_{U\text{-}IU} \sim \beta_{U\text{-}ID}$)

3 Research Method

We employed a 2 (utilitarian benefit – high/low) x 2 (hedonic benefit – high/low) x 2 (risk – high/low) between-subjects scenario-based factorial survey design (Rossi and Nock, 1982) to investigate the relationships of the independent variables with the intention to disclose as well as the intention to use in an adoption decision of a fitness wristband as privacy-invasive IS. The scenario-based factorial survey approach is especially suitable for our research, because contextual variables have been found to have a strong influence on privacy-related decisions (Smith et al., 2011) and scenario-based factorial surveys allow to maintain a high degree of control over the independent and contextual variables and thereby minimize the effects of disturbance variables (Aviram, 2012; Finch, 1987; Xu and Teo, 2004).

A wearable technology was deliberately chosen as context for our study to control for cases in which disclosure of data is to some extent optional and no prerequisite for usage. In such situations the intention to use may exceed the intention to disclose personal information for other reasons than the multiple selves problem. For example, one could plan to provide fake data to a system and thus the intention to provide (real) data to an IS may be lower than the intention to use it. This is not possible in the context of wearable computing, because data is automatically collected by sensors. We targeted participants aged 16 to 24, because wearables were found to be most appealing to this age group (GfK, 2013) and contacted them via different sports clubs, university lectures and social media platforms.

3.1 Manipulation of Independent Variables

Our study was designed as online survey. The participants were first asked to provide demographic information. Afterwards they were instructed to imagine themselves to be in a situation in which they were confronted with a fitness-wristband possessing different features to manipulate the three independent variables: hedonic benefits, utilitarian benefits and risk. Using such a hypothetical scenario is a common approach in IS privacy research (Hann et al., 2007; Malhotra et al., 2004; Pan and Zinkhan, 2006). The features of the wristband in question were varied between participants in such a way that one participant only viewed one of the eight vignettes resulting from the 2 x 2 x 2 factorial design.

Either offering a reduced or an extensive set of practical functions manipulated the utilitarian benefit provided by the wristband. Hedonic benefits were manipulated by means of gamification. Gamification is "[…] the use of game design elements in non-game contexts" (Deterding et al., 2011, p. 10) to "enhanc[e] a service with affordances for gameful experiences in order to support user's overall value creation" (Huotari and Hamari, 2012, p. 19). While the wristband low on hedonic benefits did not incorporate gamification, the wristband high on hedonic benefits was gamified. Risk was manipulated via different data handling policies. All textual descriptions are given in Appendix 1.

3.2 Measurement of Independent and Dependent Variables

Established scales were used to measure all constructs. The perceived *utilitarian* and *hedonic attitudes towards the wristband* were measured with the scales developed by Voss et al. (2003). The former construct is defined as "[…] the portion of a person's attitude resulting from perceptions of the functional performance of the product […] or its expected performance" (Bruner et al., 2001, p. 187) while the latter relates to "[…] those facets of a product, that relate to the multisensory, fantasy and emotive aspects of one's experience with products" (Hirschman and Holbrook, 1982, p. 92). The items for the *perceived risk of information disclosure* were adopted from Xu et al. (2009).

The dependent variables are both behavioral intentions, which are defined as "[…] the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior" (Warshaw and Davis 1985, p. 214). In our case, the specified behaviors are (1) disclosing personal information and (2) using the privacy-invasive IS. The *behavioral intention to disclose personal information* was measured by an established scale asking respondents to specify the extent to which they would reveal their personal information using sematic differentials like unlikely/likely or unwill-

ing/willing (Malhotra et al., 2004; Wakefield, 2013; Xu et al., 2009). To measure the *behavioral intention to use the wristband* we employed the scale used by Sheng et al. (2008). An overview of all indicators is given in Appendix 2.

4　　Data Analysis and Results

We received a total of 207 completely filled out survey responses. Only participants that stated to do sports at least once a week were included in further analyses, because they represent the target group for the wearable presented in the scenarios. People not doing sports on a regular basis might also not be able to assess in how far the given technology is practical and thus have difficulties in estimating the utilitarian attitude towards it. This resulted in 143 responses that entered our analyses. The distribution of survey participants on the groups of the factorial design is shown in Table 1. Please note that nonorthogonal data, that is, an unequal number of observations per group, is unproblematic as we employ Cohen's net regression approach (Cohen et al., 2003; Cohen et al., 1990, see section 4.2) to analyze our data (Brown et al., 2011; Overall et al., 1975). There are more male participants in our sample (75.5%) than females (24.5%). The majority (51.0%) were between 20 and 24 years of age and 77% were in the age group of 17-24 years. The youngest participant was 17, the oldest 55 years of age.

risk	high		low	
hedonic benefits	high	low	high	low
utilitarian benefits　high	18	23	14	14
low	20	18	18	18

Table 1.　　*Distribution of participants on groups of the factorial design.*

4.1　　The Factor Structure of Disclosure and Usage Intentions (Hypothesis 1)

To test H1, we employed a factor-analytic approach to investigate the correlation structure between the items operationalizing the intention to use and those operationalizing the intention to disclose. This allows to investigate how many statistically distinguishable constructs are represented by our set of usage- and disclosure-related items (Gulliksen, 1968; Henson and Roberts, 2006). We first performed an exploratory factor analysis to investigate factor loadings. A confirmatory factor analysis was then performed to compare the fits of a single-factor and a two-factor model as described by Bagozzi and Yi (2012).

The Kaiser-Meyer-Olkin test of sampling adequacy (.88) (Kaiser, 1970) and Bartlett's test of sphericity (χ^2 = 2539.6, p < .001) (Bartlett, 1950) indicate that the data is suitable for factor analysis (Dziuban and Shirkey, 1974). Principal axis factoring was used as extraction method with the Kaiser criterion (Kaiser, 1960) to determine the number of factors to extract (those with eigenvalues > 1). This resulted in two factors, the first with an eigenvalue of 4.7 and explaining 67.3% of the overall variance and the second with an eigenvalue of 1.47 and explaining another 21.06% of the variance. The first factor that was not retained had an eigenvalue of .447. As usage of and disclosure of information to the wristband are interlinked, it is reasonable to expect the emergence two factors that are correlated. We thus used a promax rotation, as it is an oblique rotation method and does not force the factors to be uncorrelated (Gorsuch, 1983). The resulting factor pattern matrix is given in Table 2. The correlation between the two factors is .528.

All items targeted towards usage load strongly on the second factor (all > .94) while loadings on the first factor are all below .03. The items targeted towards disclosure on the other hand all load on factor one with loadings > .89 except for ID4 with a loading of .69. The loadings on factor two are .045 and lower. Thus, although using the wristband presented to the participants without disclosing personal information is not possible, the intentions to disclose personal information to its provider and the intention to use it seem to constitute two conceptually different constructs.

A confirmatory factor analysis (Jöreskog, 1969) was then employed to compare the fit of a single-factor and a two-factor model (Bagozzi and Yi, 2012). Therefore both models were estimated using SPSS Amos 22. Following the recommendations of Bagozzi and Yi (2012) we report the NNFI, CFI, RMSEA and SRMR for both models in Table 3. Values for the NNFI and CFI should exceed 0.95 to indicate good model fit (Hu and Bentler, 1999). This is given for the two-factor model. Values for the RMSEA should fall below .1 (MacCallum et al., 1996), which is slightly lower than the .11 obtained for the two-factor model. However, Kenny et al. (2014) have shown that the RMSEA underestimates model fit for models with low degrees of freedom (13 in our case), which is why we deem .11 acceptable. The observed value for the SRMR is well below the threshold of .08 (Hu and Bentler, 1999). The single-factor model clearly shows bad fit and violates all criteria for good model fit. Therefore, hypothesis 1 is supported. The intention to disclose personal information and the intention to use a privacy-invasive IS should be considered as two conceptually different constructs.

	Communalities	Factor 1	Factor 2
IU1	.919	.028	***.943***
IU2	.924	.008	***.957***
IU3	.961	-.008	***.984***
ID1	.876	***.943***	-.013
ID2	.893	***.961***	-.031
ID3	.846	***.895***	.045
ID4	.509	***.690***	.042

	Criterion for fit	Single-factor model	Two-factor model
NNFI	> .95	.32	.97
CFI	> .95	.55	.98
RMSEA	< .1	.53	.11
SRMR	< .08	.20	.03

Tables 2 and 3. Communalities and factor structure (principal axis factoring and promax rotation, left) & results of confirmatory factor analysis for single- and two-factor model (right).

4.2 Differences Between the Formations of Disclosure and Usage Intentions (Hypotheses 2-4)

To test hypotheses 2 to 4 we used the net regression method devised by Cohen et al. (1990). This method is applied here, because we do not want to test whether the effect of an independent on a dependent variable is significant, but whether the *difference between the effects* of one independent on two different dependent variables is statistically significant (see H2-H4). Cohen's net regression approach explicitly allows to test "[…] whether a set of predictors have, individually and collectively, a comparable relationship to two ore more different dependent variables in a single sample" (Cohen et al., 2003, p. 642). Thus, by employing net regression, the common practices of noting that an independent variable significantly influences one outcome but not the other, or "... that some estimate of magnitude of effect appears to be larger for one outcome than another, without assessment of the significance of these differences, can be avoided." (Brook et al., 1995, p. 87)

The approach consists of three steps: After standardizing all variables, a first regression is carried out to compute the regression coefficients for one of the dependent variables. Then the deviations between the data points measured for the second dependent variable and the corresponding values predicted by the regression equation for the first dependent variable are determined. If the effect of an independent variable on both dependent variables would be the same, this difference should not be dependent on this independent variable, If the difference is however significantly dependent on one of the independent variables, this means this variable has a significantly different influence on the two dependent variables. A second regression is therefore used to identify any structure in these deviations that can be attributed to the set of independent variables. If the coefficients in this regression turn out as significant, this means the independent variable has in fact a different effect on the two dependent variables (Cohen et al., 2003). Before carrying out the actual analysis, the validity of the applied measures and the successful manipulation of the independent variables by our scenarios were verified.

4.2.1 Validity of the Survey Instrument

The internal consistency of the constructs was evaluated by means of Cronbach's α. The results are shown in Table 4 along with descriptive statistics. A second factor analysis including all items and promax rotation was carried out to check convergent validity (Straub, 1989). All Items loaded higher on their intended construct than on any other with .271 as the highest cross loading. Inter-construct correlations can also be found in Table 4. A correlation of .613 between the utilitarian and the hedonic attitudes was found. However, variance inflation factors did not point to problematic multicollinearity between the independent variables during our regression analyses. All values were 1.956 or below (see Table 4) and therewith well below the proposed threshold of 10 (Cohen et al., 2003). Manipulation checks indicate successful manipulations of the perceived hedonic (F = 6.839, p = .01) and utilitarian (F = 3.564, p = 0.06) attitudes towards the wristband and the perceived risk (F = 7.288, p = .008).

	No. of Items	Mean	Std. Dev.	Cron-bach's α	utilitarian attitude (U)	hedonic attitude (H)	per-ceived risk (R)	intention to disclose (ID)	Variance inflation factors
U	5	4.512	1.273	.874					1.956
H	5	4.403	1.408	.875	.613				1.845
R	3	4.177	1.548	.863	-.167	-.117			1.082
ID	4	3.080	1.654	.938	.490	.424	-.385		
IU	3	4.457	1.987	.973	.625	.507	-.215	.487	

Table 4.   Descriptive statistics, Cronbach's α, variance inflation factors and correlations among all variables (IU = behavioral intention to use the wristband).

4.2.2 Net Regression Analysis

As depicted before, we employed a 2 (utilitarian benefit – high/low) x 2 (hedonic benefit – high/low) x 2 (risk – high/low) factorial survey design to generate variance in the independent variables. A common approach to analyze such data is dummy coding the group assignment for each factor. However, this only allows an analysis on the level of groups in the factorial design, because one would implicitly assume that all participants in one group perceived the same risk, hedonic attitude and utilitarian attitude towards the wristband. In line with Komiak and Benbasat (2006) and Keith et al. (2010), we used the manipulation check measures as independent variables instead, in order to analyze the data on the level of individual participants and thereby eliminate this shortcoming. This is also advantageous compared to using binary variables specifying the manipulation the participant was exposed to, because "[…] causation is conceived as a relation between variables or constructs in a theory and not between observed objects or events in the world. […] It is more sound theoretically to model cause and effect between theoretical variables which, in turn, are operationalized by measures of those variables" (Bagozzi, 1977, p. 211f.). This means that the behavioral intention is not influenced by the presence or absence of (for example) the gamification-feature, but by the hedonic attitude towards the product resulting from its presence or absence.

According to the net regression approach of Cohen et al. (1990) presented above, we first standardized all variables and computed a regression of the intention to disclose on our three independent variables to obtain the standardized regression weights of the hedonic attitude, the utilitarian attitude and the perceived risk ($\beta_{H\text{-}ID}$, $\beta_{U\text{-}ID}$ and $\beta_{R\text{-}ID}$ – see Figures 1 and 2). The result is shown as model 1 in Table 5. We also report the results of the regression of the intention to use on the three independent variables ($\beta_{H\text{-}IU}$, $\beta_{U\text{-}IU}$ and $\beta_{R\text{-}IU}$ – model 2 in Table 5), although this is not necessary for the approach.

The results show significant effects of those independent variables hypothesized to be more important to the *should self* (utilitarian attitude and perceived risk, see section 2.2) on the (*should self* dominated) intention to disclose. The effect of the hedonic attitude is insignificant, which is consistent with our

expectations. The intention to use the wristband seems to be determined primarily by the hedonic and utilitarian benefits. The effect of the perceived risk is weaker, but still significant at the 5%-level.

To examine whether those differences in regression coefficients are significant, we proceeded according to the net regression method (Cohen et al., 2003; Cohen et al., 1990). We used the regression coefficients obtained by regressing the intention to disclose to compute the vector of predicted values for the disclosure intentions. These scores were then subtracted from the measured values for the intention to use. A second regression was carried out with this difference as dependent variable and the same set of independent variables. The (unstandardized) coefficients of this regression now denote the difference between the independent variable's effect on the intention to use and the intention to disclose ($\beta_{H\text{-}IU}$ - $\beta_{H\text{-}ID}$, $\beta_{U\text{-}IU}$ - $\beta_{U\text{-}ID}$, $\beta_{R\text{-}IU}$ - $\beta_{R\text{-}ID}$) and their p-values denote whether the difference is significant (Cohen et al., 2003; Cohen et al., 1990). The result of this last regression is shown as model 3 in Table 5. Please note, that the beta coefficients of model 1 and the unstandardized coefficients of model 3 add up to the betas of model 2.

		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	SE	β		
Model 1 (dependent variable: intention to disclose - coefficients are $\beta_{*\text{-}ID}$)	R			-.307***	-4.492	< .001
	H			.122	1.362	.175
	U			.392***	4.261	< .001
	R = .631; R² = .398; AdjR² = .385					
Model 2 (dependent variable: intention to use - coefficients are $\beta_{*\text{-}IU}$)	R			-.134*	-2.062	.041
	H			.311***	3.665	< .001
	U			.383***	4.384	< .001
	R = .676; R² = .458; AdjR² = .446					
Model 3 (dep. var.: intention to use minus predicted values for intention to disclose (by model 1))	R (H2)	.173**	.065		2.669	.009
	H (H3)	.189*	.085		2.231	.027
	U (H4)	-.009	.087		-.104	.917
	R = .309; R² = .096; AdjR² = .076					

Table 5.   *Results of the net regression analysis (R = perceived risk of information disclosure, H = hedonic attitude, U = utilitarian attitude).*
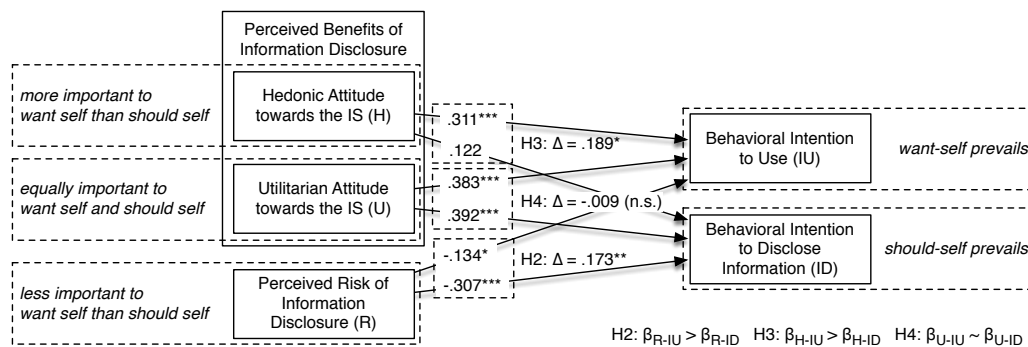

Figure 2.   *Research model with estimated regression parameters.*

This last regression allows us to make direct inferences about our hypotheses 2 to 4. The effect of the perceived risk of information disclosure increased from -.307 to -.134 between the regression of the intention to disclose and the intention to use, with the difference being significant according to model

3 ($\beta_{R\text{-}IU} - \beta_{R\text{-}ID}$ = .173[**], p = .009). The effect of the perceived risk on the disclosure intention is therefore stronger than on the usage intention and H2 is supported. The regression coefficient of the hedonic attitude towards the wristband is significantly higher when regressing the intention to use compared to when the intention to disclose is regressed. Therefore, our data supports H2 ($\beta_{H\text{-}IU} - \beta_{H\text{-}ID}$ = .189[*], p = .027). The difference between the impact of the utilitarian attitude towards the wristband on the intention to use and the intention to disclose is not significant according to model 3 ($\beta_{U\text{-}IU} - \beta_{U\text{-}ID}$ = -.009, p = .917) and thus supporting H3. An overview of the effects is depicted in Figure 2.

5   Discussion

The goal of our study was to prove the behavioral intention to use a privacy-invasive IS and the intention to disclose personal information to it to be different conceptualizations (RQ1) and represent outcomes of different types of deliberations (RQ2) despite being used interchangeably in research on privacy-invasive technologies (e.g., Chellappa and Sin, 2005; Xu and Teo, 2004). We examined the relationship between these two behavioral intentions in the context of a wearable technology, which stands out in respect to the linkage between usage and information disclosure. Despite this logical linkage, we found significant differences between the intention to use such a technology and the intention to disclose one's personal information to it. While the latter seems to underlie an evaluation taking into account mainly the perceived risk and utilitarian attitude towards the IS, the intentions to use a privacy-invasive IS are influenced primarily by the utilitarian as well as the hedonic dimension of attitudes towards an IS but neglecting the perceived risk.

The contributions of this study to IS privacy research are threefold. A first contribution is the distinction of the two conceptualizations of behavioral intentions. As we have shown, there exist profound differences between usage and disclosure intentions. This imposes important limitations when comparing or integrating results of studies using different intentions, because relationships found for the intention to disclose personal information might not necessarily also hold when investigating the behavioral intention to use privacy-invasive IS and vice versa. Future research should therefore be cautious when building theory from studies employing a different behavioral intention. The distinction of disclosure and usage intentions also raises the question, which behavioral intention is appropriate for which purpose in privacy research. While one intention might be better suited to analyze perceptions of people regarding privacy-invasive IS the other might fit better to predict actual behavior.

This question leads to our second contribution, the transfer of the distinction between *want* and *should* options (Bazerman et al., 1998) to the IS privacy context, and thereby the proposition of a new perspective on privacy-related cognitive processes. As we have shown, people seem to simultaneously hold different points of view regarding acts of information disclosure. This is in line with the multiple selves problem (e.g., Bazerman et al., 1998; Khan et al., 2005; O'Connor et al., 2002). These findings also support the notion of immediate gratification as having a strong impact on information disclosure behavior (Acquisti, 2004; Acquisti and Grossklags, 2005), as this phenomenon is typically considered to be a cause for the multiple selves problem (Bazerman et al., 1998). Given that research has found the *should self* to be more influential in advance of a decision, while the *want self* often prevails during the actual decision (O'Connor et al., 2002), this second contribution has implications for the question, which behavioral intention better predicts actual behavior. It is reasonable to assume, that the behavioral intention to use a privacy-invasive IS is a better predictor for actual behavior than the intention to disclose personal information in most contexts. This theoretical implication can also inform future research on the privacy paradox, a phenomenon describing a divergence between behavioral intentions and actual behavior oftentimes found in the privacy context (Norberg et al., 2007). One might assume, that the privacy paradox is more prominent when comparing actual behavior with a disclosure intention compared to a usage intention. However, an evaluation of predictive power of the two intentions for actual behavior was not the scope of this research project and thus these are only reasonable assumptions that should be investigated in future research.

The conceptualization of the benefits provided by a privacy-invasive IS as two-dimensional – this is in line with research on consumer attitudes (Batra and Ahtola, 1991; Voss et al., 2003) and hedonic consumption (Hirschman and Holbrook, 1982) – constitutes the third contribution. Based on this reconceptualization, we were able to show, that these dimensions have different impacts depending on the behavioral intention under consideration. This result could inform, for example, the traditional privacy calculus (Laufer and Wolfe, 1977) – with the intention to disclose personal information as dependent variable, more attention should be paid to the utilitarian qualities of the privacy-invasive IS under consideration, as the hedonic qualities might be considered less by potential users.

Apart from these theoretical contributions our results are also valuable for practitioners developing or offering privacy-invasive IS. With the knowledge that potential users weight risks and benefits differently depending on the prevalence of the *want* vs. *should self* during the evaluation of an IS, manufacturers can try to create conditions, that make people lean towards the one or the other. For example research has shown, that the shorter the time between purchasing a product and its delivery, the stronger people tend to follow their *want* preferences in the purchase decision (Milkman et al., 2010; Oster and Scott Morton, 2005). Another way to bolster the *want self* is presenting products separately instead of jointly with other alternatives. This avoids direct comparisons between alternatives and thus makes *should / should-not* options less obvious (Bazerman et al., 1999). Consumers on the other side should pay close attention to the context in which they evaluate a privacy-invasive IS. Relying too strongly on their *want self* and neglecting the doubts of the *should self* might result in an underestimation of risks and thus an underestimation of possible negative long term consequences.

6 Limitations and Future Research

The results of our study should be interpreted in consideration of its limitations. First of all, intentions in real-life situations might deviate from those observed in a hypothetical scenario. Although the use of vignette-based surveys and hypothetical scenarios is common in privacy research (Hann et al., 2007; Malhotra et al., 2004; Pan and Zinkhan, 2006) and this approach was chosen to create a controlled research setting and thereby guarantee a high internal validity, this high internal validity is on the other hand attended by a lower external validity (Taylor, 2006). The wearable technology we chose as context for our study to control for cases in which disclosure of data is to some extent optional limits our sample to people who exercise regularly. Furthermore, the study was conducted in Germany and the majority of participants were between 17 and 24 years of age. We deliberately chose this age group, because market researchers have identified 16 to 24 year olds to find wearable technology the most appealing (GfK, 2013), making them a suited target group for a first investigation of the multiple selves problem in the context of wearable devices. However, the generalizability of our findings is limited by these sample characteristics. Future studies should therefore try to replicate our results with more diverse and larger samples.

The divergence we found between usage and disclosure intentions calls for more research on privacy-related factors fostering either a *should*- or a *want*-perspective on the act of information disclosure. With the multiple selves problem in mind, the frequently investigated contextual factors like information sensitivity (Malhotra et al., 2004; Xu et al., 2008) or technological applications (Smith et al., 2011) should be investigated with regard to their impact on people's feelings concerning the need to justify their decisions and thus how strong they feel they *should* behave in a certain manner. Also societal norms and values might have an influence on this consideration resulting in larger or smaller divergences between usage and disclosure intentions. Apart from divergences between the two intentions themselves, future research might also investigate, how the two intentions relate to actual behavior, as both conceptualizations, albeit being different, are often used as tantamount predictors for the same behavior in current privacy research. The results obtained by our study might also serve as a foundation to refine the privacy calculus by considering the multidimensionality of benefits, the distinction between usage and disclosure intentions as well as the role of the multiple selves in the determination of these intentions.

Appendix

Utilitarian Benefit (low)	Utilitarian Benefit (high)
The wristband has several sensors like GPS, accelerometer and position-, pulse- and blood oxygen-sensors. In combination with a free smartphone app is it possible, to track the exertion levels during different sports activities. On leaving a certain pre-set pulse range, the wearer is notified by a vibration alarm und receives a notification via the linked smartphone.	The wristband has several sensors like GPS, accelerometer and position-, pulse- and blood oxygen-sensors. In combination with a free smartphone app is it possible, to track diverse sports activities. If an exercise is done technically wrong or with the wrong intensity, the wearer is notified by a vibration alarm und receives a tips to improve his training via the linked smartphone. In everyday life the wristband can be used to count steps or even monitor sleeping cycles and being woken up at the optimal time. Modern wireless technologies enable the wristband to be used as digital admission ticket.
Hedonic Benefit (low)	Hedonic Benefit (high)
[no further features]	The wearer of the wristband can collect points through certain behaviors. For example, exercising with a constant pulse or a high number of steps per day are rewarded with a digital badge. The smartphone-app allows access to the badges already gained and more available badges. At regular intervals the wearer is confronted with special tasks to achieve special badges, for example gain 25 meters in altitude in the next ten minutes.
Risk (low)	Risk (high)
All data recorded by the wristband are transferred to the provider's servers and stored in encrypted form. The data will not be disclosed to third parties.	All data recorded by the wristband are transferred to the provider's server and stored there. The provider reserves the right to analyze the data and provide third parties access to anonymized data.

Appendix 1.   Scenarios used to manipulate the independent variables.

Hedonic Attitude towards the Product - (Voss et al., 2003) 7-pt semantic differential		**Utilitarian Attitude towards the Product** - (Voss et al., 2003) 7-pt semantic differential	
H1	not fun / fun	U1	not effective / effective
H2	dull / exciting	U2	not helpful / helpful
H3	not delightful / delightful	U3	not functional / functional
H4	not thrilling / thrilling	U4	not necessary / necessary
H5	unenjoyable / enjoyable	U5	not practical / practical
Behavioral Intention to Use (Sheng et al., 2008) 7-pt Likert scale (agreement)		**Behavioral Intention to Disclose Personal Information** (Xu et al., 2009) 7-pt semantic differential	
When faced with this scenario, ...		ID1	Unlikely / Likely
IU1	... I intend to adopt this product.	ID2	Not probable / Probable
IU2	... I predict I will use this product.	ID3	Impossible / Possible
IU3	... I plan to use this product.	ID4	Unwilling / Willing
Perceived Risk of Information Disclosure - (Xu et al., 2009) 7-pt Likert (strongly disagree / strongly agree)			
R1	Providing the provider of the wristband with my personal information would involve many unexpected problems.		
R2	It would be risky to disclose my personal information to the provider of the wristband.		
R3	There would be high potential for loss in disclosing my personal information to the provider of the wristband.		

Appendix 2.   Measurement items.

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