Who needs privacy? Exploring the relation between personality and need for privacy

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Abstract

Privacy is an important societal topic. Living in an information age, people constantly have to decide what information to share, which service to use, when to communicate. All of these decisions are reflective of and determined at least in part by a person’s need for privacy. Understanding individual differences in need for privacy thus is a potentially important motivator of human behavior. Moreover, the nothing-to-hide statement—‘someone who has nothing to hide has nothing to fear’—implies that people who desire privacy are suspicious. Although such suspicions might be justified in some situations, there are many alternative legitimate explanations as to why a person desires privacy. For example, they could be more introverted, hesitant, creative, or prudent. The goal of this study is to explore the relation between personality and the need for privacy. Personality factors and facets will be operationalized using the HEXACO personality inventory. Need for privacy will be measured with a multidimensional approach, including need for informational and social privacy, need for privacy from government agencies, and need for privacy from companies. A sample of more than 800 respondents representative of the U.S. in terms of age, gender, and ethnicity will be collected to explore the relations between personality and privacy using structural equation modeling.

*Keywords:* Privacy, need for privacy, personality, HEXACO, structural equation modeling

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The increasing digitization of everyday life has catapulted privacy to become a major topic of public and academic interest. Yet despite the topic’s importance, to date we still know surprisingly little about the relation between privacy and personality (Masur, 2018, p. 155). This may be due to the fact that privacy is most often conceived as situational or contextual (Nissenbaum, 2010), but there is evidence that it is also dispositional to some extent (Pedersen, 1982). This study therefore seeks to understand how personality dimensions and facets relate to the need for privacy.

We believe it is relevant to address this question because people who desire privacy may be viewed suspiciously and called upon to justify their desire for privacy. For example, the argument that data mining and surveillance by government entities poses no threat to the privacy of law-abiding citizens, and is only problematic for people who are engaged in illegal activities who want to hide their information (Solove, 2007, p. 753), is known as the nothing-to-hide argument. Summarized as “If you have nothing to hide, you have nothing to fear” it implies that people who desire privacy are likely involved in wrongdoing, or at least something worth hiding. While people who commit crimes and who are insincere would indeed benefit from greater privacy, there exist many alternative reasons as to why people feel a greater or lesser need for privacy. Among those reasons are dispositional explanations. For example, people who need more privacy may be simply more introverted, hesitant, or prudent.

A better understanding of the relation between personality and privacy is thus useful to illuminate the full range of human motivation for desiring privacy, and thus understanding individual decision-making and behavior surrounding personal privacy. Several theories argue that personality determines privacy behaviors (Masur, 2018, p. 155). However, to date there is almost no empirical research that can be used to develop well-informed hypotheses. As a result, this paper seeks to answer the following question: What personality factors and facets best explain individuals’ felt need for privacy?

## The Need for Privacy

We first outline our own understanding of privacy, because the theoretical concept of privacy is multidisciplinary, complicated, and contested (Nissenbaum, 2010, p. 71). First and foremost, privacy captures a *withdrawal* from other individuals or from society in general (Westin, 1967). This withdrawal happens *voluntarily* and is under a person’s *control* (Westin, 1967). Several models suggest that privacy is multi-dimensional. For example, in a theory-driven treatise Burgoon (1982) argued that privacy has four dimensions: informational, social, psychological, and physical. Pedersen (1979) conducted an empirical factor analysis of overall 94 items and found six dimensions of privacy: reserve, isolation, solitude, intimacy with friends, intimacy with family, and anonymity. Schwartz (1968) and Masur, Teutsch, and Dienlin (2018) differentiated between horizontal and vertical privacy; whereas horizontal privacy captures withdrawal from peers, vertical privacy addresses withdrawal from superiors or institutions (e.g., government agencies or businesses).

In this study, we employ a multifaceted model of need for privacy. We focus on (a) vertical privacy with regard to people’s felt need for withdrawal from government surveillance and private companies; (b) horizontal privacy in terms of the perceived need for psychological and/or physical withdrawal from other people; and (c) general privacy as captured by people’s felt need for informational privacy, anonymity, and privacy in general.

According to Trepte and Masur (2017), the need for privacy is a secondary need—it is not an end in itself, but rather a means to satisfy other more fundamental needs such as safety, sexuality, recovery, or contemplation. Westin (1967) defined four ultimate purposes of personal privacy: (1) self-development (i.e., the integration of experiences into meaningful patterns), (2) autonomy (the desire to avoid being manipulated and dominated), (3) emotional release (the release of tension from social role demands), and (4) protected communication (the ability to foster intimate relationships). Privacy also facilitates self-disclosure (Dienlin, 2014), which is necessary for attaining social support, initiating relationships, and getting close to other people (Omarzu, 2000).

But privacy can also have negative aspects. It is possible to have too much privacy. Humans are inherently social, and being cut-off from others can diminish flourishing, nurture deviant behavior, or introduce power asymmetries (Altman, 1975). The fact that privacy fosters self-disclosure also presents a potential risk, because others might disagree, disapprove, or misuse the information (Petronio, 2010). And privacy can also help conceal wrongdoing or crime. The dialectical tension between the positive and negative aspects of privacy might itself cause variability across individuals in their felt need for privacy both within and across contexts or situations.

## Predicting the Need for Privacy

So far, few studies have analyzed the relation between personality and need for privacy explicitly. We are aware of only two studies that conducted an empirical analysis (Hosman, 1991; Pedersen, 1982, see below), and as there is no established theory connecting privacy and personality, it is difficult to formulate precise and well-informed a priori hypotheses. In terms of potential theoretical explanations as to why personality might relate to the need for privacy, we could imagine that much depends on whether one is orienting around an entity that is considered a threat or a resource. If something is a threat, if it is negative, it seems more likely to withdraw and to desire more privacy; if something is a resource, however, it seems more plausible to open up, to approach, and to desire less privacy (Altman, 1976).

In this study though we nonetheless adopt a more exploratory perspective. We implement a large-scale operationalization of personality in order not to miss potentially relevant personality factors and facets. To this end, we build on the HEXACO inventory of personality (Lee & Ashton, 2018). The HEXACO model stands in the tradition of the Big Five approach (John & Srivastava, 1999). It measures overall six factors (discussed below), which have four specific facets each. We include the specific facets because we do not expect that the need for privacy dimensions will relate closely to the overarching general personality factors. For example, consider that privacy concern, a variable conceptually close to need for privacy, shows only small relations to the Big Five factors (Bansal, Zahedi, & Gefen, 2010; Junglas, Johnson, & Spitzmüller, 2008).

Another reason for choosing the HEXACO model was that in addition to the Big Five factors the HEXACO model includes a sixth factor labeled honesty-humility, plus another additional meta-facet called altruism, which together seem relevant to investigating the nothing-to-hide-argument. In what follows, we briefly present all factors and provide some tentative thoughts on how they and several selected facets might relate to privacy.

### Honesty-Humility & Altriusm.

Honesty-humility consists of the facets sincerity, fairness, greed avoidance, and modesty. The meta-facet altruism measures benevolence toward others and consists of items such as “It wouldn’t bother me to harm someone I didn’t like.” According to the nothing-to-hide argument, it could be assumed that a person feels they need privacy because they have something to hide—they are less honest, sincere, fair, or benevolent. Logically, people who commit crimes likely face even greater risk from self-disclosure compared to others because government agencies and people would sanction them if their activities were revealed (Petronio, 2010). Hence, the government and other people are likely to be perceived as a threat. As a consequence, people with lower honesty and humility might desire more privacy as a means to mitigate their felt risk (Altman, 1976).

Empirical studies have indeed found that surveillance can indeed reduce cheating behaviors (Corcoran & Rotter, 1987; Covey, Saladin, & Killen, 1989). Covey, Saladin, and Killen (1989) asked students to solve an impossible maze. In the high surveillance condition, the experimenter stood in front of the students and closely monitored their behavior. In the low surveillance condition, the experimenter could not see the students. Results showed greater cheating among students in the low surveillance condition, suggesting that in situations with less privacy people are more honest. In a longitudinal sample with 457 respondents in Germany (Trepte, Dienlin, & Reinecke, 2013), people who felt they needed more privacy were also less authentic (and therefore, arguably, also less honest and sincere) on their online social network profiles (*r* = -.48) and less authentic in their personal relationships (*r* = -.28). Together, these studies suggest the possibility that lack of honesty may relate to an increased need for privacy, especially when it comes to government surveillance.

In conclusion, it seems possible that lack of honesty may indeed relate to an increased need for privacy, especially when it comes to government surveillance.

### Emotionality.

It is also possible that need for privacy is related to a person’s level of emotionality. Emotionality is captured by the facets fearfulness, anxiety, dependence, and sentimentality. With regard to interpersonal privacy, people who are anxious may be more likely to consider social interactions as a risk or threat (especially with strangers or weak ties, Granovetter, 1973), which is why anxious people might desire more privacy. Somewhat related, prior empirical research showed that people who are more concerned about their privacy (in other words, more anxious) are more likely to self-withdraw online, for example by deleting posts or untagging themselves from linked content (Dienlin & Metzger, 2016). On the other hand, the opposite may be true: People who are more anxious in general may desire *less* privacy from others (especially their strong ties), as a means to cope better with their daily challenges.

People who are more anxious might also desire less privacy from government surveillance. Despite the fact that only 18% of all Americans trust their government “to do what is right,” almost everyone agrees that “it’s the government’s job to keep the country safe” (Center, 2015, 2017). Hence, for anxious individuals, the government might be seen as a resource rather than a threat. It therefore seems plausible that people who are generally more anxious are also more likely to consent to government surveillance, given that such surveillance potentially prevents crime or reduces the likelihood of violent attacks (e.g., terrorism). Yet, the relation could also be that more anxious people desire more privacy in certain realms. It is plausible that anxiety correlates with being in favor of government surveillance of *others*; however, this does not necessarily extend to someone’s *own* data. If the government is perceived as a threat, as often expressed by members of minority groups, for example, then it follows that someone might desire more personal privacy.

### Extraversion.

Extraversion comprises the facets social self-esteem, social boldness, sociability, and liveliness. Arguably, extraversion is the factor that should correspond most closely to individuals’ need for privacy. This especially pertains to the sociability facet, which captures whether people prefer to spend their time alone or with company. It is plausible that people who are more sociable are also more likely to think of other people as a resource, which is why they should generally desire less interpersonal privacy and less anonymity (e.g., Buss, 2001). Put differently, given that privacy is the voluntary withdrawal from society (Westin, 1967), people who are less sociable, more reserved, or more shy should have a greater need for privacy from others. One could even make the case that need for interpersonal privacy and sociability are conceptually the same, and that need for privacy is just a different label for the same underlying personality trait. That said, we are not aware of a personality inventory that explicitly refers to privacy, and as outlined above, privacy is multidimensional such that different aspects of the need for privacy (i.e., from the government or companies, from other individuals) appear to be different conceptually.

Several empirical studies support the proposed relation between extraversion and need for privacy from others. People who scored higher on the personality meta-factor plasticity, which is a composite of the two personality factors extraversion and openness, desired less privacy (Morton, 2013); people who described themselves as introverted thinkers were more likely to prefer social isolation (Pedersen, 1982); and introverted people were more likely to report invasions of privacy (Stone, 1986). Pedersen (1982) showed that three dimensions of need for privacy relate to general self-esteem (but not social self-esteem): Respondents who held a lower general self-esteem were more reserved (*r* = .29), needed more anonymity (*r* = .21), and preferred solitude (*r* = .24) than people with higher general self-esteem. Finally, (**larsonNeedPrivacyIts1988?**) and Hosman (1991) discuss and suggest that people who are more shy also need more privacy.

### Agreeableness.

Agreeableness is captured by the facets forgiveness, gentleness, flexibility, and patience. It is not entirely clear whether or how agreeableness might relate to the need for privacy. Potentially noteworthy is that people who are more agreeable are also moderately less concerned about their privacy (Junglas, Johnson, & Spitzmüller, 2008). Thus, because need for privacy and privacy concern are closely related, it seems possible that more agreeable people desire less privacy.

### Conscientiousness.

Conscientiousness consists of the facets organization, diligence, perfectionism, and prudence. Arguably, all facets are more or less about being in control, about reducing potential risks, or about avoiding future costs. And because privacy is about control (Westin, 1967), we could imagine that an individual’s felt need for privacy relates to their general tendency to avoid risks, to deliberate, and to plan ahead carefully. Especially if other people are considered a threat, people who are risk averse might desire more interpersonal privacy. If government or private companies are considered a threat, risk averse people have a stronger desire for privacy from such entities. In either case, the most cautious strategy to minimize risks of information disclosure would be to keep as much information as possible private. Empirical studies report that people with a stronger control motive require slightly more seclusion (*r* = .12) and anonymity (*r* = .15) (Hosman, 1991). People who consider their privacy at risk are less likely to disclose information online (e.g., Bol et al., 2018). Moreover, conscientious people are slightly more concerned about their privacy (Junglas, Johnson, & Spitzmüller, 2008). But as discussed above, especially with regard to privacy from government surveillance, risk averse people could also desire *less* privacy, so that the government is able to avert potential threats.

### Openness to experience.

Openness to experiences comprises the facets aesthetic appreciation, inquisitiveness, creativeness, and unconventionality. Openness to experience is also considered a measure of intellect and education. Potentially related to this, empirical studies have showed that more educated people have more knowledge about how to protect their privacy (Park, 2013), which could be the result of an increased need for privacy. Supporting this reasoning, Junglas, Johnson, and Spitzmüller (2008) found that openness to experience is positively related to privacy concern.

On the other hand, openness is by definition the opposite of privacy, and people who are more open to experience new things might not prioritize privacy, because being private is the opposite to being open. Many new digital practices such as online interaction, purchases, or information seeking offer many exciting new benefits, but pose a risk to privacy. People who are more open to new experiences might not care so much about the potential risks to privacy because they want to avail themselves of the potential benefits that new experiences make available. An example might be that people with greater openness to experiences would be more likely to try a new online social network or medium of communication.

### Socio-demographic variables.

Finally, it seems likely that the need for privacy is also related to some sociodemographic variables, such as sex, age, education, and affluence. For example, a study of 3,072 people from Germany found that women desired more informational and physical privacy, while men needed more psychological privacy (Frener, Wagner, & Trepte, 2021). In a nationally representative study of the U.S. and Japan, in both countries people who were older and who had higher income levels reported more privacy concern. As mentioned above, more educated people possess more privacy knowledge (Park, 2013), and as a consequence they might desire more privacy. Ethnicity might also correspond to need for privacy, perhaps because members of non-white groups desire more privacy from the government, but not necessarily from other people. Some minorities groups (e.g., Black or Native Americans) often report lower levels of trust in white government representatives (**kochRacialMinoritiesTrust2019?**), which might increase the desire of privacy from governments. We will additionally investigate whether a person’s romantic relationship status corresponds to their expressed need for privacy. Last, we will examine whether one’s political position is related to the need for privacy. We could imagine that more right-leaning people desire more privacy from the government, but not necessarily from other people. People who are more conservative tend to trust the government slightly less (**cookSkepticalAmericanRevisiting2005?**), which might be associated with an increased need for privacy.

# Method

This section describes how we determine the sample size, data exclusions, the analyses, and all measures in the study.

## Prestudy

We ran a prestudy, which is published as a preprint (Dienlin & Metzger, 2019). This study was submitted initially, but rejected for both empirical and conceptual reasons (for example, insufficient statistical power). This proposal aims to remedy these shortcomings. In the prestudy, we tested several self-developed items, which are reported below.

## Sample

Participants will be collected from the professional online survey panel Prolific. The sample will be representative of the US in terms of age, gender, and ethnicity. The study received IRB approval from the University of Vienna. We calculated that participation will take approximately 15 minutes. We will pay participants $ 2.56 for participation, which equals an hourly wage of $ 10.24.

To determine sample size, we ran a priori power analyses. Note that the final analyses will be conducted using structural equation modeling, for which exact power analyses are difficult to obtain. We hence conducted preliminary power analyses using two-sided bivariate correlations. Hence, the following power analyses are not exact but rather a rough guide to get a better idea of the required minimum sample size.

We based our power analysis on a smallest effect size of interest (SESOI). We only considered effects at least as great as *r* = .10 as sufficiently relevant to constitute support for an effect’s existence (Cohen, 1992). Oftentimes, researchers opt for an alpha error of 5% and a power of 80% (i.e., beta error of 20%). Because we adopted an exploratory perspective, we aimed not to miss potentially existing effects (beta error). We opted for an approach where alpha and beta error are balanced/equal, because we consider both errors to be equally relevant. A power analysis with an alpha and beta error of 5% and an effect size of *r* = .10 required a sample size of *N* = 1293, which was outside of our budget. If we slightly relaxed the error rate to 10%, power analyses showed that we would need a sample size of *N* = 853, which was within our budget, and which is hence be the minimum sample size we plan to collect. Hence, we will use two inference criteria: Effects need to show a p-value below *p* = 10% and an effect size of at least *r* = .10.

We will individually check responses for patterns such as straight-lining or missing of inverted items, making sure to remove only clear cases. We will automatically exclude participants who miss two attention checks. Participants who miss one attention check will be checked individually regarding response patterns. We will remove participants below the minimum participation age of 18 years. We will exclude respondents if they answer fewer than 50% of all questions. The remaining missing responses will be imputed using predictive mean matching. We will remove respondents with unrealistically fast responses, namely below three standard deviations of the median response time.

## Data Analyses and Decision Pipeline

As a “reality check,” we will test items for potential ceiling and floor effects. If means are below 1.5 or above 6.5, these items will be excluded. The factorial validity of the measures and the hypotheses will be tested with structural equation modeling (SEM). If Mardia’s test shows that the assumption of multivariate normality is violated, we will use the more robust Satorra-Bentler scaled and mean-adjusted test statistic (MLM) as estimator. We will test each scale in a confirmatory factor analysis. To avoid overfitting, we will use more liberal fit criteria (CFI > .90, TLI > .90, RMSEA <. .10, SRMR < .10) (Kline, 2016).

If model fit is below the criteria, we will first inspect modification indices, potentially allowing covariance or cross-loadings if theoretically plausible. If these changes do not yield sufficient fit, we will drop malfunctioning items. If fit is still subpar, we will conduct exploratory factor analyses (EFA) to asssess the underlying factor structure. EFAs will be run using maximum likelihood estimation and oblimin rotation (Osborne & Costello, 2004, p. 7). If more than one dimension is revealed, we will implement bifactor model solutions.[[1]](#footnote-32) Bifactor models retain a general measure of the variable, and make it unneccesary to introduce novel (and potentially overfitted) subdimensions. If no adequate bifactor model can be found, we will proceed by deleting items with low loadings on the general factor and/or the specific factors. If also after deletion of individual items no bifactor solution should emerge, we will use a subset of the items to extract a single factor with sufficient factorial validity.

We want to find out *who* needs privacy, and not so much *what causes* the need for privacy. Hence, to answer our research question, we will analyze the variables’ bivariate relations in a joint model combining all variables. First, we will predict need for privacy using the factors, and then using the facets. To get a first idea of the variables’ potential causal relations, we will also run a multiple structural regression model, which we will report on the companion website. Based on reviewer feedback, we will also test which items best predict need for privacy, and report these items on our companion website.

Because both analyses require highly complex model (overall, 24 personality facets, 7 socio-demographic variables, and potentially 8 privacy dimensions), it might be that we need to simply the model. To this end, instead of a fully latent structural regression model we will then conduct a partially latent structural regression model, in which the predictor variables will be modeled as single indicators while controlling for measurement error (Kline, 2016, p. 214). To get high-quality single indicators of the predictors, we will compute the average of the model predicted values/latent factor scores, which can be extracted from the CFAs. If the CFAs show a unidimensional solution, we will use the model predicted values for this latent factor; if the CFAs produce a multidimensional solution, we will use the model predicted values for the general latent factor.

Fully latent SEMs seldom work instantly and often require modifications to achieve satisfactory model fit. Although above we explicated our analysis pipeline, we are aware that this approach still maintains some researcher degrees of freedom. We hence emphasize that we will adapt the models only to achieve satisfactory factorial validity, but not to cherry-pick significant results. We adopt this latent modeling approach nonetheless because we consider it superior to regular analyses such as regression based models of manifest variables (Kline, 2016). Combining several items into a latent factors helps reduce and condense information, while partialing out error and thereby reducing noise. To provide a complete picture, in the online supplementary material (OSM) we will also share the results of the unaltered latent factors and of regular regression.

## Measures

All items were answered on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).[[2]](#footnote-34) A list of all the items that we will use are reported in the online supplementary material. We will later report also the results of the CFAs/EFAs, as well as item statistics and their distribution plots.

### Need for privacy.

Although there exist several operationalizations of need for privacy (Buss, 2001; Frener, Wagner, & Trepte, 2021; Marshall, 1974; Pedersen, 1979), we are not aware of an encompassing up-to-date scale. Hence, we use both existing scales and self-developed items, some of which were tested in our prestudy. Ad-hoc scales were or will be (preliminary) validated using the following procedure: We (a) collected qualitative feedback from three different privacy experts; (b) followed the procedure implemented by Patalay, Hayes, and Wolpert (2018) and tested (and adapted) the items using four established readability indices (i.e., Flesch–Kincaid reading grade, Gunning Fog Index, Coleman Liau Index, and the Dale–Chall Readability Formula); (c) like Frener, Wagner, and Trepte (2021), we will assess convergent validity by collecting single-item measures of privacy concern and privacy behavior, for which we expect to find small to moderate correlations; (d) all items will be analyzed in confirmatory factor analyses as outline above.

Overall, we will collect 32 items measuring need for privacy, with eight subdimensions consisting of four items each. Three subdimensions captured horizontal privacy—namely psychological, social, and physiological privacy. Psychological and physiological privacy were adopted from Frener, Wagner, and Trepte (2021). Because Frener, Wagner, and Trepte (2021) could not successfully operationalize the dimension of social privacy, building on Burgoon (1982) we self-designed a new social privacy dimension, which in the prestudy showed satisfactory fit. Two subdimensions measured vertical privacy. The first subdimension is government surveillance, which represents the extent to which people want the government to abstain from collecting information about them. The second subdimension is need for privacy from companies, which we measured using four self-designed items. Both scales were pretested and showed good factorial validity. Finally, three subdimensions measured general privacy. The first subdimension is informational privacy, with items adopted from Frener, Wagner, and Trepte (2021). The second subdimension is anonymity, which captures the extent to which people feel the need to avoid identification in general. Third, we will also collect a self-developed measure of general need for privacy. Both scales were pretested and showed good factorial validity.

### Personality.

Personality will be measured using the HEXACO personality inventory. The inventory consists of six factors with four dimensions each, including the additional meta scale of “altruism.”

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# Contributions

Conception and design: TD, MM. Data acquisition: TD. Code: TD. Analysis and interpretation of data: TD, MM; First draft: TD; Revisions & Comments: TD & MM.

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# Competing Interests

Both authors declare no competing interests.

# Supplementary Material

All the stimuli, presentation materials, participant data, analysis scripts, and a reproducible version of the manuscript can be found or will be shared as online supplementary material on the open science framework (<https://osf.io/e47yw/>). The paper also has a companion website where all materials can be accessed (<https://tdienlin.github.io/Who_Needs_Privacy_RR/proposal.html>).

# Data Accessibility Statement

The data will be shared on the open science framework (<https://osf.io/e47yw/>) and on github.

1. Bifactor models implement one factor that explains the variance in all items (the so-called general factor or g-factor). In addition, at least two additional factors are implemented that explain the variance in a subset of the items. The general factor and the specific factors are orthogonal. Bifactor models are nested within hierarchical models. For more information on bifactor models, see Kline (2016), p. 319. Note that we will not specify a bifactor model of need for privacy, because we are explicitly interested in the relations between the personality facets and the three dimensions of need for privacy. [↑](#footnote-ref-32)
2. Note that the HEXACO inventory normally uses 5-point scales. Because we were not interested in comparing absolute values across studies, we used 7-point scales to have a uniform answer format for all items, which in addition likely increases meaningful variance. [↑](#footnote-ref-34)