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

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Abstract

Privacy is defined as a voluntary withdrawal from society. Everyone needs privacy. Currently, however, we still know little about who needs more and how needs less privacy. In this study, we hence explore the relations between the need for privacy and personality. Personality will be operationalized using the HEXACO personality inventory. Need for privacy will be measured along the dimensions of (a) social, (b) psychological, and (c) physical privacy; need for privacy from (d) government agencies and (e) companies; as well as (f) informational privacy, (g) need for anonymity, and (h) general privacy. A sample of 1,293 respondents representative of the U.S. in terms of age, gender, and ethnicity will be collected. The correlations between privacy, personality, and sociodemographics will be analyzed using structural equation modeling.

Keywords: Privacy, need for privacy, personality, HEXACO

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

Privacy is a major topic of public discourse and academic interest (Dienlin & Breuer, 2022). Yet despite its importance, to date we still know surprisingly little about the relation between privacy and personality (Masur, 2018, p. 155). What can we infer about a person if they desire more privacy? Are they more introverted, more risk-averse, or more traditional? Asking this question seems relevant, not least because people who desire more privacy are often confronted with suspicions, having to justify why they want to be left alone. Consider the nothing-to-hide argument (Solove, 2007). Accordingly, people who oppose state surveillance only do so because they have something to hide. For if you who have nothing to hide, you would have nothing to fear. Is it true that people who desire more privacy are also more dishonest, greedy, or unfair? Or are people simply less extroverted, more diligent, or more prudent? With this paper, we hence seek to answer the following question: What can we learn about a person's personality if they say they desire more privacy?

Privacy and Personality

Privacy captures a *withdrawal* from others or from society in general (Westin, 1967). This withdrawal happens *voluntarily*, and it is under a person's *control* (Westin, 1967). Privacy is multi-dimensional. On the broadest level, we can differentiate the two dimensions of horizontal and vertical privacy Masur, Teutsch, & Dienlin (2018). Whereas horizontal privacy captures withdrawal from other people or peers, vertical privacy addresses withdrawal from superiors or institutions (e.g., government agencies or businesses). In her theoretical analysis, Burgoon (1982) argued that privacy has four more specific dimensions: informational, social, psychological, and physical privacy. Pedersen (1979) conducted an empirical factor analysis of 94 privacy-related items, finding six dimensions of privacy: reserve, isolation, solitude, intimacy with friends, intimacy with family, and anonymity. Building on this work, in this study we employ a multifaceted

model of need for privacy. We focus on vertical privacy with regard to people's felt need for withdrawal from (a) government surveillance and (b) private companies; horizontal privacy in terms of the perceived need for (c) psychological, (d) social and/or (e) physical withdrawal from other people; and general privacy as captured by people's felt need for (f) informational privacy, (g) anonymity, and (h) privacy in general.

We understand and measure personality using the HEXACO inventory of personality (Lee & Ashton, 2018). The HEXACO is a large and comprehensive operationalization of personality. Using the HEXACO will make it less likely to miss potentially relevant factors and facets. The HEXACO model stands in the tradition of the Big Five approach (John & Srivastava, 1999). It includes overall six factors (discussed below), which have four specific facets each. In predicting the dimensions of need for privacy, we will use the facets, because it is unlikely that the very specific need for privacy dimensions will relate closely to the more general personality factors (Bansal, Zahedi, & Gefen, 2010; Junglas, Johnson, & Spitzmüller, 2008). In addition to the Big Five, the HEXACO model includes a sixth factor labeled honesty-humility (plus a meta-facet called altruism), which together seem well-suited to investigate the nothing-to-hide-argument.

Predicting the Need for Privacy

So far, only few studies have analyzed the relation between personality and need for privacy empirically (Hosman, 1991; Pedersen, 1982, see below). In addition, we are not aware of a viable theory specifically connecting privacy and personality. Due to the dearth of empirical studies and the lack of viable specific theories, in this study we hence adopt an exploratory perspective.

In order to understand how personality might relate to privacy, we can ask ourselves the following question. Why do people desire privacy? Privacy is important. But according to Trepte and Masur (2017), the need for privacy is only a secondary need—not an end in itself. Accordingly, privacy satisfies other more fundamental needs such as safety, sexuality,

recovery, or contemplation. Westin (1967) similarly defined four ultimate purposes of 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 facilitates self-disclosure (Dienlin, 2014). It is hence important for social support, relationships, and intimacy (Omarzu, 2000). But privacy can also have negative aspects. It is possible to have too much privacy. Being cut-off from others can diminish flourishing, nurture deviant behavior, or introduce power asymmetries (Altman, 1975). And privacy can also help conceal wrongdoing or crime. As a general guiding principle based on an evolutionary perspective, we could imagine that if other people, the government, or companies are considered a threat, people are more likely to withdraw and to desire more privacy. Conversely, if something is considered a resource, people might open up, approach others, and desire less privacy (Altman, 1976). In what follows, we briefly present all factors and how they might relate to need for 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, a person desiring more privacy might be less honest, sincere, fair, or benevolent. People who commit crimes likely face greater risk from self-disclosure, because government agencies and people would enforce sanctions if their activities were revealed (Petronio, 2010). Hence, in those cases the government and other people are likely 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 privacy can increase cheating behaviors (Corcoran & Rotter, 1987; Covey, Saladin, & Killen, 1989). Covey et al. (1989) asked students to solve an impossible maze. In the surveillance condition, the experimenter stood

in front of the students and closely monitored their behavior. In the privacy condition, the experimenter could not see the students. Results showed greater cheating among students in the low surveillance condition, suggesting that in situations with more privacy people are less 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). People who needed more privacy were also less authentic in their personal relationships (r = -.28).

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

Emotionality. Emotionality is captured by the facets fearfulness, anxiety, dependence, and sentimentality. People who are anxious may be more likely to consider social interactions a risk or threat (especially with strangers or weak ties, Granovetter, 1973). Anxious people might hence desire more privacy. 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 also 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" (Pew Research Center, 2015, 2017). More anxious people might hence consider the government a resource rather than a threat. They might more likely consent to government surveillance, given that such surveillance could prevent crime or terrorism. On the other hand, it could also be that more anxious people desire more privacy from government agencies. Although they even might be in favor of government surveillance of *others*, this

does not necessarily include *themselves.* Especially if the government is perceived as a threat, as often expressed by members of minority groups, then one might actually desire more personal privacy.

Extraversion. Comprising the facets social self-esteem, social boldness, sociability, and liveliness, extraversion is arguably the factor that should correspond most closely to need for privacy. Conceptually, interpersonal privacy and sociability are closely related. More sociable people are likely more inclined to think of other people as a resource, which is why they should desire less interpersonal privacy and less anonymity (e.g., Buss, 2001). Given that privacy is a 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.

This hypothesis is supported by several empirical studies. 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). Introverted people were more likely to feel their privacy was invaded (Stone, 1986). Pedersen (1982) reported that the three dimensions of need for privacy related to general self-esteem (but not social self-esteem). Respondents who held a lower general self-esteem were more reserved ($r = .29$), and needed more anonymity ($r = .21$) and solitude ($r = .24$). Finally, Larson and Bell (1988) and Hosman (1991) suggested that people who are more shy also need more privacy.

As a result, we hypothesize that people who are more extroverted also need less social privacy and less privacy in general. Regarding the other dimensions of privacy, such as privacy from governments or from companies, we do not pose specific hypotheses.

Agreeableness. Agreeableness has the four facets of forgiveness, gentleness, flexibility, and patience. It is not entirely clear whether or how agreeableness might relate to the need for privacy. People who are more agreeable are also moderately less concerned about their privacy (Junglas et al., 2008). Thus, because need for privacy and privacy

concern are closely related, more agreeable people might desire less privacy.

Conscientiousness. Conscientiousness consists of the facets organization, diligence, perfectionism, and prudence. Arguably, all facets are about being in control, about reducing relevant risks and future costs. Because control is a central part of privacy (Westin, 1967), people who avoid risks, who deliberate, and who plan ahead carefully, might prefer to have more privacy. Especially if others are considered a threat, being risk averse might increase the desire for more interpersonal privacy. Similarly, if government agencies or private companies are considered a threat, risk averse people might have a stronger desire for privacy. 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 reported that people with a stronger control motive required slightly more seclusion ($r = .12$) and anonymity ($r = .15$) (Hosman, 1991). People who considered their privacy at risk were less likely to disclose information online (e.g., Bol et al., 2018). Moreover, conscientious people were slightly more concerned about their privacy (Junglas et al., 2008).

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. In one study it was found 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. In another study, openness to experience is positively related to privacy concern (Junglas et al., 2008)

On the other hand, openness is conceptually the opposite of privacy. People more open to new experiences might not prioritize privacy. Many new digital practices such as social media, online shopping, or online dating offer exciting new benefits, but pose a risk to privacy. People who are more open to new experiences might focus on the benefits and not on the potential risks. Hence, different relations between need for privacy and openness seem possible.

Socio-demographic variables. The need for privacy should also be related to sociodemographic aspects, such as sex, age, education, and income. For example, a study of 3,072 people from Germany found that women desired more informational and physical privacy than men, whereas men desired more psychological privacy (Frener, Wagner, & Trepte, 2021). In a nationally representative study of the U.S. and Japan, people who were older and who had higher income levels reported more privacy concern. More educated people possess more privacy knowledge (Park, 2013), and as a consequence they might desire more privacy. Ethnicity might also correspond to the need for privacy, perhaps because members of minority 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 (Koch, 2019), which might increase the desire of privacy from government agencies. We will also explore 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 (Cook & Gronke, 2005), 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

This study builds on a prior project in which we analyzed the same research question (Dienlin & Metzger, 2019). This study was already submitted to Collabra, but rejected. The main reasons were that the sample was too small, that not one coherent personality inventory was used, that most privacy measures were designed ad-hoc, and that the

inferences were too ambitious. We hence decided to treat our prior project as a pilot study and to address the criticism by conducting a new study. In this new study, we redevelop our study design, we collect a larger sample, implement the HEXACO inventory together with other more established need for privacy measures, and overall adopt a more exploratory perspective. Being our central construct of interest, we also develop a small number of new items to have a more comprehensive measure of need for privacy.

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 (#20210805_067). 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 (SEM), for which exact power analyses are difficult to obtain. We therefore 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 support an effect's existence (Cohen, 1992). Adopting an exploratory perspective, not wanting to miss actually existing effects, we considered both alpha and beta errors to be equally relevant. We hence opted for balanced alpha and beta errors of 5%. A power analysis with an alpha and beta error of 5% and an effect size of $r = .10$ revealed that we required a sample size of $N = 1293$. We obtained sufficient funding to collect a sample of this size. Hence, we will use two inference criteria: Effects need to show a p-value of below $p = 5\%$ and an effect size of at least $r = .10$.

Planned Analyses

We will individually check answers for response patterns such as straight-lining or missing of inverted items. We will conservatively remove participants with clear response patterns. We will automatically exclude participants who miss the two attention checks we will implement. 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 remove respondents with unrealistically fast responses (three standard deviations below the median response time).

Missing responses will be imputed using multiple imputation with predictive mean matching (five datasets, five iterations, using all variables). The analyses will be run with all five datasets, and the pooled results will be reported.

The factorial validity of the measures and the hypotheses will be tested using structural equation modeling. 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 assess model fit, we will use more liberal fit criteria to avoid overfitting (CFI $>$ .90, TLI $>$ .90, RMSEA $<$. .10, SRMR $<$ .10) (Kline, 2016). In cases of misfit, we will conservatively alter models using an a priori defined analysis pipeline (see online supplementary material). 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.

We want to find out *who* needs privacy, and not so much *what causes* the need for privacy. Hence, to answer our research question, in a joint model combining all variables (including sociodemographic variables) we will analyze the variables' bivariate relations. To predict the need for privacy, we will first use the six personality factors. Afterward, we will predict privacy using the more specific facets. To get a first idea of the variables' potential causal relations, we will also run a multiple structural regression model.

Fully latent SEMs seldom work instantly, often requiring modifications to achieve

satisfactory model fit. Although we explicate our analysis pipeline, there still remain several researcher degrees of freedom. We still decided to use fully latent SEMs, because we consider it superior to regular analyses such as correlation or regression using manifest variables (Kline, 2016). Combining several items into a latent factors helps reduce error and condense information, thereby reducing noise. Together, this should provide a better measure of the latent variables, which will also reduce the beta error. To provide context, in the online supplementary material (OSM) we will also share the results of alternative analyses, such as correlations of average scores.

We anticipate to finish the project three months after our registration was accepted.

Measures

All items will be answered on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).[1] 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 et al., 2021; Marshall, 1974; Pedersen, 1979), we are not aware of one encompassing, comprehensive, and up-to-date scale. Hence, we use both existing scales and self-developed items, some of which were tested in our pilot study. Ad-hoc scales were or will be (preliminary) validated using the following procedure: We (a) collected qualitative feedback from three different privacy experts;[2] (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

[1] 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 across all items.

[2] The three experts who provided feedback were Moritz Büchi (University of Zurich), Regine Frener (University of Hohenheim), and Philipp Masur (VU Amsterdam).

Index, Coleman Liau Index, and the Dale–Chall Readability Formula); (c) like Frener et al. (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 outlined above.

Overall, we will collect 32 items measuring need for privacy, with eight subdimensions that all consist of four items each. Three subdimensions capture horizontal privacy—namely psychological, social, and physical privacy. Psychological and physical privacy were adopted from Frener et al. (2021). Because Frener et al. (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 measure 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 scale was pretested and showed good factorial validity. The second subdimension is need for privacy from companies, which we will measure using four new self-designed items. Finally, three subdimensions capture general privacy. The first subdimension is informational privacy, with items adopted from Frener et al. (2021). The second subdimension is anonymity, which captures the extent to which people feel the need to avoid identification in general. The scale was pretested and showed good factorial validity; one new item was designed for this study. Third, we will also collect a new self-developed measure of general need for privacy.

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".

Results

To visualize how results might look like, we have simulated some random data. Please note that these results are completely random and do not make sense from a

Table 1

Predicting the need for privacy dimensions using sociodemographic variables.

	Need for privacy							
Sociodemographics	Social	Phys.	Psych.	Comp.	Gov.	Anonym.	Inform.	General
Age	-0.05	0.16	0.00	0.02	-0.29	0.41	-0.14	0.31
Gender	0.20	0.00	-0.03	-0.03	-0.12	-0.06	0.04	-0.51
Ethnicity	0.19	0.05	-0.01	-0.01	0.05	-0.07	0.01	-0.47
Relationship	0.09	-0.04	-0.01	0.00	-0.19	-0.07	-0.11	-0.19
College	-0.10	0.07	-0.03	-0.03	-0.07	0.10	0.07	-0.42
Income	-0.10	-0.07	0.04	-0.01	0.12	-0.13	-0.08	-0.22
Conservatism	-0.26	0.06	0.12	0.01	-0.05	0.30	-0.03	0.48

theoretical perspective. When calculating the multiple regressions, the models did not converge, which is why several estimates could not be computed (see below).

In Table 1, we report how sociodemographics predict need for privacy.

In Table 2, we report how personality factors predict need for privacy.

In Table 3, we report how personality facets predict need for privacy.

Table 2

Predicting the need for privacy dimensions using personality factors.

	Need for privacy							
Personality factors	Social	Phys.	Psych.	Comp.	Gov.	Anonym.	Inform.	General
Honesty humility	-0.31	0.01	-0.01	0.24	0.26	-0.84	-0.03	-0.29
Emotionality	0.94	-0.02	0.07	-0.47	-0.05	1.26	0.05	0.20
Extraversion	-0.99	-0.03	0.07	0.77	1.76	-0.09	0.71	-2.69
Agreeableness	-0.63	0.04	-0.11	-0.51	0.83	0.95	0.08	2.08
Conscientiousness	0.25	-0.01	0.02	0.01	-0.82	-0.05	0.15	-0.13
Openness	0.07	0.01	-0.07	-0.56	0.09	0.99	0.11	-0.21

In Figure 1, you can find how each personality factor—while holding constant for all other personality factors and sociodemographics—predicts need for privacy.

Table 3

Predicting the need for privacy dimensions using personality facets.

	Need for privacy							
Personality facets	Social	Phys.	Psych.	Comp.	Gov.	Anonym.	Inform.	General
Honesty humility								
Sincerity	-0.63	0.01	-0.87	0.38	-0.51	0.22	-0.04	0.44
Fairness	0.05	0.01	0.02	-0.31	0.50	1.61	0.16	-1.67
Greed avoidance	0.17	-0.06	-3.01	-0.47	-1.51	1.03	2.07	10.89
Modesty	0.43	-0.01	-1.11	-0.61	0.57	1.92	0.17	2.29
Emotionality								
Fearfulness	0.68	0.00	0.62	0.60	0.62	1.46	0.58	1.23
Anxiety	-0.64	0.03	-0.20	-0.05	0.42	-0.83	-0.05	-0.32
Dependence	-0.39	0.00	0.23	-0.15	-0.02	-0.31	0.26	1.12
Sentimentality	-0.88	0.02	-0.70	0.44	0.23	-0.08	0.30	1.66
Extraversion								
Social Self-Esteem	-0.44	0.02	0.16	0.28	-0.32	0.85	-0.49	-2.70
Social Boldness	-0.91	-0.03	-0.21	-0.25	0.51	3.05	0.36	-0.07
Sociability	-0.49	-0.01	0.32	0.36	0.11	2.36	0.02	-0.07
Liveliness	2.00	0.00	-2.64	-2.49	-1.39	9.42	-4.20	-6.43
Agreableness								
Forgiveness	-0.45	0.03	0.26	-0.50	-0.17	0.80	-0.23	-0.51
Gentleness	0.01	0.00	0.00	0.00	0.00	0.04	0.00	-0.03
Flexibility	-0.25	0.01	0.26	-0.30	0.54	0.08	0.38	1.40
Patience	0.33	-0.02	0.11	-0.34	-0.63	-3.00	0.16	-0.56
Conscientiousness								
Organization	-2.04	0.02	0.61	-0.51	2.55	1.02	1.42	3.58
Diligence	-0.27	-0.01	0.08	-0.20	-0.07	1.10	0.28	0.79
Perfectionism	-0.41	0.03	0.69	-1.26	0.53	0.89	-0.39	1.79
Prudence	0.54	-0.02	-0.50	-0.04	-1.17	-3.02	-0.69	1.36
Openness to experiences								
Aesthetic Appreciation	-0.30	0.00	-0.94	-0.07	-0.44	-2.01	-0.35	0.15
Inquisitiveness	-1.49	-0.03	-0.14	0.31	0.12	-0.56	-0.67	1.12
Creativeness	0.19	0.00	0.01	-0.65	-0.11	2.46	0.07	-0.12
Unconventionality	-0.82	-0.02	0.54	-0.08	0.12	1.52	0.05	0.97
Altruism	0.56	0.00	-0.28	0.18	-0.33	-0.36	0.36	0.70

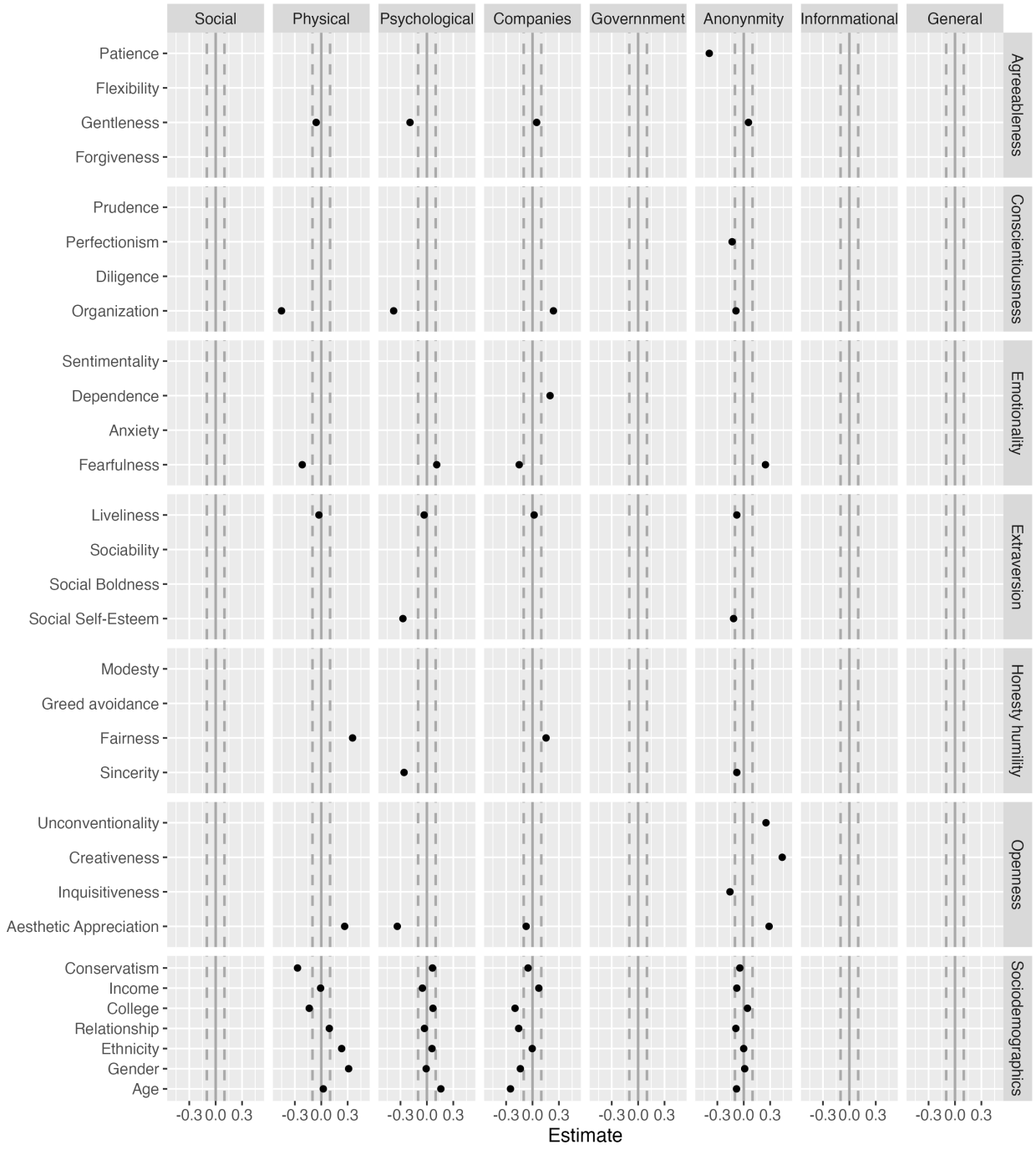

Figure 1. Results of multiple regressions, in which we predict all dimensions of need for privacy using all personality dimensions and sociodemgraphic factors simultaneously.

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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.