

Understanding People's Decisions to Tell Privacy-Protecting Lies in Multiple Online Contexts

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ABSTRACT

In this paper we study online “privacy lies”, lies primarily aimed at protecting privacy. Going beyond privacy lenses that focus on privacy concerns or cost/benefit analyses, we explore how contextual factors, motivations, and individual-level characteristics affect lying behavior through a 356-person survey. We find that statistical models to predict privacy lies that include attitudes about lying and about control over information improve on models based solely on self-expressed privacy concerns. A thematic analysis of responses from non-liars reveals multiple reasons to not tell privacy lies, while a thematic analysis of privacy lies shows that people weighed the nature of the request and the requestor, and expressed a wide variety of goals and concerns that additionally varied by interaction context. Together, our results point to the need for conceptualizations of privacy lies—and privacy-protective behaviors (PPBs) more broadly—that account for multiple goals, control, context, and attitudes about PPBs.

Author Keywords

Privacy; privacy-protective behaviors; deception.

ACM Classification Keywords

K.4.1. Computers and Society: Public Policy Issues: Privacy.

INTRODUCTION

The proliferation of digital technologies has brought about an unprecedented amount of data collection and data sharing in people's everyday lives. People's concerns about sharing their personal information online have grown alongside these technological developments: in 2016, 74% of Americans believed that it is “very important” to be in control of personal information online, though only 9% of those surveyed believed they have such control [68]. In the absence of such control, people engage in a variety of privacy-protective behaviors (PPBs), from choosing to withhold personal information to complaining to regulators [75].

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A less-studied PPB is to provide false information when faced with a concerning request: that is, to lie. This paper focuses on these “privacy lies” that are motivated by privacy and safety concerns [15; 36]. Such lies are fairly common: almost half of American teenagers have entered false information on their online profiles [47], and 40% of a sample of Internet users report lying to commercial websites [31].

Despite its prevalence, there is only limited understanding of this practice, including what motivates people to do it, how they engage in it, and to what effect. In particular, we see a need to look beyond common lenses such as privacy concerns as an antecedent to this behavior, as the well-known privacy paradox shows us that privacy concerns are often a poor indicator of people's actual behavior [7; 26; 61].

However, this doesn't necessarily mean that people don't care about privacy. In fact, privacy goals, concerns, and behaviors are dynamic and influenced by context [60; 64]. Situation-specific factors (such as an individual's current affect) can mediate the effect of pre-existing dispositional factors (such as general privacy concerns) on disclosure [38; 40], while making particular privacy-related needs and goals [1; 84] more or less salient. Finally, privacy lies are, after all, lies, and the literature on deception suggests that attitudes about lying are varied and are likely to be important in understanding privacy lie decisions [56].

To get a better sense of how contexts, goals, and attitudes affect decisions to tell privacy lies, we examine data from a survey of 356 participants, asking about their privacy-related concerns, attitudes, and behaviors, and encouraging them to share interactions in which they told privacy lies. Following other privacy research that addresses either interpersonal or commercial contexts, we prompted people to share with us both (a) “person lies”, when individuals interact directly with humans using computer-mediated communication (for example, text messages, online chat rooms, gaming chats, and dating sites) and b) “system lies”, when individuals interact with technologies themselves (for example, web forms, mobile applications, games, virtual agents, and chatbots), without an immediately salient human recipient. Participants who had not told privacy lies were asked for their reasons for not engaging in this PPB.

We found that attitudes about the morality, prevalence, and effectiveness of lying, as well as perceptions of informational control and the use of other PPBs, were

significant predictors of lying frequency; in contrast, self-reported privacy concerns were insignificant when controlling for these other variables. Still, the model explained only 35% of the variance; analyzing people's lying vignettes revealed that their decisions varied based on their privacy goals, the nature of the request and the requestor, and whether they were interacting with a person or a system. Non-liars' reasons were more categorical: they either saw no need to lie, or saw privacy lies as morally or practically bad. Our findings suggest the need for models to incorporate context-specific factors that indirectly measure privacy concerns, as well as the need to understand how PPBs can have multiple underlying motivations and serve a range of functions besides just protecting personal data.

RELATED WORK

Below we lay the groundwork for these claims, starting with an overview of research on PPBs, focusing on privacy lies. We then go on to discuss individual characteristics beyond privacy concerns that might affect decisions about privacy lies. We then outline work at the intersection of privacy and motivations, and how these may vary by context.

An Overview of Online PPBs, Particularly Privacy Lies

Studies of online PPBs typically focus on one of two broad contexts: commercial interactions with systems or websites, and interpersonal interactions in social media. A taxonomy of PPBs in commercial settings suggests people can respond to privacy concerns in three main ways: a) misrepresenting, obfuscating, or withholding information; b) taking private action against the site by removing their data or negative word-of-mouth; or c) taking public action by complaining to the company or third-party regulators [75]. A range of PPBs is also available in interpersonal interactions in social media, including using ambiguous language [17], lying to interaction partners [85], changing privacy settings to manage audiences [6], and deleting content entirely [17].

As with PPBs in general, privacy lies are generally examined with respect to either commercial or interpersonal situations. Research on lying in commercial contexts indicates that as privacy concerns increase, people are more likely to lie [72], and they weigh costs and benefits when deciding whether to truthfully disclose personal information [33]. Based on interviews, Poddar et al. [67] identified three additional factors that influence consumers' decision to falsify personal information in commercial Internet transactions: the necessity, invasiveness, and fairness of the request.

Privacy lying research also spans a number of interpersonal contexts, from dyadic exchanges with a chat partner (e.g., [86]) to broadcasting false information on social networking sites [27; 46]. As in commercial contexts, the likelihood of lying rises along with the level of privacy concerns [89]. Individual characteristics like gender can influence these decisions; women are less likely to engage in PPBs despite having higher privacy concerns than men [71]. Gender can also be associated with specific concerns; for example,

women engage in deception in online chatrooms mainly for safety reasons [86].

Individual factors beyond privacy concerns

While privacy concerns can predict participants' likelihood to falsify information [72; 89], use privacy-enhancing tools, or withhold information [51], the relationship between privacy concerns and PPB can be relatively weak [58]. More importantly, privacy concerns do not explain the whole story behind people's decision to tell privacy lies. Predictive models have not yet identified the sources of a large part of the variance for telling privacy lies. For instance, Jiang, Heng, and Choi developed a model to predict misrepresentation where privacy concerns and social rewards had limited predictive power ($R^2=.10$) [36], which suggests a need to explore other factors that affect privacy lies in interpersonal contexts. Son and Kim [75] also tried to predict misrepresentation using privacy concerns in a commercial context; they found a non-significant relationship, and suggested that factors other than privacy concerns must underlie misrepresentation in commercial settings. Below, we discuss potential factors that prior research has identified as both promising and potentially measurable for predicting privacy lying.

Informational control. A key dimension of privacy is the desire for informational control [25]. In 2015, 90% of American adults stated that it was important for them to be able to control what personal information was collected about them, and 93% said it was important to control who had access to this information [52]. Having the ability to use privacy-enhancing technologies that allow people to control the flow of their information is positively associated with perceived control of data, which in turn mitigates privacy concerns [87]. This, however, can then lead to more self-disclosure [7] and risky behaviors [69].

General trust and willingness to disclose information. General trust of the Internet reflects a belief that institutional actors will protect and not disclose consumer data [78]. Similarly, an individual's general tendency to disclose personal information can predict PPBs [28] and helps understand disclosure decisions [49], including truthfulness.

Privacy literacy and experiences. Privacy knowledge and experience might also be useful for predicting privacy lies. Privacy literacy scales that rely on the number of actual PPBs people report performing in daily life, such as Turow and Hennessy's [78], serve both as proxies for knowledge and evidence of ability. Further, people's past experiences with privacy violations may impact their privacy concerns [20] and predict PPBs [12]. For example, Facebook users who have personally experienced an invasion of privacy are more likely to engage in PPBs by changing their privacy settings [22]. This suggests the importance of examining privacy-related experiences such as hearing privacy-related news or being a victim of a privacy violation [73].

Attitudes about deception and lying online. Because privacy lies are, well, lies, decisions about them are likely influenced by people's general attitudes about lying, its effectiveness, and its appropriateness for protecting privacy. Some people may see misrepresentation for the sake of privacy as deceitful and be less likely to engage in it [13]. Similarly, protection motivation theory [53] suggests people are more likely to engage in protective behaviors they view as being effective, and perceptions of social norms can influence the frequency of any given behavior [5], including self-disclosure [16].

Taken together, this work suggests a number of individual characteristics beyond privacy concerns that are likely to affect decisions around privacy lies. Our first research question, then, is about whether these factors improve our ability to predict privacy lying behavior:

RQ1: To what extent can individual-level characteristics beyond privacy concerns, including privacy-related views, actual privacy-related experiences, and attitudes about lying as a PPB, help predict privacy lies?

Privacy Goals and Functions, in Context

Most research on PPBs has studied privacy-protective behaviors through the lens of the privacy calculus, based on a weighing of the costs and benefits [23; 40]. For example, people weigh the perceived enjoyment they could derive from revealing information against the likelihood of a privacy violation when making disclosure decisions [43].

However, the considerations and weightings individuals bring to the privacy calculus are only partially determined by persistent, underlying traits such as general privacy attitudes [62]. The "privacy in context" perspective argues that privacy decisions and PPBs reflect contextual interpretations and perceptions that interact with traits such as general privacy attitudes [60; 64; 65].

Furthermore, in order to understand the nature of privacy lies, we have to look into motivations that drive them in a more nuanced way than simply the general goal of protecting privacy or data. According to Westin's taxonomy of privacy functions [84], there are at least four main privacy-related motivations: autonomy, the absence of manipulation by others; self-evaluation, a safe space to reflect on feelings and identity free from the threat of social judgment; emotional relief, the ability to deviate from social norms and expectations; and limited and protected communication, the ability to dictate intimacy and boundaries with interaction partners [84]. These different conceptualizations and functions of privacy are lost if online PPBs are considered through the lens of protecting informational privacy alone.

As with perceived costs and benefits, motivations also likely vary by context. Recent work on context and motivations in disclosure research suggests that contextual factors such as audience representations in social media platforms amplify different types of disclosure motivations, which, in turn, help explain online disclosure decisions [4; 18]. Although this

line of research has focused on disclosure attributes other than truthfulness, we see its insights as likely to apply to decisions around privacy lies as well.

Further complicating matters, relative to the common decision in privacy work to focus on *either* systems or people, is that many online contexts raise interpersonal and system-oriented considerations simultaneously. Decisions to provide truthful information in a Facebook profile, for instance, affect both what Facebook knows about you and how others perceive you. This doesn't mean that both are always salient: for example, Young et al. [90] found that on balance, college students were concerned about protecting their social privacy on Facebook but not their institutional privacy, i.e., collection from companies. Further, specific design decisions in a system's interface can have major impacts in how people perceive context. For instance, design features such as perceived anonymity and availability of social cues can affect people's risk/benefit calculus, and consequently, their privacy concerns [36].

In addition to the macro context, research suggests that the particular interaction partner matters [62]. In general people are more likely to provide information to partners they trust [38] and are familiar with [90]. Characteristics of the requestor also matter in commercial contexts, where decisions to disclose information to websites are based on factors such as regard for the company and trust in the website [57].

The nature of the specific request is also important. People are more likely to disclose information to websites when they see the information request as being relevant to the situation [91], and fair or not invasive [67]. Similarly, people draw on a range of privacy rules when making decisions about disclosure in interpersonal settings where the nature of the request or an initiating message, including the type of question asked, its depth, and its appropriateness, matter for how people respond in an interpersonal exchange [65].

Overall, this literature positions context itself as a malleable rather than a fixed property, to which different people may assign different meanings and amplify certain goals, concerns, and elements while disregarding others. This complicates the relationship between motivations, disclosure truthfulness, and context, and it is important to look at how motivations manifest in multiple contexts, and to what extent common motivations underlying privacy lies might be context-dependent. Together, these findings give rise to the following two research questions:

RQ2: What are people's motivations for telling privacy lies to people and systems? In what situations do they arise and what specific privacy functions do they serve?

RQ3: How do contextual factors, such as people's perception of both information requesters and requests, influence people's decisions to tell privacy lies?

How Can Non-Liars Teach Us About Privacy Lies?

The prior research questions focused on decisions about lying and how context may affect these decisions, but some number of people simply do not or will not tell privacy lies, and we believe studying these *non-users* [3] of privacy lies as a PPB could also be revealing. Based on prior work, we foresee two individual-level characteristics that may drive people to not tell privacy lies. First, existing work on privacy indexes (see [44] for review) suggests that some people may simply be less worried about online privacy and thus not engage in PPBs, including privacy lies. Second, people may have moral reasons for not engaging in PPBs. Some users who tested a differential privacy solution felt that obscuring or fuzzing their information was unethical [13], and moral beliefs are inversely related to misrepresenting oneself in interpersonal contexts [36]. However, privacy lies may not be viewed as immoral, since identity concealment online is viewed as a relatively acceptable form of deception [80]. These observations led to our final research question:

RQ4: What are the reasons people do not tell privacy lies? Are non-liars unconcerned about privacy, or are there other factors that drive their decision to not tell privacy lies?

METHOD

We conducted two main analyses to address our research questions. First, we developed a predictive model based on quantitative survey data to see how individual characteristics influence privacy lie behavior (*RQ1*). Second, we coded and performed a thematic analysis of the examples of privacy lies to understand the motivations underlying the decision to engage in this type of PPB as well as the contexts in which it occurs (*RQ2* and *RQ3*). We then coded and analyzed the reasons people gave for not telling privacy lies (*RQ4*).

Procedure

We collected the data through a survey of Amazon Mechanical Turk (mTurk) workers that invited them to participate in a study on online behaviors and attitudes. After giving consent, participants were first asked for demographic information in case later exposure to information on privacy lies would influence them to lie about such data. Participants were then asked about their general willingness to disclose various data online, and their privacy-related experiences and behaviors. We then presented participants with a short tutorial on privacy lies, adapted from another study on deception [29], to both walk participants through the definition and examples of “privacy lies” and to remove the stigma of admitting to socially unacceptable behavior. To progress to the remainder of the survey, participants had to “pass” the tutorial by answering a 2-item quiz to distinguish privacy lies from other forms of deception to ensure that they understood the definition; they received feedback on incorrect answers, which they could then correct. We informed participants that the survey would include questions about both why they do or do not tell privacy lies, to avoid the impression that one option would be penalized or lead to a shorter survey.

Once the quiz was completed, participants were asked whether they had ever told a privacy lie online, and if so, whether they had told these lies to people in online interpersonal contexts or directly to websites or other devices where another human was not directly involved. These participants were then asked to recall and describe a detailed example of when they had told a privacy lie to a person and/or a system, as applicable, and their reasons for telling the lie. Participants who reported not having told privacy lies were also asked to explain their reasoning in an open-ended response. Finally, all participants answered questions about their privacy concerns and attitudes, as well as their perceptions of the efficacy, commonness, and ethics of privacy lies in general based on hypothetical scenarios describing privacy lies to people and systems.

First, we piloted the survey with a student sample ($n=10$) to test and refine questions. After refinement, the final survey was posted on mTurk at various times during the morning, afternoon and night on multiple days to gain variation in the sample. Since the survey took mTurk participants an average of 12 minutes to complete during a second pilot test ($n=20$), we compensated them \$1.50 to comply with U.S. federal minimum wage standards.

Participants

Of 409 survey respondents, we removed 34 participants who failed the attention check at the end of the survey and 19 participants whose responses did not fit the definition of privacy lies. Of the remaining 356 participants, 54% were male and 82% identified as Caucasian. The average age was 34 years. On average, participants estimated that they used the Internet for 7.6 hours a day. The majority of participants reported having some college education or higher (87%) and being employed full-time (68%). Most participants had worked on mTurk for over 1 year (66%). Only 23% of participants reported never having told a privacy lie, and 18% told them rarely, whereas 41% told them sometimes, and 18% told them often or all the time.

Measures

Frequency of Privacy Lies

Frequency of telling privacy lies was computed from two items: first, participants were asked if they ever told privacy lies (yes/no); participants who selected “yes” were asked to rate the frequency with which they tell privacy lies. These two items were used to compute a 5-point scale (never, rarely, sometimes, often, all the time).

Privacy-Related Views

To measure privacy-related views, we used several scales: a 2-item *Trust of the Internet* scale, $\alpha=.77$ [78]; a 5-item *Perceived Control of Data* scale, $\alpha=.86$ [87]; and a 10-item *Users' Information Privacy Concerns* scale, $\alpha=.79$ (adapted from [55]). Finally, participants were asked about their *Willingness to Disclose Online* for each of 9 personal data points (name, age, gender, sexual orientation, birth date, email address, location, browsing history, and content of online messages), adapting this measure from previous

	Variables	Individual	Reduced Model		Full Model	
		Adj. R ²	Coeff.	S.E.	Coeff.	S.E.
Control variables	Age	.002	-.002	.005	-.002	.005
	Gender (Female as reference category)	<.001	.063	.097	.042	.098
Privacy-related views	Trust of the Internet	.036**	-	-	-.049	.036
	Perceived Control of Data	.040**	-.162*	.061	-.12	.067
	Users' Informational Privacy Concerns	.142**	-	-	.004	.053
	Willingness to Disclose Online	.075**	-.219*	.069	-.188*	.070
Actual privacy-related experiences and behaviors	Number of PPBs	.096**	.139**	.035	.126**	.037
	Freq. of being a Privacy Victim	.003	-	-	.043	.042
	Freq. of Privacy-related News	.049**	-	-	.019	.044
	Freq. of Privacy-concerning Situations	.039**	-	-	.031	.049
Attitudes	Attitudes about Privacy Lies	.275**	.463**	.046	.460**	.053

Table 1. Values for the full model ($R^2 = .37$; adjusted $R^2 = .35$), the reduced model ($R^2 = .36$; adjusted $R^2 = .35$), and individual predictors (controlling for age and gender) predicting frequency of telling privacy lies (n=356).

*Significance is indicated by * for $p < .05$, and ** for $p < .001$.

privacy studies [28;66]. For this measure, we computed a score for each participant by adding the total number of data points they were willing to disclose.

Actual Privacy-Related Behaviors and Experiences

We adapted binary items used in prior work to gauge participants' use of PPBs [78], including whether they used "do not track" plugins, virtual private networks (VPNs), invisible browsing, ad blockers, and secure passwords, as well as whether they regularly cleared browser cookies, controlled privacy settings on social network sites, and read app and website privacy policies. We summed the *number of PPBs* participants engaged in, ranging from 0 to 8.

We measured privacy experiences with three 7-point bipolar items: how often they had personally been the victim of a privacy violation in the past (*Freq. of Privacy Victim*), how frequently they had seen or heard about online privacy violations in the past year (*Freq. of Privacy-related News*) used in Smith et al. [73], and an original item measuring their perceived frequency of coming across privacy-concerning situations online, with anchors of 1="Never" and 7="All the time" (*Freq. of Privacy-concerning situations*).

Attitudes about Privacy Lies

We asked participants six original 7-point bipolar items about the degree to which they perceived privacy lies to people and systems as common, ethical, and effective in protecting privacy. Since principal components analysis extracted one factor for these six items, we computed a variable that represents people's overall *attitudes about privacy lies*, $\alpha = .82$.

RESULTS

Our results are divided into three sections. First, we put forth a model that accounts for the individual characteristics that

predict lying as a PPB, with the goal of understanding factors beyond privacy concerns that account for this behavior. Then, we explain the results of our thematic analysis of privacy lie examples that shed light on various privacy goals, functions, and contextual factors underlying the decision to tell privacy lies in person and system contexts. Finally, we present the results of our thematic analysis of the reasons why people do not tell privacy lies to shed light on non-use behaviors to reveal hidden factors that might be at play.

RQ1: Predicting Privacy Lies

Correlations between all variables ranged from <.001 to .35, except for between privacy concerns and attitudes about privacy lies ($r = 0.54$). We ran a test for multicollinearity using the *mctest* package in R, and the highest variation inflation factor (VIF) was 1.79 (for privacy concerns). Based on the relatively low VIF values, we retained all variables in the analyses without concern for multicollinearity.

We then ran a general linear model that included 11 variables (9 predictor and 2 control variables) with frequency of lying as a continuous dependent variable. Using a stepwise regression procedure, variables were deleted one at a time based on largest p-value. Likelihood ratio tests were then run to compare the reduced model with the full model until removing a variable led to a significant difference between models. The beta coefficients, standard errors and p-values of the reduced and full models are reported in Table 1. We also computed models for each individual predictor, controlling for age and gender; adjusted r-squared values for those models as also shown in Table 1.

Controlling for age and gender, frequency of privacy lies in the reduced model was predicted by a) perceived control of data, b) general willingness to disclose online, c) the number of other PPBs people engage in online, and d) attitudes about

Themes	#	Subcodes	Person	System
Judgments about the request for information	1	Unneeded	16 (8.7%)	52 (21.1%)
	2	Inappropriate/Discomfiting	50 (27.3%)	36 (14.6%)
Perceptions of the Requestor	3	Unfamiliarity	45 (24.6%)	8 (3.2%)
	4	Distrust	15 (8.2%)	28 (11.3%)
Lies for Gain	5	Gaining a benefit	2 (1.1%)	152 (61.5%)
	6	Exploring a persona	28 (15.3%)	26 (10.5%)
	7	Privacy for privacy's sake	15 (8.2%)	20 (8.1%)
Lies of Avoidance	8	Avoiding harm in general	63 (34.4%)	54 (21.9%)
	9	Avoiding offline repercussion	65 (35.5%)	22 (8.9%)
	10	Avoiding communication	30 (16.4%)	65 (26.3%)
	11	Avoiding misuse of data	0	54 (21.9%)

Table 2. Breakdown of main themes in examples of privacy lies in interactions with people (n=175) and systems (n=236). Note that lies could exhibit multiple themes; thus, percentages total over 100%.

privacy lies. Perceived control of data and general willingness to disclose online were negatively associated with privacy lies; the number of PPBs and attitudes about the acceptability of privacy lies were positively related to privacy lies. Together, these four factors explained 35% of variance, whereas the model with privacy concerns only explained 14% of the variance. Privacy concerns was not a significant predictor in the full or reduced model when controlling for the above-mentioned factors.

Frequency of being a victim of a privacy violation did not predict the likelihood of telling privacy lies. Frequency of other privacy-related experiences (i.e., reading about privacy violations in the news and coming across privacy-concerning situations) were significantly related to frequency of privacy lies as individual predictors, but became no longer significant when controlling for the number of PPBs people engaged in.

Finally, beyond all the privacy-related measures, attitudes about privacy lies (in terms of their ethicality, effectiveness and prevalence) were the strongest predictor of lie frequency, suggesting that people consider the ethical side of lying, even when they lie for privacy reasons, as well as its utility in accomplishing their goals.

Overall, the reduced model provides a parsimonious explanation of individual-level characteristics—perceived control of data, general willingness to disclose online, use of other PPBs, and attitudes about privacy lies—that predict likelihood of engaging in privacy lies.

RQ2 and RQ3: Context and Motivations for Lying

While our model explains 35% of the variance in the frequency of telling privacy lies, this suggests that there are still other factors to uncover that underlie this behavior. Thus, we turn to an investigation of the contextual factors that may influence privacy lies: the reasons people have for telling privacy lies, and how these are influenced by their perceptions of the information request and the requestor in both person and system contexts.

To do this, we looked at the open-ended responses from 275 participants who reported telling privacy lies. Overall, 13% of participants had told such lies only to people, 38% had told only system lies, and 51% had told both system and people lies. We report on the themes that emerged from analyzing 175 person lies and 236 system lies.

Two members of the research team open-coded a subset of examples of privacy lies given by participants, which led to the development of a framework with four themes comprised of 11 subcodes. Those themes and subcodes were used to code the remainder of the dataset of lies to people (*Cohen's kappa*=.70) and lies to systems (*Cohen's kappa*=.68). Responses could be tagged with more than one code. The first two themes involve people's perceptions of the information request and the requesting party, while the second two themes represent people's motivations to gain or avoid a particular outcome. A breakdown of the frequency of the codes and subcodes can be seen in Table 2; below, we discuss each of the four themes in turn.

1. *Judgments about the request for information*: Many participants expressed strong opinions about the request for information. A common reason to tell a privacy lie was the perception that the data requested was unneeded (*Subcode 1: Unneeded*), more so in interactions with systems (21.1%) than with people (8.7%). Participants voiced frustration that requests from systems were often “unwarranted and not necessary to know” (P23) for the purposes of the interaction, such as a birthdate for “a simple registration” (P51). Research indicates that consumers are more likely to disclose their information to companies if they feel they are being treated fairly [75]; our findings suggest that a perception of unfairness can also motivate people to tell privacy lies. Perceptions of unfairness sometimes elicited emotional reactions in comments such as “they don’t deserve to know” (P34), and “it’s none of their business” (P73).

Participants often reported that the requests for information were not just unneeded, but also uncomfortable (*Subcode 2: Inappropriate/Discomfiting*) when lying to people (27.3%) and systems (14.6%). Comments from these participants suggest they wanted control over who got to see their personal information; privacy lies were a way that they could avoid “very, very personal questions” (P51) they saw as inappropriate, particularly during interactions with relative strangers who made them feel uncomfortable. People also told privacy lies in response to “invasive” (P30) requests from systems, such as P170: “I use a false social media

persona I've set up, to avoid giving systems access to my genuine accounts. I've dedicated Twitter and Facebook accounts to deal with this nonsense." They also wanted to provide information of their own volition rather than be inundated by requests, as voiced by P82, "I enjoy giving the info I want myself without being interrogated."

2. Perceptions of the Requestor: 24.6% of participants who told privacy lies to another person did so because they were interacting with someone they were relatively unfamiliar with on platforms such as Reddit, Facebook, dating websites, and online games (*Subcode 3: Unfamiliarity*). In some cases, they did not know or want to know the person at all; in others, did want to interact, but their partner overstepped personal boundaries: "I was recently on a forum and had a man start talking to me. He seemed nice and was interested in the same thing I was. We were just having friendly conversations, then he started asking more personal information. I did not feel comfortable giving him that so I lied about my name but I did tell him my age." (P70). These findings are in line with deception research that people are more likely to tell self-serving lies to people who are not well-known to them, since it would be harder to get away with telling such lies to people with whom they are familiar [85].

In contrast, unfamiliarity was rarely called out in privacy lies to systems (3.2%); instead, participants mentioned telling privacy lies to websites they used frequently. For instance, some Facebook users were concerned about both the other people who could view their data (P69) and the company itself: "Most of my Facebook information is filled with privacy lies, I think Zuckerberg demands/resells too much information" (P60). In both person (8.2%) and system (11.3%) contexts, perceived untrustworthiness could be the immediate trigger for telling a privacy lie (*Subcode 4: Distrust*). Given that trust in the requestor can be a powerful mediator between privacy concerns and eventual disclosure [37], we would have expected trust to occur more frequently in participants' responses. This is, however, consistent with the result of our survey analysis in which general trust of the Internet was found not to be significant in the overall model.

3. Lies for Gain: A factor that was much more strongly tied to privacy lies in interactions with systems (61.5%) than people (1.1%) was the motive to gain some form of benefit (*Subcode 5: Gaining a Benefit*). These privacy lies mainly involved gaining access to services or information that required some personal data during the signup process. Related to the "Unneeded" theme, participants would sometimes assess which information they thought was truly needed to accomplish their gains, being truthful about those elements while lying about bits they deemed unnecessary:

"Recently a website who doesn't need my birth date, requested it. I give the correct year, but lied about the month and day in order to protect my privacy. This information shouldn't be asked for a simple registration. I agree if they want to see if I'm over 18 (21) they could ask for my birth year, but not month and day" (P51).

Some participants told privacy lies as a way to anonymously try out an alternate identity or persona (*Subcode 6: Exploring a Persona*). This was relatively common in interactions with both people (15.3%) and systems (10.5%). For example, P20 lied about his age and gender, saying "I wanted to change people's perspective of me and to make sure I couldn't be identified." Others told privacy lies to be able to engage in stigmatized activities; for example, P64 misrepresented himself on a marijuana forum and P134 lied on a sex chat site to avoid being identified and embarrassed, while P78 provided false information to a pornographic website, stating "Given that there are but a couple of people who I can talk freely about topics such as this, and that it is a taboo subject in our culture, I'd rather not disclose [my] information." People told similar lies during direct interactions with people, for example, when expressing an unpopular political opinion (P78). In Westin's [84] taxonomy of privacy functions, such lies would serve the purpose of emotional release by allowing people a private way to deviate from social norms and rules.

The final subcategory in the "lie for gain" category was what we conceptualized as "privacy for privacy's sake", which was cited approximately 8% across interactions (*Subcode 7: For Privacy's Sake*). Comments from these participants included statements about their identities or emotions, such as "I'm a bit secretive person" (P177) and "I was feeling very private" (P16). Furthermore, these participants seemed to comprise a subset of people who value their privacy regardless of whether they perceive an additional benefit or negative consequence from revealing their information. For example, P84 stated: "I was uncomfortable using my real information, even though I felt reasonably confident that the person online would not personally do any damage with the information." This category appears to capture an enduring personal characteristic because these participants appear to fit the categorization of "privacy fundamentalists" in Westin's Privacy Segmentation Index [44].

4. Lies of Avoidance: Many participants were concerned with avoiding undesired consequences in all interactions, which emerged as another major category for engaging in privacy lies with both people (34.4%) and systems (21.9%) (*Subcode 8: Avoiding General Harm*). Such concerns might entail avoiding "unwanted attention" (P66), fraud or identity theft (P30), or harassment (P163). During interactions with people, participants were especially worried about offline repercussions such as being stalked, and consequently often lied about their location (35.5%), while offline repercussions of systems collecting data were much less salient (8.9%). (*Subcode 9: Avoiding Offline Repercussions*).

People also often lied to avoid further communication both with a person (16.4%) and with a system (26.3%) (*Subcode 10: Avoiding Communication*). With people, privacy lies served to stop unwanted communication altogether, or (parallel "Inappropriate" requests) to avoid a particular line of questioning that was perceived to be invasive while

remaining in contact (P162). In the latter case, lies were a useful way to assert personal boundaries. With systems, avoiding communication mainly involved telling privacy lies to avoid spam, often by giving fake email addresses, “so I can still investigate the offers but am not bothered by solicitations that typically follow” (P273). Finally, 21.9% of lies to systems were triggered by concerns about data management and reuse (*Subcode 11: Avoiding Misuse of Data*). These participants were often less concerned about the initial request than what may happen to their data later on: “If for some reason the information is compromised I do not want it to be extremely easy for someone to find me and figure out who I am” (P196). In contrast, people did not mention concerns about third party sharing in their responses about privacy lies to people at all.

RQ4: Reasons to Not Lie

We also sought to understand the reasons for not engaging in privacy lies through a thematic content analysis of responses from 91 participants who reported never telling privacy lies. Two coders coded the responses according to this framework (Cohen’s $kappa=.69$); all disagreements were resolved through discussion. Our findings can be organized into four main categories (Table 3), and each response was categorized as exactly one code.

Reasons for Not Telling Privacy Lies	Frequency
Unneeded	41 (45%)
Preference for another PPB	19 (21%)
Immoral/Unethical	20 (22%)
Could have negative repercussions	11 (12%)

Table 3. Reasons given by non-liars (n=91) for not telling privacy lies (percentages total to 100%)

Non-liars’ reactions broadly fell into two categories, along the necessity (“lying is unnecessary”) and ethical (“lying is bad”) dimensions. The most cited reason in the “unneeded” category was that people did not feel a need to protect their privacy online through any PPB. Participants stated that they had “very little to hide” (P61, P145) or were “like an open book” (P229). One participant drew an analogy to people who do not have the option to remain private in public spheres, stating “Famous people have to let all their information hang out there in the public, essentially that is, most of their information is known, so if they can do it I can do it” (P160). Some of them believed that no damage could come from making their personal information available online, stating “I have nothing of value in my name that someone could benefit from if they stole my identity” (P184), or “I don’t feel a threat that is tangible from exposing this information” (P45). The “Unneeded” category also comprised responses from participants who rarely came across what they believed to be unwarranted requests for personal information: “Most of the times I needed to use my personal information it has been for very necessary reasons” (P80). It’s possible that some of these participants would be more willing to lie for privacy reasons if they encountered services that asked for unneeded information, though their

threshold for determining whether an information request is warranted may be different compared to those who do engage in privacy lies.

Another reason that eliminates the need for privacy lies is reliance on other PPBs, as reported by about one-fifth of non-liars. In the face of potential privacy threat or violation, many of these participants would “simply refrain from giving the information as opposed to giving false information” (P126). In some cases, these participants may compromise, providing some information but omitting the rest: “I sometimes omit things such as my exact birthday, such as only putting month and year or just month or just year” (P357). However, sometimes certain data points cannot be omitted because they are required to access online services. In such cases, participants either choose not to sign up for the service (P357, 380) or to avoid the website altogether (P176), and only use websites that they trust (P86, P380). Similarly, when communicating with an individual, participants like P342 “would probably just stop talking to them or not answer, or find a way to circumvent the question.” Other PPBs reported by participants included secure browsing (P132) or privacy settings to ensure their information was restricted to only a few people (P153).

The other main general theme reflected the negative view on lying in general. For about one-fifths of our participants, decisions about privacy lies were first and foremost a moral issue. These participants saw it as “taking on a fake identity” (P4) and viewed themselves as honest people (P41, P79, P82, P141). They also disliked lying in general regardless of motivation, viewing it as “morally wrong” (P312) or citing religious reasons (P258, P344, P395). P270 was specifically concerned about the personal impact of privacy lies: “If I lied about myself online I would feel a sense of shame that I don’t think I would be able to shake.” In fact, some participants who *did* lie often offered partial truths – for example, saying they lived in the neighboring town – perhaps to avoid being fully deceptive.

Finally, a smaller number of participants saw lying not as intrinsically bad, but as a bad idea because privacy lies could have negative consequences: “Telling lies online can lead to a cascade of problems if someone decides to try and dig deeper into my personal history” (P154), “especially if you end up becoming friends with the person over time” (P289). This reasoning has some parallels to deception in online dating, where frequent small lies help manage social constraints and potential future interaction [76]. Participants also worried about “getting in trouble” or “banned” (P48) for providing false information in various online contexts, particularly if the “falsities didn’t line up properly” (P330). Some people saw maintaining consistency with and remembering privacy lies as too much effort: “If I provide lies online, I would have to provide a different answer to each situation. I would then have to remember those details if I want to use these websites in the future. That requires a lot of effort. I decided that the benefit of doing this is not worth

the cost” (P115), although several people who did tell privacy lies managed this by using “fake identities” where they provided false information consistently across websites.

DISCUSSION

In the following sections, we discuss the implications of our results for privacy research and design.

Implications for Privacy-Related Measures

Our findings support the need to go beyond self-reported privacy concerns and to measure privacy without asking about it directly [8]. The predictive model captured just over one-third of the variance in telling privacy lies; however, self-reported privacy concerns were not significant in this model. These findings align with research that people who report high privacy concerns may not actually act in a privacy-protective manner [12; 61]. Non-liars’ responses were interesting in this regard: in the thematic content analysis, almost half of their responses were about lying, or PPBs in general, being unnecessary—but their quantitative responses about privacy concerns were still above 5 on a 7-point scale. This suggests that explicit questions about privacy concerns might pose a social desirability, experiment demand characteristic, or priming bias, and a corresponding need for less direct measurements of privacy concerns. For instance, the actual use of non-lying PPBs was a significant predictor for telling lies, probably because this identifies people who were more able and willing to translate concerns into concrete PPBs. Moreover, questions about PPBs may have a smaller effect on priming people to think about or be concerned about privacy.

Our study also indicates a need to understand people’s attitudes about specific PPBs when studying how their privacy concerns map onto their protective responses. Although only about 20% of non-liars explicitly cited moral concerns as their main reason for not lying, the predictive model shows that people’s attitudes about the effectiveness, ethics, and prevalence of privacy lies explained more variance than any other variable alone. Since many PPBs can be construed as being misleading or obfuscating, we suspect that attitudes about (particular forms of) deception are important to consider more generally in studying privacy and PPBs, as with Bullek’s finding that some people regard differential privacy solutions that obscure data as immoral [13]. Designs could target these attitudes about deception, framing PPBs as more or less deceptive or socially normative in an effort to encourage or discourage particular PPBs depending on the design goals at hand.

The predictive model also showed that higher perceived control of data was associated with lower frequency of privacy lies. Research on the privacy control paradox has shown that perceptions of informational control can make people more likely to disclose sensitive information [7] and more likely to both engage in risky behaviors and ignore risk-related information [69]. Our results suggest that the privacy control paradox extends to privacy lies as well; there may be value in designs that help people reflect on how much control

they have over their data. Consider, for instance, a privacy nudge [82] that shows not just friends but also unknown people who might see a Facebook post based on its privacy setting.

From Data Control to Privacy Goals

The prior finding highlights a danger for individuals focused on control over their data. We suggest that common research framings of privacy as control over data and preventing information loss may be harmful, because those framings can obscure the need to consider more nuanced privacy functions (c.f., [84]).

For example, participants reported telling privacy lies to be able to explore an identity within a safe space (such as sexual orientation), in line with Westin’s concept of self-evaluation, while others told lies to vent or to explore socially unacceptable opinions without social censure, in line with Westin’s conceptualization of privacy as an emotional release. The goals of these privacy lies fit well with previous work which found that individuals need a backstage where they can explore ideas in safety [65]. People also told privacy lies to limit their communication to specific audiences of their choosing, in line with Westin’s privacy function of protected communication, and to protect or assert their freedom from external manipulation, in line with Westin’s privacy function of autonomy. Although these motivations can all be expressed in terms of control over information, we see such control more as a *means*, rather than an *end*—and considering how people think about these ends is likely to be fruitful for better understandings of privacy and privacy lies.

Consider the case of unneeded/inappropriate requests for information, which featured in about one-thirds of participants’ lying vignettes. Participants’ descriptions showed that they were less worried about losing information than they were that the request was *appropriate* in the context of the interaction. When they judged it was not, as when a person requested information too intimate or a system requested information not needed, participants used privacy lies to not just protect privacy but to also assert autonomy. This aligns with Fuster’s argument that providing inaccurate information online allows for the “preservation of the informational autonomy of individual[s]” in the face of unprecedented levels of data collection that offers them few other forms of recourse [24]; here, too, the protection of information is a means toward the function of autonomy.

Going a step further down this path, it might be more fruitful to move from thinking about “privacy functions” to thinking about “functions” more generally, and how PPBs support them. Consider Hecht et al.’s [30] paper on how people use the location field in Twitter profiles, which highlighted a number of reactions to providing location information ranging from commentary on the need for such information (“NON YA BUSINESS!!”) to self-expression and playfulness [30]. Analyzing these data purely from a privacy and information control/accuracy lens would miss important

elements that help drive what might generically look like misrepresentation.

Contextual Differences

Comparing privacy lies to people and to systems helped illuminate how people make decisions about this practice based on the interaction context. People do tell privacy lies to both people and systems online, and some high-level motivations cut across contexts (e.g., lying to avoid general harms, to explore a persona, or for the sake of being private). Other motivations, however, tended to be more salient in particular contexts. For example, people were much more likely to tell privacy lies to gain benefits from systems than from people, while potential offline repercussions were a more salient driver of privacy lies to people than to systems. Key considerations of how people evaluated the request and requestor also appeared to be context-dependent. Requests from systems that led to privacy lies tended to be seen as “unneeded” while those from people tended to be “uncomfortable”. Meanwhile, people were more likely to describe a person rather than a system they lied to as “unfamiliar”, and though “trust” was a concern raised in both contexts, compared to familiarity it was much less a concern in people than in system contexts.

Note that we are discussing these findings not because we think the main takeaway is “people raise more concerns about X in context Y than context Z” (though such information is likely useful in guiding privacy inquiries and design in particular contexts). Rather, we worry that too often—including in our own statistical model—questions about privacy concerns, willingness to disclose information, and so on, are treated in a context-independent way. This is almost certainly wrong: the answer to “how willing am I to disclose my income” or “how worried am I about my data being shared with third parties” must be “it depends”—meaning that scales, surveys, interviews, and so on need to be careful to both set and bound their contexts.

In our own case, the definition of context as systems versus people is very coarse, and though it is in line with much of the other privacy literature, we see it as a limitation. Further, in online contexts the distinction between systems and people is blurry. A privacy lie on Facebook could be undertaken either to protect against the company, from other people on Facebook, third parties, or some combination of all of them. As with surveys, system designs can (and should) provide information and guidance in ways that make certain goals, concerns, and behaviors more salient, as with the privacy nudges work from Wang et al. [82].

Limitations and Future Work

Using an mTurk sample is fairly common in recent CHI privacy research [13; 34; 79]. mTurk samples have been found to track reasonably well with national benchmark samples [19], though one risk to using them in privacy research is that mTurkers can have higher privacy concerns than average [39]. We checked for this by comparing our results to those from a large pilot study with U.S. college

students. Overall, the frequency of telling privacy lies and the depth of open-ended responses were similar between the two samples, but mTurkers passed attention checks at a much higher rate. Thus, we are comfortable that the data gives useful insights into privacy lying behaviors, although as an mTurk sample, it may under-represent older adults [35].

Our study also focused on self-reported recall-based lies, and though prior deception research argues that recall-based lies are acceptable data [70], studies in situ might lead to additional insights.

Future work could also leverage our findings to develop a more comprehensive theoretical model as well as a good predictive model of PPBs. Given that our predictive model explained 35% of the variance in frequency of privacy lies, our qualitative and context-specific findings suggest that there is room to explore how other contextual and motivational factors may be quantified to explain the remaining variance, both for understanding privacy lies as well as other PPBs in general.

CONCLUSION

In this study, we put forth an improved model to predict privacy lies that incorporates actual privacy-protective behaviors, experiences, and attitudes about PPBs in addition to traditional scales of privacy-related concerns. We then identified how contextual factors influence privacy lies during interactions with people and interactions with systems, such as perceptions of the request and requestor. Finally, we characterized the different types of privacy lies, the functions they serve, and the reasons people have for telling or abstaining from privacy lies in interactions with people and systems. Overall, our findings highlight the need to examine a range of contextual factors and motivations, beyond general privacy concerns, in understanding privacy lies as well as privacy-protective behaviors more generally.

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