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Digital Sludging in the Privacy Context: Evidence of a Multigroup Analysis

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Completed Research

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Abstract

Organizations apply aggressive tactics to harvest and exhaust data from individuals. These tactics exploit human psychology to manipulate individuals' behavior through user interface design characteristics. Because governmental regulations for data collection were introduced recently, organizations make use of digital sludging to prevent individuals from refusing the consent for the data collection – most commonly within the cookie consent. Digital sludging is characterized as excessive and unjustified frictions that increase the effort and decrease the attention of a specific choice. Hence, we conducted a vignette study to investigate digital sludging in the privacy context further. Overall, we contribute to existing research by demonstrating how privacy concerns affect the perception and interaction with the cookie consent. In addition, we outline how manipulative practices such as digital sludging influence individuals' decision-making.

Keywords

Digital sludging, sludge, privacy concerns, vignette study

Introduction

"[Sludging] creates walls and barriers" (Sunstein 2020). Within the choice architecture, the constraint of desired choices is characterized as sludging (Mills 2020). Thereby, the choice architecture represents the environment of the individuals' decisions (Thaler and Sunstein 2008). Nobel prize winner Richard Thaler first coined the term "sludge". A sludge is defined as unreasonable and unjustified frictions of choices that prevent individuals from performing requested or desired actions (Thaler 2018). Initially, sludging emerged in the offline context, where many processes in the public sector involve extensive form-filling requirements and cumbersome paperwork (Akerlof and Shiller 2015; Sunstein 2020). Over the last years, organizations have increasingly utilized sludging in their information systems (IS) to manipulate user behavior in their favor (Dan and Loewenstein 2019; Narayanan et al. 2020). In particular, organizations apply psychological principles in the user interface (UI) to constrain specific choices. This phenomenon is coined digital sludging. For example, theladders.com provides access to job listings for individuals and most of the job listings are also available on other free platforms. In order to prevent users from searching for the same job on other websites and search engines, theladders.com disables text highlighting. As a result, this makes it more difficult for individuals to search for the same jobs on other sites (Gray et al. 2018). Up to this date, existing research focuses on approaches to examine the prioritization of choice within the choice architecture of IS (Weinmann et al. 2016). Whereas the impact of digital sludging within IS literature is unexplored. In conclusion, Thaler (2020) outlines the need for research on sludging to eliminate the barriers that prevent individuals from making good decisions. One common application of psychological principles in the choices architecture is the privacy context (e.g., Bauer et al. 2021). This leads to an inevitable tension between organizational and user interests (Kroll and Stieglitz 2021). Organizations rely on collecting and gathering data for monetary benefits due to personalization. In contrast, an individual's objective is to conceal personal information (Awad and Krishnan 2006). To solve this conflict of interest, the European Union (EU) has introduced the General Data Protection Regulation (GDPR) to control and regulate organizations' data collection (Tamburri 2020). This implies that organizations must obtain consent from the individual to utilize cookies. Cookies are characterized as a collection of information that is generated by a website to identify individuals online (Tappenden and Miller 2009). Thus, organizations

apply digital sludging in their cookie consents to increase the individual's friction for the choice to reject the usage of cookies (Gray et al. 2021). Consequently, there is a significant research gap about digital sludging in the privacy context. All points considered, our research objective is to provide a deeper understanding of digital sludging concerning the cookie consent. Therefore, we conducted an online experiment with vignettes guided by the following research question:

RQ: How does digital sludging influence individuals' cookie consent?

The paper is structured as follows. First, we discuss existing research concerning privacy evaluation, consent requirements, and digital sludging. Thereinafter, we propose our research model and derive corresponding hypotheses. In addition, we provide an overview of the methodological approach and showcase the conducted vignette study. Then, we analyze the findings and evaluate the proposed hypotheses. Lastly, we discuss our results and indicate avenues for further implications.

Theoretical Background

Privacy Consent

Within IS research, privacy is described as "one's ability to control information about oneself" (Bélanger and Crossler 2011). Thereby, Burgoon et al. (1989) developed a taxonomy of privacy by outlining a social, physical, psychological, and informational dimension. The social dimension focuses on the interaction between individuals and can be violated through non-compliance with conversational norms (Kroll and Stieglitz 2021). Moreover, the physical dimension of privacy includes the availability of personal space for individuals. A breach of the physical dimension exists when individuals get contacted by another person without providing explicit consent. In addition, the psychological dimension implies the individuals' control over their affective or cognitive in- and outputs (Burgoon et al. 1989). Lastly, the information dimension is characterized as the individual's freedom of choice concerning all circumstances of private information distribution. The information dimension enhances the psychological dimension by considering that individuals occasionally are willing to distribute their personal information. Because certain services require individuals to share personal data, such as google maps requires the individuals' location (Kroll and Stieglitz 2021). Thus, individuals perform a cost-benefit analysis to evaluate whether personal information should be shared. Therefore, they assess the possible benefits and risks of personal information distribution in the so-called privacy calculus (Adjerid et al. 2018). When the expected benefits exceed the perceived risks, individuals are willing to share personal information (Smith et al. 2011). Benefits from the distribution of personal information include tailored recommendations in e-commerce webshops. Moreover, behavioral researchers indicate that individuals' disclosure evaluation is not always rational due to limited mental resources (Adjerid et al. 2018). Thus, the evaluation is dominated by heuristics, biases, and contextual cues in the privacy decision-making process (Acquisti et al. 2017). Organizations intentionally use such contextual cues in IS to maximize the collected personal information data (Acquisti 2009; Wang et al. 2014). The most dominant UI pattern concerns the cookie consent that regulates organizational usage of personal information provided through the IS (Chatzopoulos et al. 2021). Thereby, cookies collect data that individuals passively provide. Most browsers save individual information such as GPS location, metadata, and session ID automatically during usage. In conclusion, the data collected from individuals via cookie consent refers to past data and future data collection (De Hert et al. 2018). Many individuals are not aware of this extensive data collection during web browsing (Smit et al. 2014). A study by McDonald and Cranor (2010) reveals that a third of individuals lack an understanding of cookie characteristics. In addition, the study results indicate that around 75% do not have the appropriate knowledge to protect themselves against personal data distribution via cookies (McDonald and Cranor 2010). As a result, individuals get increasingly concerned about possible privacy violations of organizations (Smith et al. 1996). Privacy concerns can be defined as the worry about losing control over personal information (Tan et al. 2012). Thus, Smit et al. (2014) indicate that the individuals' privacy concerns depend on cookie knowledge, internet use, and the attitude towards privacy protection. To protect individuals, governments worldwide introduced laws and regulations to protect individuals' personal information. The most recognized regulation is GDPR within the European Union (Gray et al. 2021). Consequently, organizations are forced to ask individuals for consent regarding data collection in their IS (Nouwens et al. 2020). In general, the consents have different requirements to fulfill. First, consent must be freely given. This implies that the choice to accept or decline the processing of personal information statements is taken

without compulsion on the individual. Secondly, it is mandatory that consents with different purposes are requested apart from each other. In addition, consents need to provide comprehensive and accessible information about the processing of personal information. Lastly, consent has to be differentiable from other website content without disrupting the use of the website (European Parliament 2016; Gray et al. 2021). Within the presented legal situation, organizations manipulate individuals' behavior through digital sludging to increase the given consents concerning personal information (Kroll and Stieglitz 2021).

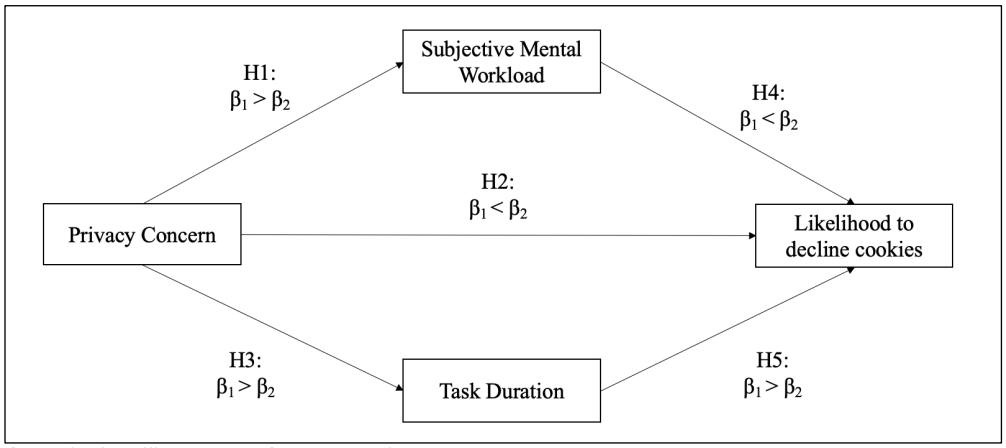
Digital Sludging

Overall, digital sludging is defined as "excessive or unjustified frictions that make it difficult for consumers, employees, employers, students, patients, clients, small businesses and many others to get what they want or to do as they wish" (Sunstein 2020) in digital environments. Digital sludging leads to frustration for individuals since access to essential goods, opportunities, and services is complicated (Sunstein 2020). The primary purpose of digital sludging is to prevent individuals from making decisions that interfere with organizational interests of money, data, and attention (Narayanan et al. 2020; Thaler 2018). For instance, digital sludges are used to complicate the process when individuals want to terminate their membership with the organization. On the one hand, the implementation of digital sludging in IS includes a systematic and intentional process to promote self-interested objectives. On the other hand, organizations create digital sludges inadvertently. This often involves bureaucrats or lawyers who focus on administrative compliance within the IS and therefore create unnecessary frictions for certain features of the IS (Herd and Moynihan 2019). As an example, about 17% of zoning licenses in Chicago were completed due to insufficient information. These low take-up rates are caused by digital sludging concerning request completion (Gresenz et al. 2012). As a consequence, digital sludging makes use of an increased time to complete a specific task because of the duplicative actions, long waiting periods, and additional time to gather and understand the respective information provided in the UI (Sunstein 2020). Moreover, digital sludging affects the individual's perceived subjective mental workload (SMW). SMW is characterized as the cognitive and perceptual work of the mental system during task completion (Eggemeier and Wilson 2020; Estes 2015). In general, SMW requires the individual to process, maintain and retrieve information (Estes 2015). Speier and Morris (2003) indicate that complexity in the decision-making process increases the perceived SMW of individuals. Increased complexity also represents one characteristic of digital sludging compared to neutral UI designs (Thaler 2018). Lastly, digital sludging affects the likelihood of the choice of being selected (Löfgren and Nordblom 2020). The UI design characteristics of digital sludges use psychological principles to change individuals' behavior towards different choices (Mathur et al. 2021). In conclusion, digital sludging affects individuals' behavior in different ways. Shahab and Lades (2021) outline different types of consequences for individuals. First of all, sludges affect the individuals' search costs. This is applicable when organizations provide too many options or confusing UI designs. As a result, it makes it more difficult for individuals to find relevant information about the possible options. Scheibehenne et al. (2010) indicate that search costs lead to decreased motivation and satisfaction with the choice. Furthermore, evaluation costs occur when a digital sludge incorporates mechanisms that hide the advantages and disadvantages of choices (Shahab and Lades 2021). In addition, digital sludges that increase the friction for desired choices lead to implementation costs. For instance, the cancellation of subscriptions can include complex and extensive processes. Lastly, psychological costs occur when negative experiences are induced by "sludged" decision-making (Shahab and Lades 2021).

Research Model and Hypothesis Development

In this section, we outline our research model and respective hypotheses. Our research model is underpinned by the theoretical foundation of digital sludging and the individual's evaluation of privacy consents. Our vignette study aims to address the outlined research gap by showcasing the effect of digital sludging compared to a neural UI design. Therefore, we carefully crafted two comparable vignettes that demonstrate the cookie consent selection of a mobile application. The first vignette involves several aspects of digital sludging, such as complicated information, uneven UI design characteristics, and increased process steps ($\beta 1$). The other vignette represents a cookie consent design where the hierarchy of the options the accept and decline cookies is even ($\beta 2$). We want to examine differences in individuals' behavior and decision-making across the two vignettes. Thereby, we focus on the relationship between individuals' privacy concerns and the perceived SMW (h1), the likelihood to decline cookies (h2), and the task duration (h3). The theoretical background indicates that digital sludging directly impacts the SMW and task duration

to alter individuals' decision-making. As a result, we are interested in how the likelihood to decline cookies is affected by the individuals' SMW (h4) and task duration (h5).



β_1: "Sludged" consent β_2: Neutral consent

Figure 1. Research Model

Privacy concerns impact the individual's willingness to share personal information with IS (Milberg et al. 2000). As a result, individuals with privacy concerns invest more time understanding the respective privacy conditions. This leads to more cautious actions of the individuals and demands more cognitive effort (Paine et al. 2007). Consequently, the consent evaluation is intensified by individuals with privacy concerns which amplifies the perceived SMW (Moray 1982). Existing research has shown that the SMW is increased when the individual is confronted with a UI that provides poor usability (Lukanov et al. 2016). The objective of usability is characterized as the effective, efficient, and satisfactory completion of a task (Green and Pearson 2006). Digital sludging involves increased complexity and effort for the targeted choice and therefore reduces the efficacy of individuals (Sunstein 2020). Thus, we hypothesize that the effect of privacy concerns on SMW is greater when individuals experience a "sludged" cookie consent:

H1: Individual's privacy concerns have a greater effect on the SMW for a "sludged" cookie consent than for a neutral cookie consent.

Existing research indicates that privacy concerns of individuals lead to more restrictive behavior regarding the sharing of personal information via cookies (Zarouali et al. 2017). In addition, Smit et al. (2014) outline that individuals with high privacy concerns are more likely to actively protect themselves against privacy threats. This implies that individuals are more likely to decline the cookie consent. Digital sludging decreases the individuals' attention to a UI element via color, placement, and size (Faraday 2000). In addition, digital sludging impacts the needed effort for the sludged option (Kool et al. 2010; Sunstein 2020). Since our vignette study applies digital sludging on the option to decline cookies, we hypothesize that it will decrease the effect of privacy concerns on the likelihood to decline cookie consent:

H2: Individual's privacy concerns have a smaller effect on the likelihood to decline cookies for a "sludged cookie consent than for a neutral cookie consent.

When individuals experience privacy concerns, they usually respond with the protection of personal information (Jiang et al. 2013). To conceal personal information, individuals must take time and understand and identify required actions. Becker (1965) initially investigated the impact of time in individuals' decision-making. Thereby, the theory of the allocation of time proposes that individuals equate the value of time to its opportunity costs (Leclerc et al. 1995). Consequently, individuals are willing to invest more time when allocating more value to the respective choices. Since privacy concerns increase the importance of privacy we hypothesize that individuals are willing to invest more time for these choices. This increases the duration of the respective task. Digital sludging often involves duplicative actions and long waiting periods for certain choices (Sunstein 2020). Consequently, we hypothesize that individuals need to invest even more time for the "sludged" cookie consent compared to the neutral cookie consent:

H3: Individual's privacy concerns have a greater effect on the task duration for a "sludged" cookie consent than for a neutral cookie consent.

SMW occurs when the individuals perform an in-depth analysis of the information provided in the UI (Speier and Morris 2003). As a result, individuals pay more attention to the content, which leads to more conscious decisions in the first place. Nevertheless, individuals try to avoid physical and psychological effort in their decision-making processes (Kool et al. 2010; Solomon 1948). This phenomenon is also coined the "law of less work" (Solomon 1948). Digital sludging increases the psychological effort via complicated and hidden information in the UI (Münscher et al. 2016). In addition, digital sludges involve extensive process flows that involve long waiting times (Petty et al. 1980; Thaler 2018). While effort initially reduces the selection of an option, individuals tend to continue the process when much effort is applied (Mirsch et al. 2018). Accordingly, we hypothesize that the "sludged" cookie consent has a lower impact on the relationship between SMW and the likelihood to decline cookies than a neutral cookie consent:

H4: SMW has a smaller effect on the likelihood to decline cookies for a "sludged" cookie consent than for a neutral cookie consent.

The task duration represents the individuals' amount of time to complete a specific task. Thus, the cognitive fit theory indicates that extensive cognitive effort is required for choices where the provided information does not fit the actual choice (Speier 2006). Consequently, individuals need more time to create a mental model for the respective outcomes of the decision. Respectively, the resulting mental model is potentially an incomplete representation of benefits and costs for the evaluated choices and leads to a decreased decision accuracy of individuals (Vessey 1994). Since digital sludging involves insufficient and complex information for specific choices, individuals likely require additional time to process their decision-making, which leads to more inaccurate decisions (Sunstein 2020). Hence, we hypothesize:

H5: Task duration has a greater effect on the likelihood to decline cookies for a "sludged" cookie consent than for a neutral cookie consent.

Vignette Study Design

We designed a full factorial between-subjects vignette study to test the proposed hypotheses. The vignette method puts the participants into a specific scenario (Atzmüller and Steiner 2010). Since the vignettes are very comparable, we selected a between-subject design to gather unprejudiced results for each of the vignettes. We carefully crafted two vignettes of a mobile application based on the given theoretical foundation (see table 1).

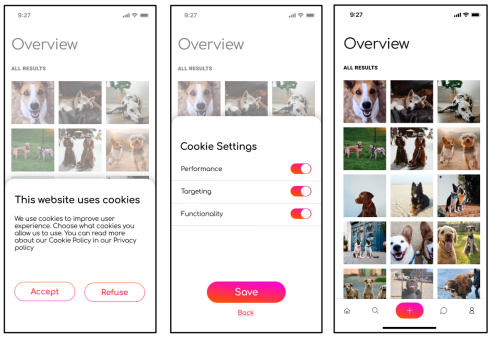
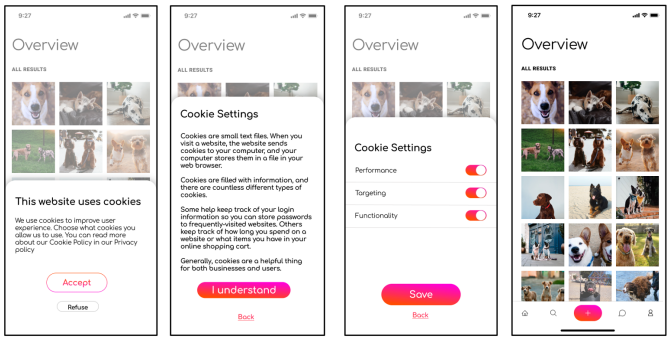
Neutral Consent	"Sludged" Consent
	

Table 1 Vignettes Overview

Both vignettes focus on the initial cookie selection process as a standard consent requirement of GDPR. The vignettes are presented to participants as an interactive prototype where free interaction with the application is possible. This involves to return to a previous page if necessary. Moreover, the task does not include the cookie selection process to ensure the participants interact unbiased with the cookie consent. The participants of the study should select their favorite dog picture out of a variety of examples. The control vignette provides a standard and neutral cookie consent (see table 1). In contrast, the manipulated vignette increases the effort and attention of the choice to decline the cookie consent. First, the button to refuse the cookies is less attentive due to its size, color, and positioning (Faraday 2000). Secondly, the effort of this choice is increased through an additional screen that provides extensive and complex information about

the cookie's settings process (see table 1). If the participants accepted the cookies, they are directly forwarded to the screen where they could select their favorite dog picture. When the participants initially decided to decline the cookie consent, they are confronted with the cookie settings dialogue (see table 1). After declined the cookies, they are also confronted with various dog pictures. Subsequently, we assess the participants' SMW in the post-study survey by using the NASA task load index (TLX) (Hart and Staveland 1988). In addition, we asked about the participants' concern of information privacy (CFIP) to examine the individual's standpoint towards privacy. The CFIP consists out of 15 items in a eleven-point Likert scale ranging from 1 (totally disagree) to 11 (totally agree) (Smith et al. 1996). In November 2021, we recruited participants through mailing lists to participate in an "online experiment" to ensure that the participants are not biased about the research topic of digital sludging in the privacy contexts. We used the user-testing application MAZE to collect the data and present the interactive vignettes. Overall, 401 individuals started our online experiment, whereas one half was confronted with the neural consent and the other half with the "sludged" cookie consent. Overall, the study was conducted among university students. Concerning the age, about one-third of the participants (33.45%) belong to the age group between 17 and 20 years. At the same time, 47.33% of the participants are between 21 and 25 years old. The remaining 21.22% of participants are older than 25 years. We excluded 34 participants from our sample because of insufficient provided information and outliers in the task duration. Our effective sample consists of 367 participants (242 males and 125 females).

Data Analysis

For the analysis of the vignette study, we conduct a multi-group analysis with SmartPLS version 3.3.3. Thereby we evaluate the relative salience and statistical significance of the proposed hypotheses in the research model. First, we tested our research model for the goodness of fit. Thereby, the standardized root mean square residual (SRMR) assesses the average magnitude of the observed and expected correlations to measure the model's fit. Thereby the overlap between the estimated model and the actual values of the model are compared. The SRMR value of our vignette study if above the threshold value of 0.08, which demonstrates sufficient goodness of fit in our model (Hu and Bentler 1998). Second, we investigated the reliability of our research model using composite reliability (CR) scores. Our CR values range from 0.72 to 1.0, and therefore exceed the recommended threshold of 0.7 (Hair 2009). Because the construct task duration is only examined by one single criterion, it leads to scores of 1.000 in different reliability and validity test. As a result, we indicate reliable results of our vignette study. Third, we assessed convergent validity and discriminant validity. We investigate the average variance extracted (AVE) in order to test the convergent validity of our study. The resulting AVE of each latent variable is in a range between 0.51 and 1.0, which is in the recommended range between 0.5 and 1.0 (Hair 2009). In addition, we use the heterotrait-monotrait ratio (HTMT) test to check for sufficient discriminant validity. The HTMT values of our constructs all smaller than 0.85 (Henseler et al. 2015). In conclusion, the tested validity criteria are satisfied, which indicats that the measurements of our constructs in the research model are distinct. First, we conducted an initial descriptive analysis of the constructs. Table 2 provides an overview of respective mean and standard deviation (SD) of our measured constructs.

	Neutral Consent (N=196)	"Sludged" Consent (N=171)
Privacy Concern	Mean: 3.81 (SD: 2.90)	Mean: 2.22 (SD: 1.24)
Subjective Mental Workload	Mean: 5.12 (SD: 2.55)	Mean: 4.46 (SD: 2.76)
Task Duration	Mean: 28.92 (SD: 18.25)	Mean: 35.85 (SD: 27.96)
Likelihood to decline cookies	Mean: 0.39 (SD: 0.49)	Mean: 0.32 (SD: 0.47)

Table 2 Construct overview

Thereinafter, the partial least squares multigroup analysis (PLS-MGA) is a well-established approach to investigate the differences between two or more groups (Henseler 2012). Before comparing the path coefficients of the different groups, we performed a measurement invariance test to ensure the accuracy of our findings (Henseler et al. 2016). We compared the outer loading differences between the neutral consent group and the "sludged" consent group on item level. Thereby no significant differences between the groups exist, which indicates invariance for the constructs of the research model. We calculated the respective path coefficients and significance levels for each group via a bootstrap analysis with 10000 bootstrap samples. Furthermore, we compared the path coefficients of the group who experienced a neutral consent (β_1) with the coefficient of the group who experienced the "sludged" consent (see table 3). In, addition, we tested for

the following significance levels: 10% (p<0.1), 5% (p<0.05), and 1% (p<0.01). Regarding privacy concerns, we hypothesized differences between the two groups in the relationships with SMW, the likelihood to decline cookies and the task duration. Thereby, the analysis shows that there is no significant difference in the path coefficients in the relationship between privacy concerns, and subjective mental workload (|ß1-ß2| = 0.107, p > 0.1). Although, our results indicate a significant positive effect of privacy concerns on the individual's SMW (see table 3). Nevertheless, H1 is rejected.

	Path	Coefficients		PLS-MGA	
		Neutral Consent	*"Sludged" Consent*	*Coefficients diff. ($\|\beta_1 - \beta_2\|$)*	*Hypotheses*
Privacy Concerns	PC→SMW	0.204**	0.311***	0.107	H1: $\beta_1 > \beta_2$ *(rejected)*
	PC→LDC	0.413***	0.198**	0.223**	H2: $\beta_1 < \beta_2$ *(supported)*
	PC→TD	0.089*	0.246***	0.157*	H3: $\beta_1 > \beta_2$ *(supported)*
Subjective Mental Workload	SMW→LDC	0.201*	-0.077	0.278*	H4: $\beta_1 < \beta_2$ *(supported)*
Task Duration	TD→LDC	-0.068	-0.038	0.030	H5: $\beta_1 > \beta_2$ *(rejected)*

*** p <0.01, ** p <0.05, *p <0.1

PC = privacy concerns, SMW= subjective mental workload, LDC = likelihood to decline cookies, TD = task duration

Table 3 Multigroup analysis test results

In addition, we find evidence to support H2 and H3. The path coefficients between privacy concerns and the likelihood to decline cookies are significantly lower (|ß1-ß2| = 0.223, p < 0.05). As hypothesized, the path coefficient between privacy concerns and task duration is higher for the group who experienced the "sludged" consent. Our results show a significant difference (|ß1-ß2| = 0.157, p < 0.1). Consequently, H2 and H3 are supported. Furthermore, we analyzed the relationship between SMW and the likelihood to decline cookies. The multigroup analysis shows individuals that experienced the neutral consent are more likely to decline cookies when they have a higher SMW compared to individuals that experienced the "sludged" consent (|ß1-ß2| = 0.278, p > 0.1). In conclusion, H4 is supported. Lastly, we investigated the group differences with respect to the relationship between task duration and the likelihood to decline cookies and found that H5 cannot be supported since the path coefficients show insufficient and insignificant differences (|ß1-ß2| = 0.030, p > 0.1).

Discussion and Conclusion

The initial motivation of our work was to uncover the impact of digital sludging on individuals during the interaction with the cookie consent. Thus, our work deals with an intersection of two important research areas. First, our work demonstrates how individuals' privacy concerns affect the perception and interaction with the cookie consent. Secondly, we indicate how manipulative practices such as digital sludging influence individuals decision-making. Accordingly, the conducted vignette study offers vital implications for research on manipulative UI designs – also referred to as dark patterns (Mathur et al. 2021). Our results show that individuals in both groups are more likely to decline the cookie consent when they have privacy concerns. Under consideration of the differences between the group, we can see that the individuals that experienced the "sludged" consent are less likely to decline than individuals who were confronted with the neutral consent (supported H2). This indicates that the increased friction of the choice to decline cookies effectively alters individuals' behaviors. Furthermore, our vignette study contributes to research by demonstrating the positive relationship between an individual's privacy concerns and the SMW. Existing research mainly focuses on the related organizational consequences of privacy concerns, such as purchase intention or technology acceptance (Malhotra et al. 2004). Our results indicate that privacy concerns lead to a more cognitively demanding interaction with the privacy consent. In addition, individuals intensify the interaction with the consent and take longer to complete the task. This effect is even more substantial when a digital sludge is involved (supported H3). In addition, we demonstrate that digital sludging significantly reduces the likelihood to decline the consent even though individuals indicate more subjective mental workload within the task (supported H4). Privacy theory mainly deals with the fundamental question of how individuals can balance their desired and achieved level of privacy (Trepte and Reinecke 2011). When individuals have privacy concerns, it leads to a higher subjective mental workload, task duration, and likelihood to decline cookies. Nevertheless, digital sludging imbalances the individual's level of privacy by making it substantially harder to decline the cookie consent. Based on our vignette study, we derive

actionable insights for organizations concerning the design of their privacy consent. It becomes clear that privacy concerns play an essential role in the individuals' consent evaluation. Thereby, organizations need to provide transparency about data usage to decrease individuals' privacy concerns (Oulasvirta et al. 2014). In addition, our study shows that digital sludging is an effective dark pattern to constraint a specific choice. However, we only investigated the short-term effects of digital sludging. Organizations need to be cautious with digital sludges. On the one hand, manipulating individuals via digital sludges raises ethical issues (Gray et al. 2018). On the other hand, digital sludging might lead to negative long-term consequences for organizations, such as ultimately terminating the membership. Our conducted vignette study has some limitations that can be addressed in future research projects. First, the results of our could be limited because of the hypothetical scenario. Although we tried to confront the participants with a very realistic scenario, some participants are aware that regardless of their choice, personal information is collected. We encourage researchers to investigate the impact of digital sludging in real-world scenarios. Second, our sample only consists of university students which limits the generalizability of our results. Future research needs to examine representative samples to verify our findings. Third, concerning our methodological limitations, we examined only the total task duration of the participants. It is important for future research to expand and refine this measurement. A differentiated investigation of how digital slugging affects the duration of single process steps could provide an essential contribution to IS research.

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