How does technology readiness affect the transfer of innovation between the professional domain and the private domain? A longitudinal study

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Abstract

Many researchers have studied innovation in terms of either employee innovation or user innovation, but much less is known about the transfer of innovative behavior between the professional and private domains. This quantitative empirical study investigates the relationship between the development of innovations by user innovators in the private domain and the transfer of the innovation to the professional domain and vice versa. Focusing on technology readiness as a moderator on the relationship between the transfer of innovation and innovative behavior in the other domain, we address the importance of digitization for innovations. The study is relied on the spillover theory and conducted as a longitudinal online survey consists of three consecutive waves over a period of four months. The result of the study demonstrates that employee innovation in the professional domain has an impact on innovative behavior in the private domain and, in reverse causality, user innovation in the private domain has an impact on innovative behavior in the professional domain. The relationship between these spillover effects and innovative behavior is strengthened by the technology readiness of innovators.

Keywords: user innovation, employee innovation, spillover theory, innovative professional behavior, technology readiness

1. Introduction

In the past century, the mechanisms of organizational innovation have attracted the attention of researchers and practitioners. The traditional understanding of innovation as employee innovation located within the firm which must be introduced to the market to be counted (von Hippel, 2016) is expanded by user innovations. User innovation refers to innovation by end users, who then expect to benefit from it through their own use, rather than from the production and sale of the innovation (Baldwin and von Hippel, 2011; von Hippel, 2005). Nowadays, an innovation is defined as "a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)." (OECD/Eurostat, 2018, paragraph 1.25, p. 32). Although prior innovation literature thus reveals separate employee-user research streams, some researchers have started to explore the boundaries between the two areas of research (e.g., Davis et al., 2013; Lukoschek and Stock-Homburg 2021).

We consider the link between employee innovations and user innovations by examining the role of behavioral knowledge flow across life domains over time. Our research demonstrates the potential for reuse of innovative knowledge structures acquired in private domains and applied in professional domains, and vice versa. Particular attention is given to the influence of innovators' technology readiness on behavioral knowledge flow between life domains.

Leveraging spillover theory (Wilensky, 1960), we explore the behavioral knowledge flow between user innovators and employee innovators, which could lead to an innovation spillover from the private to the professional domain and from the professional to the private domain. According to spillover theory, a person's behavioral manifestations regarding innovativeness in one domain (e.g., private) transfer from this domain to another domain (e.g., professional), resulting in shared or similar behaviors in the two domains (Edwards and Rothbard, 2000). With this foundation, we ask:

(1) How do user innovations spillover to job-related innovations and vice versa?

Extant literature also highlights that a digitalized environment fosters idea generation and development in the private domain (Nöhammer and Stichlberger, 2019) and professional domain (Curzi et al., 2019; Nöhammer and Stichlberger, 2019). Specifically,

URI: https://hdl.handle.net/10125/103227
978-0-9981331-6-4

digital technologies have been considered as enabler for innovation in both, the professional domain (Colbert et al., 2016; Shanker et al., 2017) and the private domain (Nöhammer and Stichlberger, 2019). Therefore, technological readiness as a person's ability to deal with digital technologies (Parasuraman, 2000) may affect the private-to-professional and professional-to-private behavior innovation spillover. Therefore, we introduce technology readiness as a contingency variable:

(2) How does technology readiness affect the strength of innovation spillover from user innovations to employee innovations and vice versa?

This research provides several important theoretical contributions. First, research on spillover highlights the huge potential of spillover between private and professional domains (Suter and Kowalski, 2021), which may also hold for innovation spillover from the private domain to the professional domain and vice versa. Only recently, a study by Lukoschek and Stock-Homburg (2021) argued for innovation spillover effects from employees' job resources to user innovation. Such a view implies that high innovation efforts in the professional domain can contribute to the acquisition of private resources. To substantiate this claim, we empirically test how the behavior of user innovators could foster the generation of employee innovation and vice versa. Our study complements research on innovation spillovers from private to professional domains (e.g., Davis et al., 2014; Schweisfurth and Raasch, 2015) and vice versa (Lukoschek and Stock-Homburg, 2021), by explaining and testing the underlying theoretical spillover mechanism.

Second, we conduct a quantitative, longitudinal study. Longitudinal studies allow for greater static efficiency and produce more accurate data than cross-sectional studies (Cohen et al., 2007). With multiple measurements taken at different points in time, we can examine individual changes over time (Ware, 1985) understanding the multiple influences on participants' behaviors (Baltes and Nesselroade, 1979).

Third, we consider a potential contingency factor by including technology readiness as a moderating variable. We test whether a person's readiness to deal with digital technologies during professional and private time affects the proposed spillover. We thus expand current knowledge on user innovation by explaining the role that innovation behavior patterns acquired in the private domain play in innovation efforts in the professional domain and vice versa demonstrating the existing knowledge flow.

2. Literature review

2.1. Relationship of employee and user innovation

Since von Hippel and Henkel (2003, p. 1) first described the relationship between user and employee innovation relatively few studies have investigated it. Instead, they focus on how to integrate user innovation into employee innovation by generating technical requirements (Di Gangi and Wasko, 2009), collaboration tools (Piller and West, 2014), and project management capabilities (de Melo et al., 2020). Others demonstrate how opposing firm and community interests can be mediated by managing new forms of membership uncertainty (Dragsdahl Lauritzen, 2017) or how the origins of user innovation affect firms' subsequent innovation performance (Yu et al., 2020).

2.2. Spillover Theory and Innovations

We rely on the spillover theory of Wilensky (1960), which states that a person's attitudinal or behavioral manifestations transfer from one life domain to another, resulting in shared or similar attitudes and behaviors across those domains (Edwards and Rothbard, 2000; Hecht and Boies, 2009). "Spillover effects refer to the impact that actions, events, and transitions in one life domain (e.g., family) have on other domains (e.g., work or leisure)" (Bernardi et al., 2017, p. 27). It can take two forms: Emotional and behavioral. Emotional spillover occurs when feelings from one domain persist after a person leaves that domain and arrives in another (Hecht and Boies, 2009). Behavioral spillover occurs when behavioral habits formed outside a domain are enacted at another domain (Hecht and Boies, 2009). For example, idea generation mechanisms applied at home enhance innovative professional behavior in the job.

Spillover effects from one domain to the other have been examined in various contexts, including professional-to-private spillover (Konze et al., 2019; Steiner and Spurk, 2019; Sthapit et al., 2021), consumer behavior, such as purchase and consumption spillover (Frezza et al., 2019; Klöckner et al., 2013; Meng and Ye, 2009), brand-to-brand spillover (Wang et al., 2020), and economic spillover, such as spillover in economic collaborations (Korinek, 2014; Levine, 1993) and global economic spillover (Frenken et al., 2007; Vang and Chaminade, 2007). Recently, spillover has been examined in the context of knowledge-transfers (Capello, 2009; Niosi and Zhegu, 2005), in particular related to entrepreneurship (Lattacher et al., 2021; Nilsson et al., 2017), product

innovation, and R&D cooperation (Capuano and Grassi, 2019).

Our study focuses on private-to-professional spillover of innovation and vice versa. These spillover effects can occur in many ways. Davis and colleagues primarily take an organizational perspective and examine the meaning of job-related ideas that occurred during employees' private time (Davis et al., 2013). They revealed that employees who continue to think about their workplaces while being away from work produce more valuable inventions (Davis et al., 2014). Schweisfurth and Raasch (2015) show that embedded lead user innovators are more active than regular employees in acquiring, disseminating, and using market need information for corporate innovation.

A primarily user-based perspective is also taken by Lukoschek and Stock-Homburg (2021). While the authors provide valuable insights that user innovators' professional environments enhance their user innovations, reversed effects are not examined. Although the authors base their arguments on conservation of resources theory (Hobfoll, 2011) and briefly mention spillover effects, they do not explicitly test its underlying mechanisms empirically. Furthermore, the authors confess: "we cannot entirely rule out the possibility of reverse causality in our data due to our cross-sectional research design" and therefore "strongly encourage future research to identify consumer innovators' upfront and adopt a longitudinal study design" (Lukoschek and Stock-Homburg, 2021, p. 10).

The question whether a knowledge flow of behavior spillover effects from user innovations in private time to employee innovations during professional time may occur has not been examined to our knowledge. Our study relies on the premises of spillover theory to examine whether innovative behaviors from the private domain result in innovative behaviors in the professional domain and vice versa. Thus, we respond to the call by Lukoschek and Stock-Homburg (2021) by examining private-to-professional innovation spillover effects and vice versa with a longitudinal study.

3. Study framework

The central proposition of our conceptual framework shown in Figure 1 is that innovative behaviors from the private domain have a positive influence on innovative behavior in the professional domain. Our independent variable relates to the innovativeness of the prototype. Innovativeness of the prototype refers to the number of novel and useful prototypes, generated by a person in a particular domain (Stock et al., 2013). We examine prototypes from the private domain —that is, user innovations— and prototypes from the professional domain—that is, employee innovations.

The mediating variables captured innovative behavioral spillover from two perspectives, private-to-professional spillover and professional-to-private spillover. Innovation spillover private-to-professional occurs when innovative behavior habits formed in the private domain are enacted in the professional domain. Specifically, innovative behavior habits in the private domain enhance innovative professional behavior. In contrast, professional-to-private innovation spillover occurs when innovative behavior habits formed in the professional domain are enacted in the private domain.

The dependent variable captures innovative behavior in the private and professional domains. Innovative professional behavior refers to the "extent to which [employees] generate new problem-solving ideas and transform these into uses" (Stock, 2015, p. 574). Accordingly, innovative private behavior refers to the extent to which people generate new problem-solving ideas in the private domain and transform them into uses. Our framework also includes as control variables age and gender that presumably affect the dependent variables (i.e., innovative behavior).
Furthermore, this study examines how technology readiness as contextual factor affects the strength of the spillover–innovation behavior relationship. Technology readiness "refers to people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Lin et al., 2007, p. 643). It is important to examining this contextual factor because "ignoring or downplaying the role of context makes a phenomenon under investigation difficult to understand and might account for the varied and contradictory outcomes of extant shift work research" (Suter and Kowalski, 2021, p. 518).

4. Hypotheses

4.1. Innovation and Spillover effects

Relying on spillover theory, we suggest that behavioral habits to innovate in the private domain may trigger innovative professional behaviors for several reasons. First, the spillover theory assumes that acquired skills and behaviors can be transferred across life domains (Edwards and Rothbard, 2000). This transfer occurs when resources formed outside of one domain are translated into another domain (Konze et al., 2019). In this process, knowledge structures and habits are generalized at an abstract level and exported to the situational domain. These behavioral transfers are more likely to occur between structurally similar content areas (Edwards and Rothbard, 2000). In our

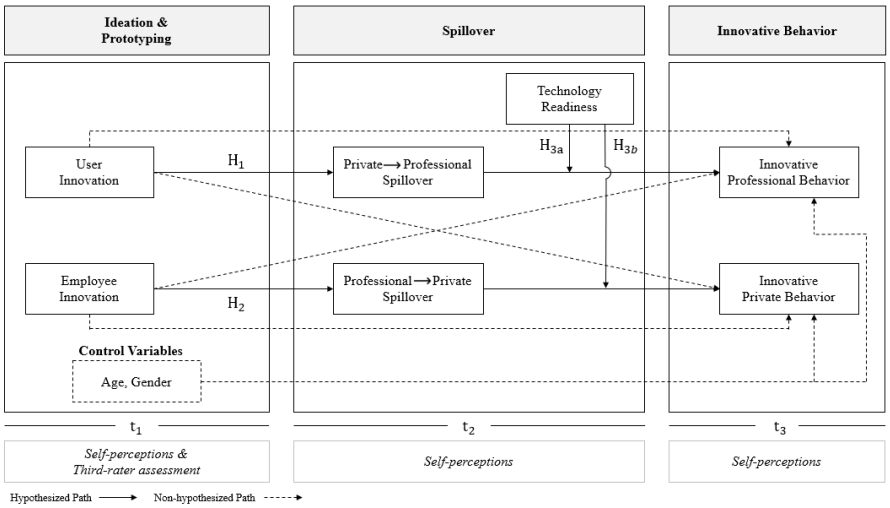

Figure 1. Framework of the study

study, we focus on the content area of innovation in both private and professional domains.

Second, the literature indicates that positive spillover effects exist between private and professional domains (Hakanen et al., 2011; van Steenbergen et al., 2007). Third, research on employee innovation suggests that employees often draw key resources from domains other than those in which they develop innovations (Davis et al., 2013). For example, employees who engage in invention in their private time often gain knowledge from the activity, which then provides key input for their professional-related innovations (Davis et al., 2013). Knowledge generated in the private domain thus contributes to the development of innovations in the professional domain (Schweisfurth, 2017; Schweisfurth and Raasch, 2015). Cognitive resources such as innovation experience and process knowledge acquired in the private domain may be useful for innovative professional behavior. Thus:

H1: User innovation positively affects innovative professional behavior through private-to-professional spillover.

Conversely, we assume that spillover theory can also be applied to the transfer of skills and habits from the professional domain to the private domain. First, according to spillover theory, acquired skills and behaviors can be transferred across life domains (Edwards and Rothbard, 2000). Thus, user innovators' innovative behaviors are based on relevant knowledge acquired in other domains (e.g., Lüthje et al., 2005; Schweisfurth, 2017), such as the private domain.

Second, extant literature has shown that behaviors and skills can be transferred from the professional domain to the private domain (Greenhaus and Powell, 2006; Hakanen et al., 2011; ten Brummelhuis and Bakker, 2012). Third, user innovation research provides examples of user innovators being able to apply resources from the professional domain in the private domain, and to transfer these resources into user innovations (e.g., Lüthje et al., 2005; Schweisfurth, 2017). Enhanced professional-related resources by innovative behavior at work (Lüthje et al., 2005; Yuan and Woodman, 2010) such as knowledge abstraction, can enhance creativity and innovation success by consolidating analogical thinking and knowledge recombination (e.g., Dane, 2010; Franke et al., 2014; Schweisfurth, 2017). Similarly, creativity (Davis et al., 2013) and innovation activities (Lukoschek and Stock-Homburg, 2021) in the professional domain have been argued to support private inspiration. Harrison and Wagner (2016) confirm the resource-enhancing effects of creativity-related tasks in the professional domain on the private domain. In sum:

H2: Employee innovation positively affects innovative private behavior through professional-to-private spillover.

4.1. Moderator Hypotheses

We hypothesize that innovation spillover across professional and private domains is moderated by technological readiness. First, technology readiness determines the willingness to adopt and use technologies in both professional and private settings (Parasuraman, 2000). This leads to greater overlap between the two domains (Ramarajan and Reid, 2013; Reyt and Wiesenfeld, 2015) and thus situational alignment between the domains, facilitating the

transfer of resources and across them (see Pervin, 1989; Schneider, 1983).

Second, digital environments foster the generation and development of ideas in both the professional domain (Curzi et al., 2019; Nöhammer and Stichlberger, 2019) and the private domain (Nöhammer and Stichlberger, 2019). By using digital technologies, "individuals [are empowered] in creating products, services, processes, and behaviors" (de Jong et al., 2021, p. 109). In turn, digital technologies trigger innovation in professional (Colbert et al., 2016; Shanker et al., 2017) and private domains (Nöhammer and Stichlberger, 2019). People experience structural convergence because they use technology for the same purpose in both domains, and the transfer of innovative behavior is more likely between structurally similar domains (Pervin, 1989; Schneider, 1983). Third, technology-based communication facilitates the integration of user innovators in corporate problem-solving processes (Hienerth et al., 2014), in user innovation in general, and in open collaborative innovations (Baldwin and von Hippel, 2011). As a result, the innovation structures of the two domains merge. We hypothesize:

H3: Technology readiness strengthens the positive relationship (a) between private-to-professional spillover and innovative professional behavior and (b) between professional-to-private spillover and innovative private behavior.

5. Method

5.1. Data collection and sample

To assess the above research questions, we conducted a longitudinal online survey consisting of three consecutive waves with an interval of eight weeks over a period of four months (June 2020–October 2020). For each wave, participants were recruited via a micro-tasking platform that counts 2.2 million workers working mainly on micro tasks (Ambati et al., 2011). For our study, we provided an incentive of €3.50 for each completed survey to the participants which is found appropriate to motivate subjects to participate. In each wave, the survey was kept open to participants for an average of 48 hours to ensure comparability of within wave results. Although several reminders were sent, only about one third of the initial 970 participants (n = 330) completed all three waves. The main reason for drop-outs might be the relatively long period of 4 months between the first and the third wave.

After completion of the third wave, we prepared the raw data by deleting participants with incomplete or completely missing data for any particular wave. In general, micro-tasking platforms are considered a viable venue for obtaining high quality data given that quality control measures are in place (Aguinis et al., 2020). On top, we checked for the consistency of the longitudinal data by including at least two attention checks and a cookie-controlled mechanism to prevent multiple entries by a single participant. In combination, these measures ensure the quality of the participant data. We matched the three waves using a unique identifier, generated at the beginning of each survey.

To be sure the participants were correctly matched, we manually screened the data and analyzed the correlations of relatively stable demographics such as age ($r = .992$; $p < .001$The final sample size is 330 respondents, of whom 38 percent are women and 62 percent are men. Participants' average age was 38 years (SD = 10.76). 26 percent of the participants were aged 20-29 years, 34 percent were in the 30-39 years age group, 20 percent ranged from 40-49 years. Only 3 percent were 60 and older. The majority (84 percent) of the participants were employed workers while 16 percent were self-employed and freelancers. About half the participants (49 percent) had a Bachelor or Master degree, 28 percent had a high school degree required to gain higher education and the remainder (21 percent) had a secondary or lower degree. The participants had an average of 13 years of professional experience (SD = 10.45, ranging from 1 to 44 years) representing a variety of industries, such as consumer goods (29.9 percent), public sector (21.4 percent), IT, communication, and electronics (20.2 percent), finance, insurance, and consulting (15.5 percent), automotive, logistics, and transportation (9.9 percent), retailing (6.9 percent), and pharmaceuticals and chemicals (4.2 percent).

5.2. Measures

Innovation: Our independent variable relates to the innovativeness of the prototype. Innovativeness of the prototype refers to the number of novel and useful prototypes, generated by a person in a particular domain (Stock et al., 2013). To measure innovation as independent variables, we combined the number of ideas generated by the participants in a private context (M = 1.65; SD = 2.44) and a professional context (M = 1.31; SD = 2.18) with a perception measure of self-rated prototyped innovations, gathered with one item in wave 1: "In my private [professional] domain, I developed and prototyped meaningful ideas". The resulting Idea Score consists then of both Idea Score Private (ISPri) and Idea Score Professional (ISPro), which represent self-reported counts of the number of ideas a participant generated within the past year,

assessed in the first wave. We measured it separately to reflect a private setting (= number of prototyped or implemented during private time, i_{Pri}) and a professional setting (= number of prototyped or implemented ideas during professional time, i_{Pro}). The self-perceived meaningfulness of the prototyped or implemented idea (m) is assessed by asking the participant about the degree to which they developed new and meaningful ideas, on a 7-point Likert-type scale. The measure was transformed to a scale ranging from 1 to 100 percent.

Based on these measures, we created two innovation scores, one reflecting user innovation and the other reflecting employee innovation. We can discount the number of ideas generated by multiplying it with a meaningfulness score (m), thereby indicating usefulness and innovativeness. Consequently, the formulas for user innovation (UI) and employee innovation (EI) are

$$UI = \frac{\sum i_{Pri} \cdot m}{100} \quad \text{and} \quad EI = \frac{\sum i_{Pro} \cdot m}{100}$$

To validate the meaningfulness of the ideas, we manually screened the respondents' descriptions of solutions, provided in a free text field, which initially suggested generally good validity of the reported ideas. Moreover, inspired by the processes described in Amabile (1982) we arranged for an independent coder to evaluate the ideas in terms of perceived innovativeness, resulting in a 7-point Likert-type scale with anchors from 1 (not meaningful at all) to 7 (absolutely meaningful). After a training about innovativeness, a subjective scorer rated the innovativeness of the created innovation, defined as "the extent to which a consumer innovation embodies new technology and/or functionalities, and is deemed original" (de Jong et al., 2018, p. 490), using three items, developed by de Jong et al. (2018). We found significant positive relationships between the independent rater's innovativeness score and the self-assessed innovation for both, user innovation ($r = .209$, $p < .001$) and employee innovation ($r = .141$, $p < .01$).

Behavior-Based Instrumental Spillover: Spillover was measured in wave 2 by adapting a 4-item scale of behavior-based instrumental spillover, developed by Hanson and Hammer. (2006). In the case of behavior-based spillover professional-to-private (SProPri), the measure reflects the degree to which "values, skills, and behaviors transferred from work are instrumental in helping people carry out family responsibilities" (Hanson et al., 2006, p. 254). Sample items used for SProPri are: "Skills developed at work help me with my private life", "Successfully performing tasks at work help me to more effectively accomplish private tasks".

For behavior-based spillover private-to-professional (SPriPro), the analogous definition is applied. The items used for SPriPro are reformulated items of SProPri to reflect the changed direction, e. g., "Skills developed in my private life help me with my professional life". The items were measured on a 7-point Likert-type scale. For both 4-item scales, a principal component analysis resulted in a single factor, and the Cronbach's alpha values were .91 for SProPri and .94 SPriPro.

Innovative Behavior: The dependent variables were innovative professional behavior (IProB) and innovative private behavior (IPriB), measured in wave 3. IProB reflects the degree to which a participant uses innovative behaviors in the professional domain; IPriB reflects innovative behavior in the private domain. IProB was measured using polarities that we later transferred to a 7-point Likert-type scale, developed by Stock (2015). Sample items of that construct were: "I am significantly less vs. more innovative in my job", "I am significantly less vs. more innovative in my private life", "I can think of significantly less vs. more innovative solutions", "I have significantly more vs. less ideas". The Cronbach's alpha value was for the IProB construct .93 and for the IPriB construct .91.

Technology Readiness: As a potential moderator of the spillover – IProB and the spillover – IPriB relationships, we measured technology readiness in the third wave. Technology readiness determines the willingness to adopt and use technologies in both professional and private settings (Parasuraman, 2000). To measure technology readiness, we used a reduced 5-item scale, originally developed by Parasuraman (2000) and applied by Westjohn et al. (2009). Sample items were: "In dealing with information and communication technologies (ICT) …I know that I will be successful if I don't give up", "…I still know how to get there", "…I always find a solution no matter what". All items loaded on a single factor, and the Cronbach's Alpha value was .92, showing excellent internal consistency of the construct.

6. Results

To test our hypotheses, we applied structural equation modeling with latent interactions in the program MPLUS (Muthén and Muthén, 2017). MPLUS offers the possibility of testing latent variable interactions based on case wise interactions that avoid information loss and exploit the variance available in the data (Marsh et al., 2006), which is needed to test our hypothetical framework. To assess the latent interactions of the moderating variables and

independent variables, main and interaction effects are separately assessed (Lukoschek and Stock-Homburg, 2021).

We further used an integration algorithm to calculate our moderation (Asparouhov and Muthén, 2007). We created our latent variable interactions using the XWITH command. This method is comparable to the latent moderated structural equations (LMS) method of Klein and Moosbrugger (2000). In our case, the joint distribution of indicators for predictors and indicators for outcomes is represented as a mixture of normal, and the mixture parameters are estimated simultaneously with the model parameters (Woods and Grimm, 2011).

The fit parameters of the model yield satisfactory results, i.e., with a $\chi^2/df = 3.16$; confirmatory fit index of .905; Tucker-Lewis index of .892, standardized root mean residual of .148 and a root mean square error of approximation of .081. Thus, it can be concluded that the model shows satisfactory fit overall (Forza and Filippini, 1998; Greenspoon and Saklofske, 1998; Hair et al., 2010). We find full support for the proposed effect in H1 of user innovation on private-to-professional spillover (ß = .123, p < .001) and in turn innovative professional behavior (ß = .098, p = .023). In support of H2, employee innovation positively affects professional-to-private spillover (ß = .088, p = .017), and in turn innovative private behavior (ß = .103, p = .049).

To test the hypothesized moderated effects, we employed a stepwise approach with separate analyses for each interaction term, in which we included latent interactions between the moderator and the respective independent variables. We mean-centered all indicators before multiplying their values (Algina and Moulder, 2001; Marsh et al., 2006).

Consistent with H3a, we find a positive moderating effect of technology readiness on the relationship between SPriPro and IProB, according to the significant interaction term (ß = .126, p < .001). Similarly, in accordance with H3b, technology readiness has a positive moderating effect on the link between SProPri and IPriB, with a significant interaction term (ß = .159, p < .001). This result points to technology readiness as an amplifier of the spillover– innovative behavior path. Among the control variables, we find no effects of age ($ß_N = .003$, $p_N = .522$; $ß_W = .000$, $p_W = .925$) and gender ($ß_N = .160$, $p_N = .129$; $ß_W = .015$, $p_W = .883$).

7. Discussion

Prior Literature focused on innovation in terms of either employee innovation or user innovation, yet considerably less is known about the spillover of innovative behavior between these two domains. To the best of our knowledge, this study is the first to examine the relationship between the development of user innovations in the private domain and the behavioral knowledge flow of innovation to the professional domain, and vice versa. Thereby Particular attention is given to the influence of innovators' technology readiness on behavioral knowledge flow between these life domains. Relying on spillover theory, we provide important insights:

First, we identify a positive spillover of innovative behavior habits from the private domain to the professional domain and vice versa. Our user-based research expands current knowledge on user innovation and employee innovation, particularly regarding the benefits of innovators' dual roles as users and employees. It elucidates the bilateral spillover directions of innovation efforts and extends research on resource spillovers in general to include transfers of intangible resources across different domains (e.g., Hakanen et al., 2011; van Steenbergen et al., 2007; ten Brummelhuis and Bakker, 2012). We thus contribute specifically to research on innovation spillover effects from private to professional domains (e.g., Davis et al., 2013; Schweisfurth and Raasch, 2015) and vice versa (Lukoschek and Stock-Homburg, 2021) by explaining and empirically investigating the underlying mechanism. In so doing, we reveal the equal impacts of spillover effects in both directions, which implies that transfers of innovative resources are independent of the acquisition or application domain. People can transfer their innovative behaviors from their professional domains to their private domains and vice versa with equal impact

Second, because our research design is longitudinal, we were able to collect accurate data (Cohen et al., 2007), examine individual changes over time (Ware, 1985), and account for influences on participant innovation behavior (Baltes and Nesselroade, 1979). In particular, our observation over a longer period of time helps us understand the complexity of the spillover effect (Alasuutari et al., 2008).

Third, in line with our prediction, technology readiness positively moderates the relationship between the spillover effect of user innovation and innovative professional behavior and vice versa, such that we extend existing research on digitization as a reinforcing instrument for innovation in the professional (Colbert et al., 2016; Shanker et al., 2017) and private domains (Nöhammer and Stichlberger, 2019), according to the insight that technology readiness positively influences the relationship between spillover and innovative behavior. By focusing on innovators' technology readiness, we

demonstrate the importance of individual attitudes toward digitization (Parasuraman and Colby, 2015) to the transfer of innovative behavior between private and professional domains.

8. Limitations und Further Research

The study has limitations that suggest opportunities for further research. First, our findings are based on self-reported and third-rater subjective measures. In particular, the self-reported measures may cause a common method variance. Research with objective data sets would support the validation of the measured effects and the generalization of the research findings.

Second, this study focuses on user and employee innovation, specifically on an individual innovator. A promising extension to our study would be to consider the innovative spillover effects on open innovations. In this context, continued research could sharpen the understanding of the technology readiness moderator by investing its effect on the relationship between the spillover effect and open innovation (see Baldwin and von Hippel, 2011).

Third, we examined the basic model in terms of technology readiness as a moderator. Continued research could extend our basic model by adding more moderators to deepen the conceptualization of innovative spillover between private and professional domains. Fourth and relatedly, the focus of our model on innovative behavior as an outcome variable in the private and professional domains could be enhanced by adding other outcome variables such as the diffusion behavior of innovators (Morrison et al., 2000) to gain more comprehensive insights.

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