



The “What”, “Why” and “Whom” of Interrole Interference Among Home-Based Teleworkers

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Abstract

Many employees are drawn to work-from-home arrangements based on expectations that such arrangements will help them manage both work and home life more effectively. Yet, mixed empirical findings suggest that telework arrangements do not uniformly result in less interrole interference (i.e., work-home and home-work interference). Applying and extending a border theory perspective, the present research offers insight into what factors may predict interrole interference, mediating mechanisms that may explain why such interference occurs, and a moderator that tests for whom interference is most damaging when employees work from home. Specifically, we test cross-role interruption behaviors as a predictor of interrole interference, with recovery experiences as a mediator of this relation and work-life border segmentation preference as a moderator. A sample of 504 home-based teleworkers recruited through Amazon’s Mechanical Turk participated in a three-wave survey. Results from a structural equation modeling approach support our overall model. However, the extent *and* valence of the impact of cross-role interruption behaviors had on teleworkers’ interrole interference depended on the direction of the interruption, type of recovery experience, and personal work-life border preference. These findings provide theoretical and practical insights that may help explain the gap between expected and actual occurrence of interrole interference in home-based telework arrangements.

Keywords Telework · Work-family · Interruptions · Cross-role · Border · Recovery

The popular press warns that the traditional office space is, at worst, “dead” and, at best, becoming an “abstract concept” (Meister, 2013). In its stead, home-based telework is gaining traction with an overwhelming 4.3 million Americans working primarily from

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home, representing 140% growth in the past decade (Global Workplace Analytics, 2017)– not to mention continued growth projected in the wake of the COVID-19 virus (Kelly, 2020). Home-based teleworkers complete some or all work tasks in their home environment rather than at work (Bailey & Kurland, 2002; Gajendran & Harrison, 2007). Organizations offer such arrangements, in large part, to help employees more flexibly balance their work and personal lives (Allen et al., 2015). Yet empirical evidence suggests that telecommuting is an inconsistent and underwhelming tool for minimizing interrole interference (e.g., Allen et al., 2013; Gajendran & Harrison, 2007; Mesmer-Magnus & Viswesvaran, 2006), with some findings suggesting that it may even enable such interference (Boswell & Olson-Buchanan, 2007; Duxbury et al., 1992).

Leveraging border theory (Clark, 2000), we examine whether this apparent contradiction between intended and actual effect may stem from three gaps in the literature, all of which are rooted in the likelihood that working where you live is not uniformly beneficial or uniformly harmful for interrole interference. First, we attend to *what* aspects of integrating one's work and home lives are problematic (i.e., interference-inducing) in a home-based telework setting. Although some degree of overlap between work and home is inherent to home-based telework, research shows that teleworkers vary in how they manage this overlap (Golden, 2012; Sullivan & Lewis, 2001). Thus, rather than categorically comparing the interrole interference of home-based teleworkers to that of traditional workers, we examine various experiences within home-based telework arrangements to recognize the heterogeneity within this group. We focus on cross-role (i.e., work-to-home and home-to-work) interruptions as prototypical experiences that integrate the home and work domains (Kinnunen et al., 2016) and that may be especially common for home-based teleworkers – but may also occur to differing degrees among teleworkers, thus differentially predicting interrole interference. Further, the potential differential effects of work-to-home versus home-to-work interruption behaviors are explored to specify *what* aspects of working and living in the same place are harmful and the nature and extent of that harm.

Second, we examine mediating psychological mechanisms that explain *why* cross-role interruption behaviors may induce home-based teleworkers' interrole interference, including consideration of potential opposing (i.e., interference-inducing and interference-inhibiting) mechanisms that may suppress overall effects. Specifically, we build on a recent empirical model (Wepfer et al., 2017) to position leisure experiences as mediators connecting cross-role interruption behaviors to interrole interference. By studying specific leisure experiences (i.e., psychological detachment from work, control over leisure time), we parse out potential positive *and* negative indirect effects, aligned with the premise that home-based telework offers advantages and disadvantages (Cooper & Kurland, 2002; Hartig et al., 2007) that, when considered together, may provide explanation for the inconsistent direct effects in previous research. Third and finally, we turn to border segmentation preference as a moderator that may clarify for *whom* integrating work and home may be of substantial concern. We draw from previous research suggesting that integration does not result in extensive interrole interference if a person prefers their work and personal lives be intertwined (Chen et al., 2009). In this way, home-based teleworkers' differential responding to cross-role interruption behaviors, based on

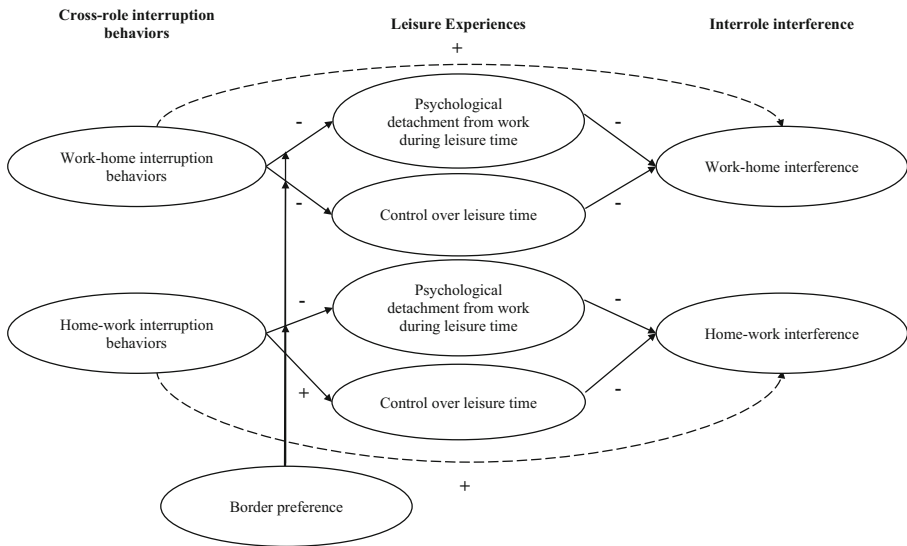


Fig. 1 Full hypothesized model

their border preference, may also explain discrepant effects in past research. The overall conceptual model is depicted in Fig. 1.

Overall, the present model gives needed attention to a core issue among a unique and growing sector of the workforce. Specifically, we propose that the confusion surrounding whether home-based telework helps or harms interrole interference exists because people's experiences working from home differ; effects may range from harmful to benign to mixed, and the extent of the effects may vary from person to person. Our model posits that different teleworkers experience differing degrees of interruptions across the work and home domains, which in turn shape leisure experiences and subsequent interrole interference – with ameliorated effects seen for teleworkers who prefer integration. The present findings not only examine the replicability of past work-family research in a home-based telework context, as scholars have long called for (Allen et al., 2013; Golden et al., 2006; Lewis & Cooper, 1999), but also expands upon a recent model (Wepfer et al., 2017) and border theory (Clark, 2000) to explain psychological links connecting a work-life experiences to interrole interference. Further, in recognizing the impact of home-based teleworkers' heterogeneous experiences and individual differences on their work-home interference, we make more targeted practical recommendations for home-based workers hoping to minimize interference, rather than general recommendations that may not be equally effective for everyone in this group.

A Border Theory Perspective

To explain how home-based teleworkers' work and non-work worlds collide, we apply border theory (Clark, 2000). Border theory proposes that work and home represent two life domains that are distinct in the tasks and roles they encompass (Blood & Wolfe, 1960). The two domains are separated by *borders* which describe spatial, temporal,

and/or psychological “fences” around work and home roles (Nippert-Eng, 1996). Within this theory, people are called *border crossers* because they are involved in the creation and maintenance of their own borders (i.e., via *border enactment*) as they define and organize the work and home domains.

Borders can be classified on a spectrum from weak to strong. Weak borders are characterized by high flexibility (i.e., contraction and expansion of a domain based on relative demands of the other), blending (i.e., creation of a “borderland” that is not physically, temporally, or psychologically exclusive to either domain), and permeability (i.e., entrance of elements from one domain into another). Strong borders are characterized by low flexibility, blending, and permeability (Clark, 2000). The strength of the work-home border then has implications for interrole outcomes, specifically interrole interference in the present study. *Interrole interference* occurs when role pressures from the work and home domains are incompatible (Frone, 2003), and it encompasses both work-to-home interference (WHI) and home-to-work interference (HWI). These incompatibilities between the two core life domains pose a significant threat to a variety of work outcomes (e.g., job performance), family outcomes (e.g., family satisfaction), and individual outcomes (e.g., depression; Amstad et al., 2011). According to border theory, weak borders allow demands to cross domains, creating interrole interference and causing harm across domains. Conversely, strong borders can block and reduce interrole interference.

With this theoretical foundation in mind, border theory can now be applied to home-based telework arrangements. By completing some or all work tasks in the home domain (Bailey & Kurland, 2002), home-based teleworkers inherently experience flexibility regarding where work is done and often flexibility regarding when and how work is done (Shockley & Allen, 2007). In addition to flexible borders, home-based teleworkers also enact blended borders that create physical overlap and potential temporal and psychological overlap between domains. Although some border flexibility and blending are theoretically expected in home-based telework arrangements, the third element of border strength – extent of actual, enacted permeations from work to home and home to work – may vary across home-based teleworkers, with crucial implications for interrole interference.

The “What”: Cross-Role Interruption Behaviors

A primary way that the domains can permeate one another, and thus allow interrole interference, is through cross-role interruption behaviors. *Cross-role interruption behaviors* occur when a border crosser allows intrusions from one domain to the other, prompting them to psychologically and/or behaviorally transition to the intruding domain (Kossek et al., 2012; Matthews et al., 2014). For instance, a teleworker attending to a family member requesting a favor during their work hours is a *home-to-work interruption behavior* whereas answering a phone call from a colleague during dinner is a *work-to home interruption behavior*. Scholars have described cross-role interruption behaviors as “the most fundamental characteristic of boundary management” (p. 103; Kinnunen et al., 2016), and the physical proximity of the work and home domains in home-based telework positions make cross-role interruption behaviors an especially relevant permeation experience for these workers. As mentioned,

border theory asserts that border strength (including permeability) shapes work-family outcomes like interrole interference. Here, permeations in the form of cross-role interruption behaviors theoretically allow demands from one domain to enter the other, which has in turn been linked to interrole interference in a traditional work context (Loerch et al., 1989; Matthews & Barnes-Farrell, 2010; Williams & Alliger, 1994).

Overall, we will replicate a hypothesis (i.e., cross-role interruption behaviors positively predict interrole interference) previously supported in past research on traditional workers, now in a home-based telework context. Expanding upon this overall hypothesis, however, it is important to note that border crossers do not have one border between work and home but two: one that separates work from home and another that separates home from work. The two borders may then differ in permeability (Clark, 2000). For instance, it is possible for a home-based teleworker to experience many home-to-work interruption behaviors but few work-to-home interruption behaviors, or vice versa. Per Williams and Alliger's (1994) model of work-family perceptions, specific life experiences, such as cross-role interruption behaviors, culminate in global judgments, such as interrole interference; the direction of interruption experiences is notable because it should carry over to the direction of the overall interference judgment, specifying the current hypothesis. If work-to-home interruption behaviors allow work demands to permeate into the home domain, these interruptions should relate to perceptions of work-home interference as a global judgment of these relevant, specific experiences. Similarly, home-to-work interruption behaviors allow home demands to permeate into the work domain, so these interruption experiences should relate to subsequent perceptions of home-work interference.

- *Hypothesis 1: Cross-role interruption behaviors will positively predict later interrole interference such that (a)work-to-home interruption behaviors positively predict work-home interference and (b)home-to-work interruption behaviors positively predict home-work interference.*

The “Why”: Detachment and Control as Conflicting Mediating Mechanisms

Although border theory identifies the enacted border characteristics that facilitate or block interference, information is missing about the underlying psychological mechanisms connecting border permeability to interrole interference perceptions. What occurs in the borderland, created by frequent permeations from one role to the other, that contributes to interrole interference? A recent empirical model by Wepfer and colleagues (2017) points to leisure experiences as a key mediator linking work-home border characteristics to work-life outcomes. Conceptually, Wepfer and colleagues argue that weak and/or integrated work-home borders leave less time and opportunity to devote to positive leisure experiences, causing strain in the form of lowered well-being and work-family outcomes. The resulting mediation model is supported in their own results and several other studies (Barber & Jenkins, 2014; Barber et al., 2019; Dettmers, 2017; Kinnunen et al., 2016). Tying Wepfer et al.'s model back into border theory, weak borders (e.g., those characterized by frequent cross-role interruption behaviors) may transform leisure time, in the home domain, into a borderland wherein

a person cannot fully absorb themselves in leisure or work, creating a feeling of incompatibility between the domains in the form of interrole interference.

The present study extends Wepfer et al.'s model by taking a more fine-grained look at the specific leisure experiences that may explain the relation between cross-role interruption behaviors and interrole interference. Specifically, we pose that *work-to-home interruption behaviors* (e.g., work emails, phone calls, unexpected assignments) can permeate leisure time in two main ways: psychologically, via work-related thoughts that require mental investment, and temporally, via work demands that require time investment. Psychological work-to-home permeation caused by work-to-home interruption behaviors counteracts the positive leisure experience of *psychological detachment* from work during leisure time, or mentally distancing oneself from work thoughts (Etzion et al., 1998). Reduced detachment is then expected to predict greater work-home interference, given that taking time to mentally separate oneself from the demands of work facilitates rest and recovery needed to effectively manage the two domains (Demskey et al., 2014; Dettmers, 2017). Temporal work-to-home permeation caused by work-to-home interruption behaviors is expected to undermine the positive leisure experience of *control* over leisure time, or the perception that one has discretion over the timing, duration, and content of their non-work activities (Sonnentag & Fritz, 2007). Control gives workers the opportunity to utilize their leisure time in ways that best fit their own needs and desires in the moment and thus can help manage and reduce work-home interference (Molino et al., 2015).

Here, we position cross-role interruption behaviors as a prototypical manifestation of weak, permeable borders that are especially relevant or likely in a home-based telework arrangement. According to Wepfer et al.'s model, cross-role interruption behaviors should predict work-home interference through reduction of leisure experiences. Specifically, we hypothesize the positive relationship between work-to-home interruption behaviors and subsequent work-home interference is mediated by lower leisure-time psychological detachment from work and lower leisure-time control.

- *Hypothesis 2: The positive relation between work-to-home interruption behaviors and later work-home interference is mediated by (a)leisure-time psychological detachment and (b)leisure-time control.*

Thus far, home-based teleworkers' border permeability, in the form of cross-role interruption behaviors, is expected to heighten interrole interference. Yet, as mentioned, previous research examining the impact telework has on work-home interference reveals inconsistent and weak effects. We argue below that the direct effects of *home-to-work interruption behaviors* on home-work interference may be suppressed by opposing (i.e., positive and negative) indirect effects through leisure-time detachment (positive indirect effect or mediator) and control (negative indirect effect or suppressor; see Cheung & Lau, 2008).

Relating back to our theoretical foundation, we expect home-to-work interruption behaviors to function slightly differently than the Wepfer et al. model generally predicts. Past research shows that time is a finite resource and that sacrificing time usually devoted to one domain can allow a person to "borrow" that time to devote it to more pressing needs in the other domain, to better manage interrole interference (Barnes et al., 2012). *Home-to-work interruption behaviors* may allow home-based

teleworkers to deal with personal concerns during work hours, potentially increasing time available for leisure and, consequently, feelings of control over leisure time. Conceptually, those who feel in control of their leisure time – because they have dealt with some personal concerns during work hours – may be better positioned to manage that domain’s overall negative interference with work (i.e., home-work interference). Indeed, occupational stress research reveals that control is a key resource that reduces strain outcomes (Karasek & Theorell, 1990), including direct influence on work-family outcomes (Butler et al., 2005). As a result, the positive direct relation expected between home-to-work interruption behaviors and home-work interference (H1) may be suppressed by a negative indirect relation through leisure-time control.

The expected indirect effect of home-to-work interruption behaviors on home-work interference through detachment, however, better aligns with Wepfer et al.’s model. Although home-to-work interruption behaviors do not directly infringe on leisure time, they may still undermine leisure-time detachment from work. More specifically, home-to-work interruption behaviors, like work-to-home interruption behaviors, create a muddled psychological borderland (Clark, 2000) wherein work and home thoughts, behaviors, and roles begin to overlap. Thus, home-to-work interruption behaviors may undercut psychological detachment needed to restore personal resources (Sonnetag, Binnewies, & Mojza, 2010) that can be used to manage the work and family domains (this time in the home-work direction; Nohe et al., 2014; Moreno-Jiménez et al., 2009).

In this way, home-to-work interruption behaviors may facilitate leisure-time control but reduce leisure-time detachment from work, with differing implications for work-home interference. We expect the indirect relation between home-to-work interruption behaviors and subsequent home-work interference to be mediated by leisure-time detachment (i.e., a positive indirect effect) but suppressed by leisure-time control (i.e., a negative indirect effect).

- *Hypothesis 3: The positive relation between home-to-work interruption behaviors and later home-work interference will be (a) mediated by leisure-time psychological detachment but (b) suppressed by leisure-time control.*

The “Whom”: Border Preferences as a Buffer

Finally, because different people can react differently to the same situation (Epstein & O’Brien, 1985), we examine an individual difference (i.e., border preference) as potential boundary conditions in our model, answering *for whom* the outlined effects play out as expected. In addition to differing on enacted border strategies (i.e., the actual level of permeation a teleworker experiences), people can differ in their *border preferences*. Just as enacted borders can be weak or strong, different people may have overarching preferences for integration (i.e., weaker, more blended borders) or segmentation (i.e., stronger, more distinct borders) across the work and home domains (Kreiner, 2006). In turn, it is not only the characteristics of the border itself that shape interrole interference but a person’s interpretation of those enacted characteristics based on their (mis)alignment with their desired border characteristics (Ammons, 2013).

While the direct effects of both enacted borders (Wepfer et al., 2017) and border preferences (Hahn & Dormann, 2013; Park et al., 2011) often point to segmentation as

beneficial for employees' work and non-work lives, the interactive effects between the enacted and preferred borders provide different expectations. Work-family research demonstrates that a congruence between border characteristics and preferences, not just strong borders, reduces interrole interference (e.g., Kreiner et al., 2009). Similarly, border theory emphasizes that border crossers are active participants in their own border creation and that effective border strategies (i.e., strong and segmented or weak and integrated) are not one-size-fits-all but, rather, depend on the person and their situation (Clark, 2000). Applied to the present study, stronger and more segmented borders (via few cross-role interruption behaviors) may not always be ideal for leisure-time experiences – and, in turn, interrole interference – if the worker prefers integration, as they will experience dissatisfaction and strain from the lack of congruence (Kulik et al., 1987). In total, we expect the negative relations between cross-role interruption behaviors and positive leisure experiences to be weaker for people who prefer integrated, rather than segmented, borders. Because aligned border enactment and preferences are theoretically expected to ameliorate negative effects, rather than facilitate positive effects, no moderating effect is hypothesized for the home-to-work interruption behavior/leisure-time control relation. The full conceptual model can be found in Fig. 1.

- *Hypothesis 4: The negative relation between (a)work-home interruptions and leisure-time control, (b)work-home interruptions and leisure-time psychological detachment, and (c)home-work interruptions and leisure-time detachment will be moderated by border preference (i.e., weaker for those who prefer integration compared to those who prefer segmentation).*

Method

To allow access to a large sample of home-based teleworkers, participants were recruited to participate in three waves of surveys via Amazon's Mechanical Turk (MTurk). We followed scholarly recommendations for improving MTurk data quality (Porter et al., 2019), such as selecting experienced and high-reputation MTurk participants, using attention checks, and spreading out recruitment during different times and days of the week. Wave 1 measured qualifications and demographic information (e.g., days worked from home, gender). Only adult participants working in the United States for at least 30 h per week on average, including working from home at least 1 day per week, were eligible to participate (M days worked from home per week = 2.66). When asked their primary reason for working from home, the most common response was family-related reasons (47.02%), compared to travel-related reasons (4.20%) and organizational requirements (8.8%). A substantial portion (39.1%) of our sample opted to provide a more specific reason for home-based teleworking, with many indicating that they prefer it due to better productivity, flexibility, and/or privacy. Participants who indicated that they were not employed by an organization with a central location (e.g., self-employed workers) or whose work consisted of completing MTurk tasks were not included in analyses. Wave 2 measured predictors (cross-role interruption behaviors), mediators (leisure experiences), and moderators (border preferences). Wave 3 measured outcomes (interrole interference).

Each wave was separated by a two-week lag to combat common method variance concerns for the predictor and outcome variables (Campbell & Fiske, 1959). The final sample, including only those who completed all surveys and accurately answered attention checks, consisted of 504 people (M age = 37.27 years; 71.6% white; 49% female; 67% had a bachelor's degree or higher). The analysis sample reflects a 44.2% retention rate from the first survey, not starkly dissimilar from the average retention rate in MTurk studies with two follow-up surveys (49.83% based on a reported 62.72% for the first follow-up and 79.45% for subsequent follow-ups; Keith et al., 2017). Participants reported a wide range of occupational fields, with the most common being computers/mathematics (21.27%), legal (16.10%), and sales (10.54%). Additionally, 57.53% of the sample was married, 50% had children (M = 1.83 children; M age of youngest child = 10.61 (SD = 9.21)). Of note, only 30.75% of the sample was both single and did not have children; we retained this group in our sample because single people who do not have children *do* still experience interrole interference (e.g., interference between work and home repair or work and parent caregiving) and scholars increasingly encourage their inclusion in work-family research (Bennett et al., 2017).

Measures

Cross-Role Interruption Behaviors In wave 2, the 10-item scale (α = .85) by Kossek et al. (2012) was used to assess both work-to-home interruption behaviors (e.g., “I allowed work to interrupt me when I spent time with my family or friends”, “I respond to work-related communications (e.g., emails, texts, and phone calls) during my personal time away from work”) and home-to-work interruption behaviors (e.g., “When I worked from home, I handled personal or family responsibilities during work time”, “I take care of personal or family needs during work”). Items were adapted to measure interruptions specifically experienced during home-based telework, rather than during non-telework working hours. Participants indicated their agreement with each item on a scale ranging from 1 (strongly disagree) to 5 (strongly agree) when reflecting on the previous 2 weeks. Although our model is at the between-person level, 2 weeks was chosen as a reference point for cross-role interruption behaviors and leisure experiences (see below) to combat recall biases likely to be exacerbated should participants have been asked to reflect on their general interruption and leisure experiences (see Conway & Pleydell-Pearce, 2000).

Positive Leisure Experiences In wave 2, two 4-item subscales from Sonnentag and Fritz's (2007) Recovery Experience Questionnaire were used to measure psychological detachment (e.g., “I distanced myself from work”; α = .90) and control (e.g., “I decided for myself how to spend my time; α = .89). Participants reflected on the previous 2 weeks of leisure time and indicated their agreement with each item on a scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Border Segmentation Preference In wave 2, Kreiner's (2006) four-item scale assessed border preferences (e.g., “I prefer to keep work life on work time”; α = .90). A higher score on this scale indicates greater preference for segmentation of work from home

and lesser preference for integration between the two. Participants indicated their overall agreement with each item on a scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Interrole Interference In wave 3, Grzywacz et al. (2006) three-item subscales assessed work-home interference (e.g., “Job or career kept you from spending the amount of time you would like to spend with your family; $\alpha=.90$) and home-work interference (“Home life kept you from spending the amount of time you would like to spend on job or career-related activities”; $\alpha = .91$). Of note, this scale captures more complete information about the home role (i.e., not solely limited to family) and demonstrates acceptable psychometric properties (see Min et al., 2019). Participants indicated the frequency with which each item occurred on a scale ranging from 1 (never) to 5 (five or more days per week) when thinking about the past 2 weeks.

Results

Prior to hypothesis testing, confirmatory factor analyses indicated good fit for the measurement model ($\chi^2(329) = 678.45, p < .001, CFI = .95, TLI = .96, RMSEA = .05$ (90% CI = .04, .05)) which loaded individual scale items onto each latent variable. Given some conceptual overlap between interruptions and interference, we also tested an adjusted model that grouped (a)work-to-home interruption behavior and work-home interference items together and (b)home-to-work interruption behavior and home-work interference items together. The measurement model demonstrated superior fit the adjusted model ($\chi^2(340) = 2561.03, p < .001, CFI = .73, TLI = .70, RMSEA = .11$ (90% CI = .11, .12)), supporting our study variables as quantitatively distinct constructs. Table 1 displays correlations and descriptive statistics. Given that the demographic factors were not strongly correlated with the core study variables in our data nor was there strong theoretical rationale for demographic control variables, we did not include any such variables as controls in our analyses¹. Hypotheses were evaluated using structural equation modeling in Mplus (Muthén & Muthén, 2017) with maximum likelihood estimation. We also used bootstrapping to test mediated effects per Cheung and Lau (2008). Significant moderation effects were explored further using the PROCESS macro in SPSS (Hayes, 2013).

Hypothesis 1 suggested a positive relation between cross-role interruption behaviors and interrole interference. Supporting this expectation, work-to-home interruption behaviors positively predicted WHI ($\beta = .25, p < .001$; H1a) and home-to-work interruption behaviors positively predicted HWI ($\beta = .13, p < .05$; H1b). Table 2 summarizes direct effects.

Hypothesis 2 predicted that detachment and control would mediate the positive relation between work-home interruptions and WHI. In support of H2a, work-to-home interruption behaviors significantly and indirectly predicted WHI through control ($\beta = .09, p < .001$) – though not through detachment (*ns*), counter to H2b. Hypothesis 3 predicted that the indirect relation between home-to-work interruption behaviors and interference would be mediated (i.e., positive) through detachment but suppressed (i.e., negative) through control. Counter to H3a, no mediation of home-work interruptions on

Table 1 Descriptive statistics and correlations

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Age	37.06	1.71											
2. Gender	1.49		.11										
3. Marital status			.10	-.07									
4. Children			.34	.08	.39								
5. Home-based telework days/work week	2.66	1.02	.08	.04	-.01	.06							
7. Work-to-home interruption behaviors	2.87	.85	-.05	-.08	.03	.03	.01						
6. Home-to-work interruption behaviors	3.57	.57	-.22	-.06	-.01	-.03	-.10						
8. Border preference	5.54	1.77	.04	.14	.07	.01	-.06	-.40	.07				
9. Leisure-time psychological detachment	3.28	1.24	.04	.00	.02	.00	-.04	-.52	-.03	.42			
10. Leisure-time control	4.11	.18	.14	.19	-.05	-.02	.05	-.24	.12	.26	.34		
11. Work-home interference	2.44	1.11	-.15	-.04	.02	.05	.01	.34	.04	-.05	-.29	-.30	
12. Home-work interference	1.83	.94	-.16	-.14	-.01	.10	.06	.31	.15	-.28	-.11	-.20	.45

$N = 504$. 0 = unmarried, 1 = married for marital status. 0 = male, 1 = female for gender. 0 = no, 1 = yes for children

HWI through detachment emerged (*ns*). However, in support of Hypothesis 3b, home-to-work interruption behaviors did demonstrate small, negative indirect effect on HWI through control ($\beta = -.03$, $p < .05$). Table 3 summarizes indirect effects for ease of interpretation.

Next, Hypothesis 4 suggested that border preferences would moderate three of the four proposed direct relations between cross-role interruption behaviors and leisure experiences. In support of H4a and H4b, border preferences did moderate the relation between work-to-home interruption behaviors and both detachment ($\beta = -.11$, $p <$

Table 2 Direct effects

Main effects	Detachment	Control	Work-Home interference	Home-Work interference
Work-to-home interruption behaviors	-0.71**	-0.26**	0.25**	(0.37**)
Home-to-work interruption behaviors	0.13*	0.17**	(0.05)	0.13*
Leisure-time detachment			-0.08	0.15**
Leisure-time control			-0.33**	-0.20**
R^2	0.36	0.14	0.19	0.21

* $p < .05$, ** $p < .001$. Effects in parentheses were examined post-hoc

Table 3 Indirect, interactive, and post-hoc effects

	Estimate
Indirect Effects	
Work-to-home interruption behaviors → Detachment → WHI	0.06
Work-to-home interruption behaviors → Control → WHI	0.09**
Home-to-work interruption behaviors → Detachment → HWI	0.02
Home-to-work interruption behaviors → Control → HWI	−0.03*
Interactive Effects	
Work-to-home interruption behaviors × Border Preference → Detachment	−0.11**
Work-to-home interruption behaviors × Border Preference → Control	−0.12**
Home-to-work interruption behaviors × Border Preference → Detachment	−0.06
Post-hoc Effects	
Work-to-home interruption behaviors → Detachment → HWI	−0.10*
Work-to-home interruption behaviors → Control → HWI	0.05*
Home-to-work interruption behaviors → Detachment → WHI	−0.01
Home-to-work interruption behaviors → Control → WHI	−0.06*
Home-to-work interruption behaviors × Border Preference → Control	−0.05

WHI Work-home interference, HWI Home-work interference

* $p < .05$, ** $p < .001$

.001) and control ($\beta = -.12$, $p < .001$). Probing these significant interaction effects further, people who prefer more integrated borders do not experience as extensive of a hit to detachment (simple slope = $-.27$, $p < .001$) from work-to-home interruption behaviors compared to people who prefer more segmented borders (simple slope = $-.51$, $p < .001$; see Fig. 2). Delving into the second significant interaction, the relation between work-to-home interruption behaviors and control does not significantly differ from zero for people who greatly prefer integration (simple slope = $.08$, $p = .27$),

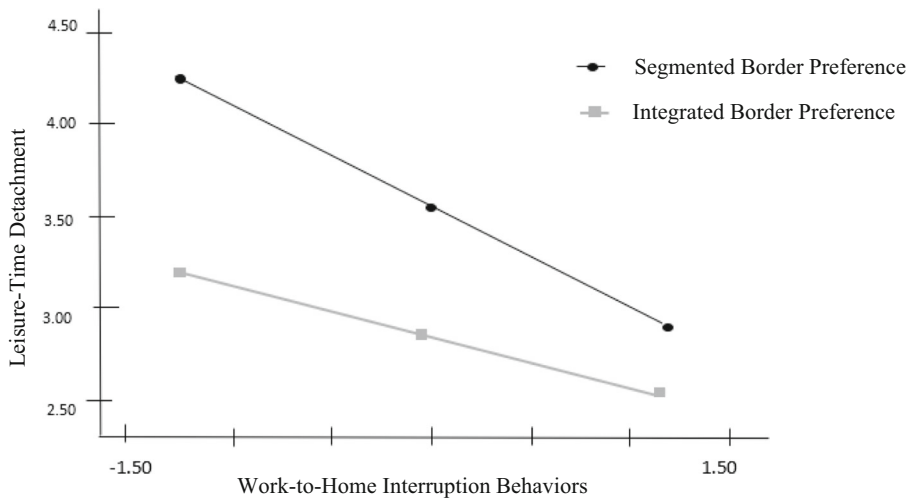


Fig. 2 Border preference a moderator of the relationship between work-to-home interruption behaviors (centered) and leisure-time psychological detachment from work. Note. Axes have been formatted to clearly depict the interactive effects rather than the entire range of the leisure recovery experience response scale

compared to the negative relation found for people who prefer segmentation (simple slope = $-.29, p < .001$; see Fig. 3). Finally, counter to H4c, no interaction effects were found between home-to-work interruption behaviors and border preference on detachment (*ns*). Interactive effects are summarized in Table 3 for ease of interpretation.

Post-hoc Findings

We examined two additional direct effects, four additional indirect effects, and one additional indirect effect post-hoc. First, cross-role interruption behaviors are generally expected to, and did, relate to interrole interference occurring in the same direction based on Williams and Alliger's (1994) model of interrole interference. However, it is also possible that cross-role interruption behaviors, no matter the direction, contribute to a blurred and integrated borderland wherein both directions of interrole interference are likely to occur (Clark, 2000). This proposition received partial support in our post-hoc analyses; work-to-home interruption behaviors positively predicted HWI ($\beta = .37, p < .001$), but home-to-work interruption behaviors did not predict WHI ($\beta = .05, ns$; see Table 1).

Building on the argument that both directions of cross-role interruption behaviors create a borderland that facilitates interrole interference, it is also possible that mediating effects by leisure experience occur between work-to-home interruption behaviors and HWI, on the one hand, and home-to-work interruption behaviors and WHI, on the other. Interestingly, the positive direct effect of work-to-home interruption behaviors on HWI seems to be mediated by control ($\beta = .05, p < .05$) but suppressed by detachment ($\beta = -.10, p < .001$; see Table 3). Conversely, despite lack of a significant direct relation between home-to-work interruption behaviors and WHI, there is a negative indirect relation (i.e., suppression) through control ($\beta = -.06, p < .05$),

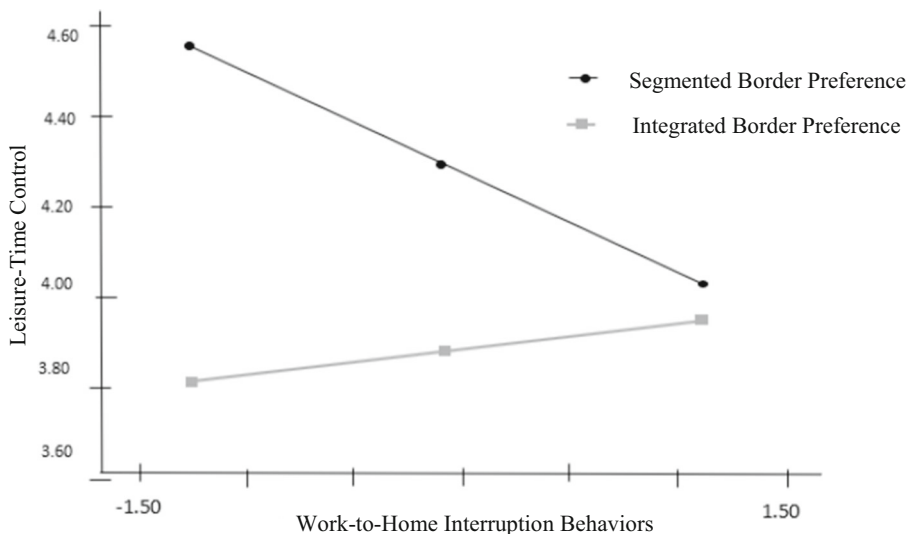


Fig. 3 Border preference as a moderator of the relationship between work-to-home interruption behaviors (*centered*) and leisure-time control. *Note.* Axes have been formatted to clearly depict the interactive effects rather than the entire range of the leisure recovery experience response scale

though no significant indirect effect through detachment was detected ($\beta = .01$, *ns*; see Table 3). Finally, border preferences were only expected to buffer negative relations between cross-role interruption behaviors – meaning they were not expected to moderate the relation between home-to-work interruption behaviors and leisure-time control. Indeed, no evidence of moderation was found (*ns*; see Table 3).

Discussion

Home-based telework arrangements are appealing to both employees and employers because they are seen as opportunities for employees to more flexibly – and potentially more successfully – navigate their work and non-work lives (Allen et al., 2015; Hartig et al., 2007). After all, working from home gives employees greater freedom to choose the timing, pace, and location of their work based on what is most satisfying and productive for them, in both work and nonwork domains (see Divol & Fleming, 2012). The weak to null relation between telework and work-home interference found by past research (Allen et al., 2013; Gajendran & Harrison, 2007; Mesmer-Magnus & Viswesvaran, 2006) is therefore disappointing given the underlying purpose of such work arrangements. The present study provides evidence for a theoretically driven explanation as to why home-based telework does not alleviate the burden of interrole interference.

First, home-based teleworkers manage their work and home lives in different ways; the extent of their work-home and home-work interference depends on the specific ways in which the two domains impede upon one another. Two experiences, work-to-home and home-to-work interruption behaviors, were examined as potential answers to the question of *what* aspects of work-life integration drive work-home interference in home-based teleworkers. In our data, work-to-home interruption behaviors consistently emerge as more detrimental than do home-to-work interruption behaviors. Both directions of interruptions predicted the corresponding direction of interrole interference, in line with expectations that life experiences culminate in interference perceptions specific to (i.e., in the same direction as) those experiences (Williams & Alliger, 1994). However, in our post-hoc analyses, work-to-home interruption behaviors predicted greater home-work interference in addition to the expected greater work-home interference. Home-to-work interruption behaviors did not significantly relate to the opposing direction of interrole interference (i.e., work-home interference).

Past research using a non-teleworker sample has similarly found that work-to-home permeability (including interruptions) relates to higher work-family conflict whereas home-to-work permeability does not. However, such findings may simply be a result of “matching” (Frone et al., 1992) or domain specificity (Frone et al., 1997), wherein conflict or interference originating in one domain most strongly relates to variables in that same domain. The present study considers directionality of both interruptions *and* interference to better test the possibility of “matching” causes and effects, especially given opposite findings that cross-domain effects are stronger than matching-domain effects (Amstad et al., 2011). Our results find both matching effects (i.e., work-to-home interruption behaviors with WHI, home-to-work interruption behaviors with HWI) and cross-domain effects (i.e., work-to-home interruption behaviors with HWI) and therefore do not exclusively endorse either perspective. In fact, work-to-home interruption

behaviors better predicted *both* directions of interference, indicating that something more complex than matching- and cross-domain effects are at play, at least when this issue is examined in a home-based telework context. Some work-family theories suggest that resource depletion is the key driver of interrole interference (e.g., Grandey & Cropanzano, 1999; ten Brummelhuis & Bakker, 2012). It may be that work-to-home interruption behaviors are more depleting than home-to-work interruption behaviors, explaining their stronger relation with both directions of interrole interference, not just the matching direction. There is some preliminary evidence for this argument in our data, as work-to-home interruption behaviors negatively predict leisure-time recovery (i.e., detachment and control) whereas home-to-work interruption behaviors demonstrate small positive relations with leisure-time recovery experiences.

Second, integrating one's work life and personal life in home-based telework arrangements does not have consistently valenced association with interrole interference. Such integration apparently has proximal costs *and* benefits for the leisure-time experiences, with contradictory effects for interference. Specifically, we found inconsistent mediation (i.e., both positive and negative effects) in some interruption/interference relations, through the leisure-time experiences of psychological detachment and control, which may suppress the overall relation (MacKinnon et al., 2000). We will begin with the one proximal benefit found because it best aligns with existing theoretical models (Wepfer et al., 2017). As expected, work-to-home interruption behaviors did relate to higher WHI (and, post hoc, HWI) through depleted leisure-time control. It seems possible that work-to-home interruption behaviors may be largely unwanted and therefore damaging for well-being and family outcomes in a home-based telework context.

We move now to proximal costs. As predicted, the direct, positive association between home-to-work interruption behaviors and HWI was suppressed by leisure-time control. Though not hypothesized, a similar indirect suppression effect emerged between home-to-work interruption behaviors and WHI through control. Home matters intruding into the work domain may foster interrole interference in general, but they also create a greater sense of control over leisure time which reduces interrole interference. For home-based teleworkers, including those in the present sample, being able to deal with personal concerns during work time is a key reason they are drawn to the arrangements in the first place. Home-to-work interruption behaviors may allow teleworkers to achieve this goal by “borrowing” time (Barnes et al., 2012) from work that can then be ceded to leisure, creating more freedom and control over leisure and, thus, reduced perceptions of interrole interference. An unexpected, post-hoc suppression effect was also found in the relation between work-to-home interruption behaviors and HWI through leisure-time detachment. This unexpected finding may be explained by research examining the ways in which family members notice and are affected by each other's work (Bolger et al., 1989; Westman, 2001). Perhaps work-to-home interruption behaviors and resulting low levels of psychological detachment signal to family members that the home-based teleworker is highly dedicated to their work, causing them to be more cautious when interrupting their work with family matters and leading to lower HWI.

Third, the proximal leisure effects that occur among home-based teleworkers when the work and home domains permeate one another does not manifest equally for all people, in line with Clark's (2000) description of work-life outcomes as a function of

both enacted and preferred borders. Indeed, the relation between work-to-home interruption behaviors and leisure experiences depends on border preferences. Teleworkers who prefer integration do not experience as strong of a decrement to leisure-time detachment when work interrupts the home domain. Further, for teleworkers who prefer integration, a slight positive relation was found between work-to-home interruption behaviors and leisure-time control though the relation was not significantly different from zero. These findings provide evidence that home-based teleworkers preferring integration are more resistant to the negative consequences of weak and permeable borders, rather than significantly benefitting from such borders simply because they prefer them. Of note, the lack of significant moderation of the relation between home-to-work interruption behaviors and leisure-time experiences may be a result of the scale used to measure work/home segmentation preference, as it captures a preference to separate work from home life but does not ask about preferences to separate home from work life. Given increasing acknowledgment that segmentation preferences are directional (Methot & LePine, 2016), it is certainly possible that a significant moderation would be found using a more detailed preference scale.

Theoretical Implications

The more detailed results summarized above also translate to several notable theory and research implications. For instance, our findings highlight and expand upon previous urgings to consider teleworkers as a heterogeneous group and focus research on detecting meaningful variation within teleworkers rather than simply comparing them to traditional workers (e.g., Allen et al., 2013, 2015). Home-based teleworkers do, by design, experience a heightened level of work-life integration, but the extent of integration still varies within this group and provides information about their leisure experiences and interrole interference. The current results also suggest it may be useful to examine replicability of existing work in a telework context but also carefully consider which findings may not carry over to such a setting. The negative indirect association of work-to-home interruption behaviors with HWI through detachment is a prime example of a finding that contradicts the existing theory and research when examined in a home-based teleworker sample.

Further, we elaborate upon a recent conceptual model (Wepfer et al., 2017) within the broader context of border theory (Clark, 2000). Border theory, alone, points to the effect border characteristics have on work-family outcomes. Wepfer et al.'s model adds that leisure-time recovery explains the psychological link between these two variables such that weak, permeable borders undermine leisure-time recovery and therefore reduce work-life balance and increase interrole interference. We contribute to growing evidence (e.g., Barber & Jenkins, 2014; Dettmers, 2017) largely supporting Wepfer et al.'s mediation model. Yet our findings also demonstrate that this general explanation is not watertight in a home-based telework context; rather, the specific type of interruption and leisure-time recovery experience examined matter. Counter to Wepfer et al.'s model, some work/home integration (i.e., home-to-work interruption behaviors) indirectly relate to lower interference by facilitating feelings of control over leisure time. Overall, leisure-time experiences still seem promising as a needed psychological mediator between border characteristics and interrole interference. However, the model could be modified so that both positive (i.e., mediating) and negative (i.e., suppressing)

indirect effects are possible through leisure-time experiences. Not only would this modification align with evidence from the present study but with border theory's (Clark, 2000) proposition that weak borders can be functional or dysfunction – and in this case, both functional and dysfunction in different ways.

Finally, the present study is rare in its examination of border characteristics (i.e., cross-role interruption behaviors as an indication of weak, permeable borders) and preferences at once (Hahn & Dormann, 2013; Wepfer et al., 2018). Relatedly, there has previously been very little in the way of specific theoretical investigation regarding the nature of effects when the interaction between the two is considered (i.e., does alignment mitigate negative consequences or actively foster beneficial ones?). Even the longstanding Person-Environment Fit theory (Caplan, 1987; French et al., 1974), which relatedly posits that perceived matching of one's personal characteristics and desires to their circumstances should reduce strain, concedes that the nature of the relationship between fit and strain is not well understood. The present study primarily provides evidence of integration preferences as a buffer in the integration/well-being relation rather than a factor that substantially reverses the valence of the relation. Even for home-based teleworkers who may have greater tolerance for work-life integration, an integration preference is only protective against integration for their well-being, not actively beneficial. It is possible, however, that active benefits may emerge in other work contexts or when considering other outcomes. To advance understanding of the role of border preferences, researchers should continue to attend to the specific nature of interactive influence with border enactment.

Practical Implications

Our findings are increasingly relevant as telework arrangements become more common. As shown in this study, work-to-home interruption behaviors impair home-based teleworkers' ability to adequately recover during leisure time, leading to greater interrole interference. To counter this problem, organizations can encourage social norms that limit after-hours technology use (Derks et al., 2015) by training supervisors to be role models who limit after-houremail/telephone communication and therefore unnecessary cross-role interruption behaviors. Organizations can also offer flextime arrangements, which would allow home-based teleworkers to schedule their work for times when unwanted work-to-home interruption behaviors are less likely. Teleworkers can also take steps to implement their own work-to-home borders. Although not feasible for everyone, maintaining strict time (e.g., only working from 9 to 5) and space (e.g., a designated office) borders might reduce likelihood of work-to-home interruption behaviors. Finally, organizations can provide training and interventions targeting these issues. Health circles, for instance, teach strategies for coping with time management and communication stressors associated with telework (Konradt et al., 2000).

Finally, organizations might benefit from considering differences in border segmentation preference when selecting and managing teleworkers. The results of this study show that teleworkers who prefer integration are not affected as negatively by work-to-home interruption behaviors, though they are not immune to their harmful effects. Omari and Standen (2000) discuss a selection-oriented approach to telework, identifying traits, motivations, competencies, and previous records of

performance that can promote success in a telework role. Border integration could be added to this approach when assigning telework arrangements. However, Omari and Standen (2000) also note that a selection-oriented approach alone is likely insufficient. If home-based telework is necessary but not preferred for a substantial number of employees, the organizational norm and policy changes recommended earlier may be of even greater value. A comprehensive approach that attends to selection, job design, and the physical and psychosocial work environment for teleworkers is recommended in practice.

Limitations and Future Research Directions

The present study uses self-report measures, which increase the risk of common method variance (CMV; Spector, 2006). However, self-report may be the best choice for many of the present constructs (i.e., leisure experiences, interference) given that employees themselves likely have the most accurate information about these variables. Although variables were collected at different time points to mitigate some CMV concerns, we did not use a true longitudinal design for this study. Our conclusions about interruptions, recovery, and interference are supported by theory, but without longitudinal evidence, reverse causality is possible. It might be existing interference causes greater susceptibility to interruptions, which then negatively affect leisure. Future longitudinal studies would provide more confidence in causal relations among these variables.

The use of an MTurk sample may also be a concern. It is difficult to ensure that the sample consists solely of teleworkers. However, a separate screener with distractor items was used to identify teleworkers for this study. We also followed recommended practices for mitigating some of the issues commonly associated with MTurk samples (Porter et al., 2019). Due to the sample size needed for this study, recruiting an organizational sample of teleworkers large enough from just one or two organizations poses a challenge. Additionally, an organizational sample may not provide enough variation in interruptions to observe the relations of interest due to similarities in telework policies and climate within an organization.

Lastly, our study examines cross-role interruption behaviors as a static variable, but realistically, cross-role interruption behaviors and reactions to them vary across situations. Conducting qualitative research could provide more detailed insight into how home-based teleworkers navigate their work arrangements and help identify potential solutions to some of the challenges identified here. Experience sampling designs could also be used to parse out within-person effects related to specific interruptions rather than a person's general experience of interruptions. Both qualitative and experience sampling research could collect more detailed information about the content and sources (e.g., spouse versus child) of cross-role interruption behaviors given that meaningful variation is likely to exist in these experiences and their effects. Research along these lines could also test the possibility that certain types of interruptions (based on direction, content, course) are more depleting than others and thus result in greater interference regardless of domain, based in work-life resource models (e.g., ten Brummelhuis & Bakker, 2012) and as suggested earlier. Finally, though psychological detachment and control are traditionally measured as leisure experiences (Sonnentag & Fritz, 2007), it may be equally useful to measure detachment from personal life during work and control over work time, as these mechanisms may be central in understanding

home-work interference. Overall, initial support for the present model can serve as a foundation for more detailed research on the nature and consequences of border permeability for home-based teleworkers.

Conclusion

The present study is a nuanced examination of home-based teleworkers' experiences of interference between work and home domains. Allowing work to interrupt home life may more consistently create interference for this group than does allowing home life to interrupt work. Control over leisure time and psychological detachment from work during leisure time mediate these relations, though both suppression and traditional mediation effects were found. Further, work/home segmentation preference was supported as a moderator, suggesting that a preference to integrate work and home lives may protect against potential negative consequences of working and living in the same place. These mixed and moderated nature of these findings may help explain why previous literature has been inconclusive regarding how working from home impacts work-family and well-being outcomes. Our findings also add detail and context to work-family theory and provide insight into effective management of the growing teleworker workforce.

Code Availability The authors did not plan to make the code publicly available.

Authors' Contributions Claire Smith – Conception, research design, data acquisition, data analysis, writing, editing; Susannah Huang – Conception, research design, data acquisition, writing, editing; Kristin Horan – Data interpretation, writing, editing; Clare Barratt – Conception, research design, editing.

Data Availability The authors did not plan to make the data publicly available.

Declarations

Conflicts of Interest/Competing Interests None to disclose.

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