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MAJOR EMPIRICAL CONTRIBUTION

The Impact of Telework on Conflict between Work and Family: A Meta-Analytic Investigation

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Abstract

There is a common assumption that the use of telework is beneficial for managing one's work and non-work roles due to perceptions of increased flexibility while teleworking. In this meta-analysis we investigate the relationship between telework and bi-directional indicators of work-family conflict, such as work interference with family (WIF) and family interference with work (FIW). We also test whether gender and continuous versus dichotomous measurement of telework (e.g., proportion of working hours spent teleworking versus groups of teleworkers and non-teleworkers) moderate these relationships. Following Schmidt and Hunter's (2015) random-effects method, we find telework to be associated with significantly lower levels of WIF and not significantly related to FIW. Additionally, gender and measurement of telework both moderate the relationship between telework and WIF. Our findings speak to the nuanced relationship between telework and work-family conflict.

Keywords Telework · Work-family conflict · Meta-analysis · Gender · Extent of telework

Telework is defined as working outside of one's central organization, such as within one's home, while using information and communications technology (ICT) to

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conduct the essential functions of one's job (Allen et al., 2015b). With the onset of the COVID-19 pandemic, the turn of the decade coincided with an acute uptick in the utilization of telework. As early as March 2020, approximately 5 million United States (US) employees were actively working from home at least half-time, and 43% of employees were engaged in remote work in some capacity (Global Workplace Analytics, 2020a). Quickly, job roles previously presumed to be physically bound to the organizational setting were transitioned to being performed within one's home and in the presence of family. Given the likelihood of telework remaining a staple work arrangement among organizations (Global Workplace Analytics, 2020b), scientists and practitioners are hastening to understand the impact telework is likely to have on worker health and well-being.

Empirical interest regarding the impact of telework on workplace phenomena and individual experience extends to before the turn of the century (Bailey & Kurland, 2002). One domain of particular interest has been the intersection of utilizing the option to telework and balancing one's work and non-work roles (i.e., work-family conflict). Prior authors have assumed telework to be a beneficial mechanism for managing these domains due to its potential for increased flexibility (Gajendran & Harrison, 2007). However, work-family research within the context of telework has provided a wide-range of varying results (Beckel & Fisher, 2022). One approach to explaining the relationship between telework and work-family outcomes is the expectation that telework should reduce work-family conflict (WFC) due to reductions in commuting time and increased perceptions of flexibility in one's work schedule and location (Allen et al., 2015b). Others propose telework disintegrates the spatial boundaries between one's work and home domains and therefore increases the likelihood for work to spillover to one's family domain, and vice versa (Mann et al., 2000). Further, there is a vast and varied literature on individual and organizational factors which may increase the likelihood of experiencing WFC within the teleworking context (Golden, 2006; Kossek et al., 2006), as well as conceptual barriers which muddy the extent to which we can generalize these outcomes within the telework literature (Beckel & Fisher, 2022).

Objective

In the current article, we attempt to consolidate the varied perspectives and empirical evidence on the relationship between telework and WFC through meta-analytic investigation. Per the authors' knowledge, there have only been two meta-analyses examining the empirical relationship between telework and work-family conflict. First, Gajendran and Harrison evaluated the role of work-family conflict as a psychological mediator in the relationship between telework and work-related well-being. Their findings demonstrated that telework is beneficial for mitigating work-family conflict, with further implications for employee job satisfaction, turnover intentions, and role-stress. Additionally, Allen et al., (2013) evaluated the relationship between various flexible work arrangements and work-family conflict, including flexplace arrangements akin to telework, finding similar, though weakened effects.

Nonetheless, there has been substantial growth in both empirical interest in, as well as the actual utilization of, employee telework (i.e., approximately 159% since 2005; Global Workplace analytics, 2020a) since these authors' investigations. Further, there has yet to be a targeted and telework-specific meta-analysis to advance the field's understanding of the relationship between remote work and work-family conflict. To address this gap, we aim to gather and analyze the relationship between telework and work-family conflict through a strict conceptualization of both telework and work-family conflict as we know it to be today. In addition, we incorporate a number of modern studies including studies conducted during the COVID-19 pandemic.

Beyond these points, we argue that a targeted meta-analysis, as we have conducted, affords several advantages. Despite focusing on a relatively small number of studies compared to prior work in this area (e.g., Gajendran & Harrison, 2007), the number of studies we have analyzed ($k = 29$) exceeds the average number of studies ($k = 19$) found by Aguinis et al.'s (2011) analysis of 192 meta-analyses. Further, a meta-analysis like ours can still move a field forward as exemplified by recent influential meta-analyses with a similar number of analyzed studies (e.g., Allen et al., 2004; Riketta, 2008). With this scope, we focus specifically on telework but also distinguish family-to-work conflict from work-to-family conflict, a distinction only initially addressed by Gajendran and Harrison (2007), despite important differences in these constructs (Greenhaus & Beutell, 1985). Further, rather than only reviewing the empirical literature related to telework and work-family conflict, we support the notion put forth by DeSimone et al., (2019) that meta-analysis can reveal moderators of a relationship that future researchers should be mindful of but also guide investigation to conditions where effect size heterogeneity remains large. A related benefit is that we believe our investigation provides future scholars interested in this area more information for study planning as a priori power analysis can produce dramatic underestimates of power when effect size heterogeneity is not considered (Kenny & Judd, 2019). These benefits are substantial given the increased interest in teleworking resulting from the COVID-19 pandemic (Parker et al., 2022).

Gajendran and Harrison, (2007) conclude their meta-analysis of telework stating that, "Telecommuting has a clear upside: small but favorable effects on … work-family conflict …" (p. 1538). This unambiguous sentiment is likely what most would discern but has recently been challenged in a narrative review by Beckel and Fisher, (2022); wherein, their evaluation of the literature suggests the relationship between telework and work-family conflict outcomes is largely equivocal. Though the work of Beckel and Fisher, (2022) certainly advances study of telework and health, meta-analysis provides many advantages over narrative reviews in the quantitative summary of a literature (Hunter & Schmidt, 2015). Here, we address the equivocality mentioned by Beckel and Fisher, (2022) and contribute to the literature through further clarifying the relationship between telework and a bi-directional conceptualization of WFC, identifying moderators which guide these relationships, and highlighting the existence of effect size heterogeneity. In doing so, we hope to inform organizations designing and implementing telework policies as well as guide research in this important domain.

Conceptualizing Telework

The varied terms used to refer to telework, such as *telecommuting*, *remote work*, *flexible work*, and *virtual work,* each carry their own definition within the literature. Early reference to telework, originally cited as *telecommuting* (Nilles, 1975), referred to the utilization of ICT to perform work versus commuting to, and attending the conventional office setting (Blount, 2019). With advances in ICT and organizational structure, such as the development of remote centers and distributed workers, telework definitions have continued to evolve.

Subsequently, the inability of the field to come to a conclusive definition of telework across literatures has also led to an inability to generalize findings across telework studies. Alterations to the context and location in which telework is performed across studies have contributed to ambiguous conceptualizations of telework and discrepancies in how telework is historically measured. For instance, early teleworking studies traditionally investigated group differences in work-related outcomes through dichotomous measurement of teleworking versus non-teleworking employees (Allen et al., 2015b). Meanwhile, contemporary studies have begun to incorporate measurement of the extent of telework, a continuous measure calculated as a proportion of one's total working hours spent teleworking (Golden & Veiga, 2005), to better understand the relationship between telework and work outcomes. In this meta-analysis, we aim to further contribute to the literature by investigating whether the varying conceptualizations of telework (i.e., dichotomized versus continuous) alters what we know about the relationship between teleworking and work-family conflict.

In doing so, we refer to Allen et al.'s (2015b) definition wherein telework is a work practice involving members of an organization performing a subset of their work hours away from their central workplace, most often from home, and which includes the use of ICT to interact with others and perform job tasks. Accordingly, we use this definition to set criteria for article inclusion for analyses.

The Impact of Telework on Work-Family Conflict

Work-family conflict occurs when pressures to perform within one's work conflict with those from one's family domain (Greenhaus & Beutell, 1985). Allen et al., (2015a) note work-family conflict typically serves as an "umbrella term" encompassing two directionally distinct phenomena (p. 46): work-to-family (WIF) conflict, which refers to work roles interfering with family roles, and family-to-work (FIW) conflict, which refers to family roles interfering with work roles (Greenhaus & Beutell, 1985). Prior research indicates mixed results regarding the relationship between telework and both WIF and FIW. For example, Golden et al., (2006) found telework to be associated with reduced WIF, such that as an individual spends more time teleworking (i.e., versus working from their physical organization) they also report less interference by their work within their family or nonwork domains. Conversely, Redman et al.,

(2009) found no such relationship. Similarly, Golden et al., (2006) found teleworking to be positively associated with FIW, supporting the assumption that the introduction of work into one's home may perpetuate interruptions or distractions by one's family or nonwork domains. Again, Redman et al., (2009) found telework to be negatively associated with FIW.

Prior Meta-Analyses

Prior meta-analyses bring synthesis to the seemingly equivocal relationship between telework and work-family conflict. First, Gajendran and Harrison, (2007) report a small, beneficial (d = -0.23) relationship between telework and WFC (conceptualized as a low level of work interference with family and high-levels of work-family balance); wherein, teleworking was negatively associated with both WIF ($\hat{p}$ = -0.16) and FIW ($\hat{p}$ = -0.15). Second, when meta-analytically investigating the relationship between various flexible work arrangements and WFC, Allen et al. (2013) reported a trivial, though significant, relationship between flexplace use (i.e., flexibility in one's work location) and WIF ($r = -0.08$) and a non-significant association between flexplace use and FIW (r = -0.01). Thus, despite some concerns that telework may collapse boundaries between work and home domains and potentially increase WFC (Mann et al., 2000; Standen et al., 1999), it is plausible that telework instead reduces WFC by providing greater flexibility to employees as they juggle work and family roles (Raghuram and Wiesenfeld, 2004).

Given these findings we hypothesize:

Hypothesis 1a: Telework will be associated with reduced work-to-family conflict.
Hypothesis 1b: Telework will be associated with reduced family-to-work conflict.

The Moderating Roles of Gender and Measurement

As discussed, equivocal results from numerous telework and work-family studies have prevented the field from reaching a consensus in determining the circumstances in which telework is beneficial for balancing one's work and home domains. However, both meta-analyses by Gajendran and Harrison, (2007) and Allen et al., (2013) found substantial heterogeneity in the relationship between telework and WFC across studies included in their analyses, indicating a high likelihood of moderators. Considering these findings, we propose the differing evidence within the telework and work/family literature may be the result of individual and contextual differences, as well as an extension of the varied conceptualization and measurement of telework across studies. Accordingly, we first put forward gender as an individual difference central to the work-family literature likely to influence the degree to which one experiences work-family conflict upon teleworking. Following, we evaluate the moderating role of telework measurement and propose differing evidence across studies may be a result of dichotomous versus continuous measurement of telework.

Gender

As mentioned previously, meta-analytic work by Gajendran and Harrison, (2007) suggested that telework had a beneficial influence on both WIF and FIW. This benefit was operationalized as a negative effect size (i.e., increased telework was associated with decreased conflict). We argue that this benefit may not be homogenous across all individuals. Specifically, we argue that benefit, i.e., the magnitude of the negative effect size, will be weaker among women who may experience mixed changes to the conflicts they experience because of teleworking.

First, prior work suggests that the utilization of telework is gender-balanced (Bailey & Kurland, 2002; Global Workplace Analytics, 2022). Instead, studies reflect differential reasons for, and outcomes of, teleworking by gender. Past literatures report women to be more likely to telework for reasons of childcare, while men have reported utilizing telework options to avoid workplace distractions (Olson & Primps, 1984). For instance, in a series of interviews, six of eight women considered childcare one of the main reasons for teleworking compared to only one out of five males (Sullivan & Lewis, 2001). These reports are compounded by the likelihood for women to assume multiple roles, such as the role of caregiver and employee while working within the home, which often present competing demands (Mann & Holdsworth, 2003). For example, during the COVID-19 pandemic, 36% of dual-earning heterosexual couples reported maintaining historical gender norms in how they delegated work and family roles; wherein, women assumed sole responsibility for childcare when teleworking without adjustments to their spouses work schedule or location (Shockley et al., 2021). In addition, mothers who were mandated to work from home during COVID-19 reported higher frequencies of anxiety, loneliness, and depression than fathers who were also mandated to telework (Lyttelton et al., 2020). Despite both parental figures being present and working at home, mothers were also found to spend on average an hour more each day with their children as compared to fathers.

Further, in qualitative accounts women have detailed greater experiences of disruptions by neighbors or friends when teleworking, deeming others did not perceive them as truly working when removed from the physical boundaries of the office (Mann & Holdsworth, 2003). Conversely, men did not indicate these frustrations, and have been shown to report decreased levels of overall stress when working from home (Olson & Primps, 1984). Thus, especially for women, frequent interruptions while teleworking may result in multiple roles becoming permeable (i.e., worker, caregiver, partner, etc.), both physically and psychologically, blurring the boundaries between competing roles during work hours and elevating experiences of work-family conflict (Zhang et al., 2020).

Finally, there may exist differences in identity centrality regarding how women, versus men, have historically assumed the role of caretaker when teleworking (Olson & Primps, 1984; Thompson et al., 2021). Identity centrality emphasizes the importance of personal identities and how those identities may interfere with each other when being evoked simultaneously, resulting in conflict (Settles, 2004). If choosing to telework in order to care for children or other dependents in the home, women may be more likely to intentionally attend to their role of caretaker alongside

teleworker. Thus, teleworking on its own may not increase the family or nonwork responsibilities assumed by a worker, but the historical division of family and home responsibilities across genders may put women at an increased likelihood of experiencing work-family conflict when teleworking. Specifically, women who are assumed to be responsible for childcare or household activities may more strongly perceive working from home as a disruption to their family or nonwork domains (Žiedelis et al., 2023). Further, historical gender norms related to whom assumes responsibility for childcare or "housework" may increase the likelihood of familial others in the home interrupting female teleworkers during their working hours over their male counterparts (Chung & van der Horst, 2020; Chung et al., 2021). This suggests that those who assume the identity of caretaker may be more likely to experience conflict alongside the benefits of telework and that women are more likely to assume this caretaker identify.

As mentioned more generally, telework is thought to reduce conflict through providing the ability to juggle competing demands between work and family (Raghuram & Wiesenfeld, 2004). However, as demonstrated by the literature invoking gender, what those demands are and how well they can be juggled may vary substantially (e.g., Olsen & Primps, 1984; Shockley et al., 2021). Further, though women constitute a demographic category within which there is substantial variation, extant research shows that women are more likely than men to bear responsibilities that are more challenging to address via telework (Duxbury & Higgins, 1991; Shockley et al., 2021). Duxbury and Higgins (1991)'s work helps explain how these aforementioned gender differences come about. They demonstrate how men and women are becoming similarly involved in work, yet family involvement and family expectations are higher among women. This high emphasis on family responsibilities among women has remained since Duxbury and Higgin's, (1991) work as shown by Shockley et al., (2021). Given these differences, we anticipate a relatively weaker benefit of telework for women as compared to men, leading us to propose the following hypothesis:

> **Hypothesis 2**: Gender will moderate the negative (i.e., beneficial) relationship between telework and WFC such that this relationship will be attenuated (i.e., of reduced benefit) among primarily female samples.

Telework Measurement

Within the literature, telework operationalization is often inconsistent due to telework being measured on both a continuous scale (Jostell & Hemlin, 2018) and dichotomously (Clarke et al., 2017). Moreover, different forms of measurement of telework may lead to greater difficulty in interpreting the relationship between telework and WFC, particularly due to the loss of information that occurs through dichotomous measurement (Altman & Royston, 2006). As an example, Hornung and Glaser, (2009) measured telework continuously and found the relationship between telework and WIF had an effect size of $r = -0.2$. Yet, when utilizing the same measure of WFC (Netemeyer et al., 1996), but a dichotomous conceptualization of telework,

Breaugh and Frye, (2008) found the relationship between telework and WIF had an effect size of r = -0.01. We therefore wanted to test whether the relationship between telework and WFC variables may be moderated by how telework is conceptualized and measured across studies.

Further, telework is not an all-or-nothing behavior. It is a behavior that employees may engage in variably. For example, extent of telework (EOT) refers to the amount of time one spends teleworking as a proportion of their total working hours (Golden & Veiga, 2005), and is an increasingly common continuous measure of telework among the literature (Beckel & Fisher, 2022). Thus, we examine whether dichotomous versus continuous measurement of telework influences the relationship between telework and WFC variables, as we argue the dichotomization of telework is a theoretical misspecification.

Along these lines, there is ample evidence suggesting the relationship between telework and WFC variables may vary as a result of the extent of telework. For example, prior research depicts meaningful differences between the amount of time spent teleworking and job satisfaction (Golden & Veiga, 2005; Virick et al., 2010), quality of relationships with supervisors and coworkers (Gajendran & Harrison, 2007), perceived stress and exhaustion (Gajendran & Harrison, 2007; Sardeshmukh et al., 2012), and even work-family conflict (Gajendran & Harrison, 2007). More distinctly, such research demonstrates a curvilinear relationship between telework and job satisfaction; wherein individuals teleworking 40% of their total working hours reported the greatest levels of job satisfaction versus those teleworking more or less frequently (Golden & Veiga, 2005). Given research will likely continue to investigate whether relationships between telework and WFC variables are non-linear, it is especially important to assess whether the measurement of telework may influence relationships between telework and WFC variables.

Given these important distinctions, we predict:

Hypothesis 3: Measurement type will moderate the relationship between telework and WFC such that studies utilizing continuous measures of telework, relative to dichotomous measures, will report a stronger negative relationship between telework and WIF.

Method

Gathering Literature and Eligibility Criteria

We began our literature search by establishing keywords. Per recommendations by Bosco et al., (2020), we collected relevant search terms via MetaBus as well as several recent reviews and meta-analyses of telework and WFC (Allen et al., 2013; Gajendran & Harrison, 2007). The resulting keywords for telework included *telework*, *telecommuting*, *virtual work*, *remote work*, *mobile-work*, *virtual workplace*, *virtual organization*, *distributed work*, *work at home*, *flexplace*, and *flexible work arrangements*. The keywords collected for WFC included, *work-life*, *work-life balance*, *work-life conflict*, *work-life spillover*, *work-life interference*, *work-nonwork*,

work-nonwork balance, *work-nonwork conflict*, *work-nonwork interference, work-nonwork spillover*, *work-family conflict*, *work-family balance*, *work-family interference*, and *work-family spillover*.

We conducted a Boolean literature search such that at least one keyword for each construct was present in a retrieved article. The databases we utilized included MetaBus, Web of Science, and PsycInfo. For unpublished work, we searched ProQuest as well as requested effect sizes from the Society for Occupational Health Psychology listserv. We sought to review studies disseminated as recently as 2023. We compared the studies we found via literature search to those meta-analyzed by Gajendran and Harrison, (2007) to yield three additional studies.[1] We also retrieved one study via posting to an occupational health psychology listserv. In total, our search yielded 942 articles, which we initially screened for containing a measure of both telework and WFC, as well as an effect size that related the two and was suitable for meta-analysis. We chose to include relevant articles in which telework was conceptualized as working in a remote capacity, principally from home, and away from a workers' physical organization. Additionally, selected articles were to have at least one directionally distinguishable measure of WIF or FIW; those measuring WFC in the general sense were excluded. After this screening process, we retained 29 studies yielding $k = 29$ effect sizes for further coding and inclusion in our meta-analysis.

Prior to evaluating hypothesized effects, we sought to evaluate the potential for publication bias. However, given the small number of unpublished works ($n = 5$) we were able to obtain, we were unable to test this difference across both WIF and FIW. We obtained a sufficient number of effect sizes to evaluate publication status as a moderator for the relationship between telework and WIF. Published studies ultimately yielded a significant negative effect ($\rho = -0.09$, $k = 24$, $N = 32{,}376$, 95% $CI = [-0.14, -0.04]$, 80% $CV = [-0.24, 0.06]$, $SD\rho = 0.11$) whereas unpublished studies yielded a nonsignificant effect ($\rho = -0.04$, $k = 5$, $N = 1{,}907$, 95% $CI = [-0.17$ to $0.08]$, 80% $CV = [-0.17, 0.09]$, $SD\rho = 0.09$). However, the difference in statistical significance is largely attributable to the difference in sample size across published and unpublished studies. The effect sizes among published and unpublished studies are relatively similar and would not be statistically significantly different from each other (given one effect size would be included in the other's confidence interval). Considering these results and acknowledging the shortcoming of insufficient studies to evaluate publication bias with respect to FIW, we did not find evidence for publication status impacting the observed relationship between telework and WFC.

Final Sample and Coding

All studies were reviewed by two of the study authors. Kappa indicated high agreement ($k > 0.80$) for most variables, however, in all instances of initial disagreement a satisfactory agreement was reached via discussion. See Table 1 for

[1] Studies that overlap with Gajendran and Harrison (2007) are specified in Table 2.

Table 1 Interrater Reliability Estimates for Study Variable Coding

Variable	N	*k*
Sample size	29	.96
WIF Effect Size	29	.93
FIW Effect Size	10	.86
WIF Reliability	16	.77
FIW Reliability	8	.79
% Female	19	.84
Measurement Type	10	.93

WIF = Work interfering with family. *FIW* = Family interfering with work. *k* = Kappa

initial Kappa estimates. We provide information about our collection of each data point in the following sections. Readers may find information relating to studies included for analyses in Table 2. Regarding both tables, values are reported when the cited articles included information needed for coding (i.e., coefficient alpha).

Telework

Based on our conceptualization of telework, we outlined several criteria for retaining measures of telework in our meta-analysis. Per our criteria, we retained articles in which the measure of telework 1) identified individuals who utilized telework as defined by our conceptual definition (i.e., teleworkers versus non-teleworkers) or 2) measured the intensity or extent to which a participant teleworked (e.g., number of days, hours, or proportion of time spent teleworking). Based on this conceptualization, we also included both categorical measures of telework whereby teleworkers were compared to non-teleworkers, as well as continuous measures of telework.

Work-Family Conflict

Despite the scope of keywords use in our literature search, we sought to specifically analyze directional measures of WFC (i.e., work interfering with family and family interfering with work). Further, we maintained the distinction between these criterion variables throughout all analyses to better evaluate the unique relationship telework has with each criterion variable. Among the obtained articles, specific directional measures that met this goal used conventional labels (or synonyms). Thus, we included effect sizes representing directional measures of WFC that followed widely accepted definitions of these constructs.

Table 2 Characteristics and Measures of Studies Included in Meta-Analyses

Study	N	% FEM	TW	WFC MEASURE	WIF *r*	WIF *α*	FIW *r*	FIW *α*
Allgood et al., (2022)	124	50.8	1	Netemeyer et al., (1996)	.03	.91		
Alexander, (2014)	1,046	38	0	O'Driscoll et al., (1992)	-.05	.87		
Breaugh and Frye, (2008)	211	-	1	Netemeyer et al., (1996)	-.01	.93		
Clarke et al., (2017)	229	60	1	Grzywacz and Marks, (2000)	.08	.73	.12	.72
Fonner and Roloff, (2010)	192	56	1	Hill et al., (2003)	-.26	.87		
Golden, (2006)[a]	294	47	0	Carlson et al., (2000)	-.05	.84		
Golden et al., (2006)[a]	454	35	0	Carlson et al., (2000)	-.27	.85	.15	.81
Griffiths, (2003)[a]	120	83.3	1	Howland, (1998)	-.05	.93	-.02	.85
Heiden et al., (2021)	392	69	0	Berthelsen et al., (2014)	.52	.89		
Hill et al., (2010)	24,436	48	1	N/A	-.10			
Hornung et al., (2008)	887	25	1	Netemeyer et al., (1996)	-.29			
Hornung and Glaser, (2009)	1,008	28	0	Netemeyer et al., (1996)	-.20	.92		
Jostell and Hemlin, (2018)	71	35	0	Gutek et al., (1991)	.25	.83	.04	.74
Kelly-Bellamy, (2015)	115	66	0	Fisher et al., (2009)	.01		-.07	
Kossek et al., (2006)[a]	245	57	0	Gutek et al., (1991)	-.11	.73	-.05	.71
Lapierre et al., (2016)	251	-	0	Carlson et al., (2000)	.17			
Lautsch et al., (2009)	90	59	1	Gutek et al., (1991)	-.04	.73	.06	.71
Leung and Zhang, (2017)	509	53	0	Dilworth, (2004)	.19	.72	.11	.75
Li et al., (2022)	590	46.9	0	Carlson et al., (2000)	.06	.93		
Madsen, (2006)[a]	221	57.9	1	Carlson et al., (2000)	-.21	.89	-.19	.85
McCarthy, (2001)[a]	74	39.2	1	Kelloway, (1999)	.04	.87	-.04	.77
Mills and Grotto, (2017)	133	18	1	N/A	.11	.83		
Raghuram and Wiesenfeld, (2004)[a]	756	67	0	O'Driscoll et al., (1992)	-.18	.88	-.10	.76
Schall, (2019)	185	61	0	Netemeyer et al., (1996)	-.25	.95		

Table 2 (continued)

Study	N	% FEM	TW	WFC MEASURE	WIF *r*	WIF *α*	FIW *r*	FIW *α*
Smith et al., (2021)	504	49	0	Grzywacz et al., (2006)	.01		.06	
Solís, (2016)	142	-	0	Gutek et al., (1991)	.14		.18	
Solís, (2017)	164	50	1	Gutek et al., (1991)	.05	.83	-.07	.76
Spilker (2014)	441	55	-	Fisher et al., (2009)	.07			
Xu et al., (2022)	399	62.4	0	Grandey et al., (2005)	.17	.93	.29	.92

Measurement of telework denoted as TW (1 = telework measured dichotomously, 0 = telework measured continuously). *WFC* refers to work-family conflict. *WIF* = Work Interfering with Family Conflict, *FIW* = Family Interfering with Work Conflict. Observed correlation from primary study presented under the column *r*. Solis, (2017) reported a 50% female sample, this study was excluded from moderator analyses. Obtained estimate of WFC measure reliability denoted under column *α*. Studies with [a] denote studies included in the meta-analysis by Gajendran and Harrison, (2007)

Moderators

Gender First, we recorded the percentage of each sample that was female and used that proportion to evaluate gender as a moderator. However, we were unable to assess gender as a continuous moderator via meta-regression due to the number of effect sizes we were able to obtain. Meta-regression requires a greater number of observed effect sizes to be adequately powered as compared to categorical tests of moderation (Cafri et al., 2010; Hunter & Schmidt, 2015). As a result, we coded each majority-female sample (e.g., percentage female greater than 50%[2]) as 1 and majority-male samples as 0.

Telework measurement Given the variety of methods for assessing telework we sought to assess the impact measurement approach had on the observed relationship between telework and WFC. The two authors who coded the retained studies evaluated the variety of measurement approaches for a feasible categorization scheme given our meta-analytic approach and also our desire to have sufficient sample sizes for each level of a moderator. As a result, we coded measurement approaches as either continuous or dichotomous (i.e., teleworkers vs. office workers) to evaluate the impact of measurement approach on meta-analytic effect size estimates.

We also assessed whether gender and telework measurement coding yielded meaningfully unique codes of the effect sizes included in our meta-analysis. Agreement between codes was low ($\kappa = 0.08$, $p < 0.05$), suggesting our moderators represented unique categorizations of the studied effects.

Meta-Analytical Approach and Analyses

We followed Schmidt and Hunter's (2015) approach of psychometric meta-analysis, using Dahlke and Wiernik, (2019) *psychmeta* package in R (R Core Team). Specifically, we used a random effects approach to estimate meta-analytic effect sizes, 95% Confidence Intervals, 80% Credibility Intervals, and $SD\rho$ as a measure of effect size variability per recommendations by Schmidt and Hunter, (2015). We specified meta-analytic estimates to only incorporate corrections for unreliability in WFC measures, as estimates of reliability for telework measures were rarely reported. Further, as not all WFC measures were reported with a suitable estimate of reliability, we implemented the artifact distribution method of correction described by Hunter and Schmidt, (2015) instead of correcting each individual study for unreliability.

There were three cases where we had to consider non-independence in effect size (Schmidt & Hunter, 2015). Specifically, each of the three studies used a longitudinal

[2] One study (Solis, 2017) reported a sample of 50% female. We excluded this study from the Gender moderator analysis.

design and reported the relationship between telework and WFC at multiple timepoints. Given there were not enough obtained studies to assess a longitudinal relationship between telework and WFC, we felt it best to extract the effect size relating telework and WFC from each of these studies to best correspond with rest of the sample we obtained.

Finally, we evaluated moderators using the subgroup approach suggested by Schmidt and Hunter, (2015). Thus, we conducted meta-analyses on groups of studies in our sample that reflected various levels of the moderators we evaluated. Following sample size recommendations, we only conducted moderator evaluations when all levels of a moderator could be represented by at least five studies.

Results

Telework Effects on Work-Family Conflict

We report all hypothesized results in Table 3. In Hypotheses 1(a-b) we proposed telework would be associated with lower levels of both WIF and FIW, respectively. Our hypotheses were partially supported. Specifically, we identified a small, but statistically significant and negative relationship between telework and WIF. However, telework was not significantly related to FIW in our analyses. The meta-analytic correlation corrected for unreliability between telework and WIF was $\rho = -0.09$ ($k = 29$, $N = 34{,}283$, 95% $CI = [-0.13, -0.05]$, 80% $CV = [-0.24, 0.06]$, $SD\rho = 0.11$), and the CI for this correlation did not include zero. The meta-analytic correlation corrected for unreliability between telework and FIW was $\rho = 0.05$ ($k = 15$, $N = 4{,}093$, 95% $CI = [-0.04, 0.13]$, 80% $CV = [-0.14, 23]$, $SD\rho = 0.14$) and the CI for this correlation did include zero. Thus, we only provide evidence in support of Hypothesis 1a. Our findings do not support Hypothesis 1b.

Table 3 Meta-Analytic Relationship of Telework with Criterion Variables: Hypotheses 1–3

Variable	*k*	N	*ρ*	95% CI	80% CV	*SDρ*
WIF	29	34,283	-.09*	-.13, -.05	-.24, .06	.11
Majority Female	14	4,018	.03	-.11, .17	-.30, .35	.24
Majority Male	11	29,487	-.11*	-.15, -.07	-.19, -.03	.06
Continuous	16	6,961	-.02	-.13, .10	-.30, .26	.21
Dichotomous	12	26,881	-.11*	-.15, -.08	-.18, -.04	.05
FIW	15	4,093	.05	-.04, .13	-.14, .23	.14
Continuous	9	4,093	.05	-.04, .13	-.14, .23	.14
Dichotomous	6	3,195	.07	-.05, .19	-.13, .27	.14

CI = confidence interval. *WIF* = Work interfering with family. *FIW* = Family interfering with work. Analysis of moderators of the relationship between Telework and WIF presented on indented lines under WIF heading. * $p < .05$

Moderating Effects

We identified substantial heterogeneity in the relationships between telework and both WIF and FIW (*SDρ*'s of both relationships greater than 0.05, Carlson and Ji, 2011). Based on these findings, we evaluated the moderating effects of gender and telework measurement on the relationship between telework and WFC. However, we only identified enough studies reporting WIF to test all moderating effects, whereas we only were able to test the moderating effect of measurement for FIW.

In Hypothesis 2, we proposed gender would moderate the negative relationship between telework and work-family conflict, such that this effect would be weaker among women (i.e., demonstrate reduced benefit). We found evidence to partially support this hypothesis. Specifically, majority-female samples in our analyses exhibited a positive, yet nonsignificant relationship between telework and WIF ($\rho = 0.03$, $k = 14$, $N = 4{,}018$, 95% $CI = [-0.11$ to $0.17]$, 80% $CV = [-0.30, 0.35]$, $SD\rho = 0.24$). Alternatively, majority-male samples exhibited a negative (i.e., beneficial) relationship ($\rho = .-11$, $k = 11$, $N = 29{,}487$, 95% $CI = [-0.15, -0.07]$, 80% $CV = [-0.19, -0.03]$, $SD\rho = 0.06$,). Further, in our evaluation of heterogeneity we identify substantial variability among majority-female samples, which suggests additional moderators. Thus, our results lend partial support for Hypothesis 2 as we expected women to experience less benefit from telework than men, but still experience some degree of benefit. However, our results show that telework shows no benefit for women (i.e., a non-significant effect). Additionally, it is unlikely that the non-significant relationship between telework and WIF seen within primarily female samples is a due to sample size. Though there is a large difference among majority-female versus majority-male samples ($N = 4{,}018$ and 29,487, respectively), each sample likely provides sufficient power to test an effect that is meaningfully different from zero.

Further, in Hypothesis 3 we proposed telework measurement would meaningfully influence reported effect sizes, such that studies utilizing a continuous measure of telework would demonstrate a stronger (i.e., more nuanced) negative relationship between telework and WFC. Telework measurement significantly impacted study findings, although contrary to our proposed hypothesis. Studies including a continuous measure of telework revealed a weak, non-significant relationship between telework and WIF overall, with meaningful effect size heterogeneity across studies ($\rho = .-02$, $k = 16$, $N = 6{,}961$, 95% $CI = [-0.13, 0.10]$, 80% $CV = [-0.30, 0.26]$, $SD\rho = 0.21$). Alternatively, studies including a dichotomous measure of telework demonstrated a significant, beneficial relationship with WIF that was relatively homogenous across studies ($\rho = -0.11$, $k = 12$, $N = 26{,}881$, 95% $CI = [-0.15, -0.08]$, 80% $CV = [-0.18, -0.04]$, $SD\rho = 0.05$). Focusing on FIW, studies including a continuous measure of telework demonstrated a positive (i.e., detrimental), non-significant relationship with FIW ($\rho = 0.05$, $k = 9$, $N = 4{,}093$, 95% $CI = [-0.04, 0.13]$, 80% $CV = [-0.14, 0.23]$, $SD\rho = 0.14$). Studies using a dichotomous measure of telework showed similar results as well ($\rho = 0.07$, $k = 6$, $N = 3{,}195$, 95% $CI = [-0.05, 0.19]$, 80% $CV = [-0.13, 0.27]$, $SD\rho = 0.14$). Use of both continuous and dichotomous measures of telework exhibited high effect size heterogeneity as well. Again, we encourage readers to consider the differences in these relationships along with differences in sample sizes among groups of studies.

Discussion

Telework and Work-Family Conflict

We hypothesized two main effects for the current study: telework would be negatively, albeit beneficially, associated with bi-dimensional measures of work-family conflict (i.e., work interference with family and family interreference with work). Across studies we found a significant, beneficial relationship between telework and WIF, but a non-significant, positive relationship between telework and FIW. According to traditional conventional standards for effect sizes, our reported relationship between telework and WIF did not meet the criteria for classification as even a small effect (Cohen, 1983). However, more contemporary meta-analytic literature on the meaning of effect sizes (Bosco et al., 2015) suggests the reported relationship would be appropriately considered as medium (e.g., $r = 0.09–0.26$). Moreover, the observed effect size in our meta-analysis is not substantially different from the effect size found in Gajendran and Harrison's (2007) meta-analysis on telework and WIF ($\hat{\rho} = -0.16$). Therefore, these results may reflect the expectation that telework reduces WFC via increased perceptions of flexibility for conducting one's work beyond that experienced within the conventional office setting (Gajendran & Harrison, 2007). Importantly, future work should collect data to address this potential explanation directly.

Nonetheless, our observed effect size for the relationship between telework and FIW contrasted our original hypothesized effect size by way of a positive, non-significant effect. This effect was also substantially weaker than the effect ($\hat{\rho} = -0.15$) reported by Gajendran and Harrison, (2007). We attempt to interpret these findings through dual perspectives. First, given our analysis of the relationship between telework and FIW included less than half the studies included to test the main effect between telework and WIF, it is possible that estimating this effect is more susceptible to inter-study variability. Thus, the hypothesized and previously observed negative relationship may become clearer as evidence accumulates.

Alternatively, the positive relationship between telework and FIW may reflect concerns from prior authors (Standen et al., 1999) in which teleworking can exacerbate the opportunity for nonwork disruptions into one's workday via lessened control over work and home boundaries stemming from the increased physical proximity of work and home while teleworking (Smith et al., 2021). For example, during COVID-19 many workers began teleworking among the presence of children and familial others as both organizations and school systems transition to fully remote capacities. During this time, many working parents were more likely to experience interruptions during their workday to attend childcare responsibilities and assisting with their children's virtual learning. Other examples include more trivial interruptions, such as the need to sign for a delivery while engaging in deep work or distraction by other in-home factors such as pets, household chores, or other family members working within the home.

Thus, even when utilizing one's option to telework to balance familial or nonwork pressures, thereby decreasing WIF, diminished control over one's in-home

boundaries may contribute to spillover of non-work pressures on an individual's work hours. These results seem to further convolute the discussion of the beneficial impact of telework on WFC. However, it may be that to fully capture the benefits of teleworking for balancing one's work and home roles, workers might be best served by scheduling their teleworking hours on days or times when they are less likely to experience disruptions and have more control over their work and nonwork boundaries, such as when dependents or partners are absent from the home. Although, we acknowledge variations in the extent to which this recommendation may be considered by workers facing barriers to non-work resources (e.g., accessible child or elder care).

Moderators

Gender

As predicted, the relationship between telework and WIF was significantly influenced by gender. Majority-male samples consistently demonstrated a negative relationship between telework and WIF, whereas majority-female samples reported a nonsignificant relationship between telework and WIF with a notably large amount of effect size variability. These results somewhat mirror qualitative accounts wherein women report increased difficulty managing multiple roles while teleworking (Mann & Holdsworth, 2003). Additionally, in prior studies women have reported utilizing their option to telework to attend to familial or non-work responsibilities such as childcare (Olson & Primps, 1984), potentially centralizing their time and effort within their role as a caretaker. Under these circumstances, it is possible the supposed flexibility which telework allows is only experienced by way of flexibility in one's work location (e.g., home vs. central organization). Thus, as women may be more likely to spend time performing multiple roles (e.g., worker, partner, parent) when teleworking, the relocation of work responsibilities within the home may not adequately ameliorate demands between work and family under certain conditions.

Telework Measurement

Contrary to our prediction that utilizing continuous measures of telework would result in a stronger negative relationship between telework and WIF, we instead found dichotomous measurement of telework resulted in a significantly stronger negative effect. This finding was especially surprising considering the notion that dichotomizing continuous variables results in a significant loss of information (Cohen, 1983; Altman & Royston, 2006). One explanation for these findings is the large effect size heterogeneity among studies using continuous telework measures. For example, the variety of approaches we observed to measure telework continuously (e.g., percentage of time spent teleworking, number of hours spent teleworking, Likert-type measures of telework) may vary substantially in appropriately capturing teleworking behavior. Thus, at least when considering the effects of telework on WFC, the field's current understanding might be muddled because

of inconsistent measurement. We expect the field will nonetheless benefit from the utilization of continuous measures of telework (i.e., extent of telework or hours/days spent teleworking in a week) to delineate a more transparent understanding of the relationship between telework and WFC, but perhaps that future work should outline best practices in telework measurement.

Limitations and Directions for Future Research

Methodology

The current study has several limitations. Though our hypotheses presume causal relationships between predictor and criterion variables, the cross-sectional nature of most studies included in our analysis do not allow for causal inferences. In fact, prior longitudinal research has found evidence that relationships more typically expected to occur in one causal direction (e.g., work-family conflict causing strain) may occur in the opposite direction (Kinnunen et al., 2010). For example, our findings may reflect instances where workers experiencing greater overall WFC, specifically WIF, may avoid teleworking due to fears of greater permeability between work and home (Standen et al., 1999). Nonetheless, we uphold cross-sectional studies are useful for gathering initial evidence on relationships between variables and lend to excluding alternative explanations or hypotheses (Spector, 2019).

Moreover, while 25 of the total 29 studies included in the current meta-analysis were cross-sectional, four studies were longitudinal. However, for two (Mills & Grotto, 2017; Spilker, 2014) of these four longitudinal studies, we only utilized measures of telework and WFC variables from the first time-point in the study, essentially making those data cross-sectional for our purposes. The remaining two studies (Lapierre et al., 2016; Smith et al., 2021) reported a correlation coefficient considering all time-points. Thus, having only two functionally longitudinal studies in the current meta-analysis may convolute results. Future research on the relationship between telework and WFC variables should use more longitudinal, and ideally experimental, research designs, as these may provide appreciably more information on potential causal relationships.

Further, differences in observed results between telework and WIF for majority-female and majority-male samples, as well as studies using continuous versus dichotomous measures of telework, may be the result of differences in sample sizes among levels of each category. These concerns were outside of our control for the present analyses. However, future research will benefit from additional empirical inquiry into teleworking experiences by gender. Additionally, future meta-analyses of those studies will benefit from increased power should meta-regression be used to assess moderation effects. Meta-regression may be more appropriate to assess gender as a continuous moderator but requires a substantially larger number of studies to detect effects when compared to the categorical moderation strategy we employed here (Hunter & Schmidt, 2015). As such, future meta-analytic work may be better suited to address the limitation of the approach used here.

Finally, despite results suggesting a stronger relationship between telework and WFC when telework was measured dichotomously versus continuously, we advocate for the incorporation of continuous measures of telework to expound on the current findings. Continuous measures, such as the extent of telework (Golden & Veiga, 2005), are likely to provide a more nuanced understanding of the lived experiences of workers managing their work and home domains via teleworking and may be less vulnerable to measurement error (Beckel & Fisher, 2022). However, for greater consistency, future research utilizing continuous measures should look to identify a best practice measure of telework, such as the extent of telework (e.g., percentage of one's working hours spent teleworking; Golden & Veiga, 2005), versus choosing telework measurement based on sample or data constraints. Using a single type of continuous measure may reduce heterogeneity of effect sizes across studies.

Covid-19

Whether data from the included studies was collected before or during the COVID-19 pandemic and associated increases in telework is another contextual factor which may influence the generalizability of our current results. We included three studies within our analyses which were explicitly conducted during the Covid-19 pandemic (Allgood et al., 2022; Li et al., 2022; Xu et al., 2022), as well as one study which may have been implemented during COVID-19, though not explicitly stated (Smith et al., 2021). Of these studies, none of the authors mentioned how the pandemic may influence the relationship between telework and WFC variables directly.

However, incorporation of both pre-pandemic as well as more current studies lends to several considerations. For instance, Allgood et al., (2022) note that proportionally small response rates within their study may have been influenced by employees and organizations focusing their attentions on adapting to the pandemic rather than on tasks such as responding to academic surveys. Additionally, the pandemic serves as a relevant and potentially severe confound when comparing teleworkers versus non-telework, as group categorization may be determined by whether employees held an essential or non-essential role in the organization (i.e., front-line workers). Given these considerations, future research should examine whether the relationship between telework and WFC differs based on whether research was conducted before, during, or after the COVID-19 pandemic, especially as telework is likely to remain a popular working practice as we transition through the Covid-19 pandemic.

Cross-Cultural Considerations

Previous authors have also noted uncertainty regarding how distinct cultures may conceptualize WFC (Allen et al., 2015a). There is some evidence that experiences of WFC may vary depending on cultural context (Grzywacz et al., 2007); therefore, the results from the current study may be subject to measurement invariance between U.S. and non-U.S. samples. As noted by Allen et al., (2015a), the utilization of databases including translated measures and reports of measures that demonstrate

measurement equivalence would benefit future cross-national research, especially related to experiences of WFC. In the current meta-analysis, 20 out of the total 29 samples were from the U.S. Of the 10 samples that were not from the U.S., seven of 10 were from U.S. journals. In our case, the primarily U.S. based sample is likely a result of limiting our search criteria to English-written journals. Relatedly, it may also be that there is more research conducted on telework and WFC variables within the U.S. due to population or policy differences between the U.S. and other English-speaking nations such as England and Australia.

Sample Size

Finally, the number of studies ($k = 29$) should be acknowledged as a potential limitation. Though aggregating results from many individuals, meta-analytic estimates are still subject to second-order sampling error (Hunter & Schmidt, 2015), suggesting that the effect estimates presented here should be considered preliminary. In other words, both the size of the meta-analysis as well as the observed effect size heterogeneity suggests the potential for meaningful variability when generalizing our findings to new samples in future research. However, a quantitative analysis of the literature is still likely more informative than an error-prone narrative summary (Schmidt et al., 1985). Despite this limitation, we believe our study is the best approach to summarizing extant work to support future research in this domain (DeSimone et al., 2019). Though our meta-analysis includes studies as recent as 2023, we did not explicitly evaluate the role of the COVID-19 pandemic in our effect size estimates as a sufficient number of studies that also met our inclusion criteria have not been conducted yet. However, we expect this state of the literature to change given the ongoing nature of the pandemic and its influence on telework (Parker et al., 2022), which we suggest increases the value of our preliminary meta-analytic work in terms of the future work that it may inform.

Implications for Practice

Per our findings, we propose several practical recommendations for organizations. Overall, our findings demonstrate a consistent and beneficial relationship between telework and WIF. Despite eventual resolution of the COVID-19 pandemic, organizations are likely to continue to implement telework policies and arrangements for workers desiring flexibility between their work and home domains (Global Workplace Analytics, 2020b). Our findings suggest organizations may need to reconsider how the implementation of telework programs affects employees' abilities to manage their familial or non-work roles due to pressures from their work.

Nonetheless, organizations providing opportunities to telework might consider the nature of how employees choose to telework given the effect size heterogeneity we observed. For instance, if women report utilizing telework to better manage their non-work roles or responsibilities (i.e., opting to telework to care for sick

children or as a childcare replacement) then teleworking may lead to increased experiences of WFC. Under certain circumstances, employees may be better served through organizational practices which more completely remove stressors from one's work-role from their non-work domains. For instance, organizations may better support working mothers, and parents holistically, in their organizations through practices such as paid sick leave, including leave for dependent care, or additional benefits such as childcare stipends. However, although we present these recommendations in response to the increased rate of work-family conflict among primarily female samples in our study, we also acknowledge accommodations meant to better the working conditions for a given demographic often also benefit workers as whole (Bonaccio et al., 2020). Thus, although we found increased rates of work-family conflict among female samples in our study, organizations should look to apply practices which benefit workers more broadly, such as providing paid parental leave versus solely maternal or paternal leave, respectively.

Likewise, if organizations are more likely to provide telework as a work practice to support workers' non-work roles and mitigate the impact of diminished national level supports, they should consider whether telework is consistently beneficial for supporting employees' work roles within the confines of their homes or if teleworking leads to increases in non-work interruptions during work. Again, workers will likely benefit from policies which more concretely divide their work and home domains.

Conclusion

Variations in empirical and anecdotal claims regarding the effects of telework have convoluted the field's understanding of whether teleworking is effective for managing both one's work and home domains. Our findings begin to converge prior literature and demonstrate the overall beneficial effects of telework for mitigating work-role pressures within one's home. However, these effects might be attenuated for women, and we advocate for organizations to consider the consequences of blanket applications of telework under the pretense of family-supportive policies. Lastly, for researchers looking to extend the present results we provide insight on the dependency of our findings on how we conceptualize, and consequently measure telework among the field. Future research and practice will only benefit by reaching consensus on how telework is defined and measured. Our work sheds light on aspects of the relationship between telework and WFC that are consistent as well as areas to resolve through further inquiry.

Declarations

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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