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Work–Family Crossover: A Meta-Analytic Review

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Crossover theory describes the transmission of stress/strains that are experienced by one person to another (Westman, *Human Relations*, *54*, 2001, 717–752). In our article, we review the extant literature and present results from a meta-analysis—the first ever of this literature—to shed light on the magnitude of the crossover effect, the predictors and outcomes of crossover, and the psychological process underlying the crossover effect. Our meta-analysis offered evidence of crossover of the role sender's work stressors, work attitudes, and work-to-family conflict (WFC) to the role receiver's psychological distress, family satisfaction, and work attitudes. We also found some support for the hypothesis that the role sender's positive social behavior mediates these effects.

Keywords: crossover, work–family conflict, family satisfaction, psychological distress

When organizational scientists study the social transmission of stress/strain, they tend to emphasize crossover between individuals within a specific life domain. For example, burnout has been found to cross over from leaders to their subordinates (Hakanen et al., 2014). Burnout has also been found to cross over among coworkers, diffusing between soldiers (Bakker, Westman, et al., 2007; Study 2), medical doctors (Bakker et al., 2001), and nurses (Bakker et al., 2005). This work, though important, is limited in at least one aspect. Because of its emphasis on a single life domain (work in this case), this research is less able to tell us how stress/strain from one domain affects other domains. An intriguing parallel literature exists within the work–family literature wherein the demands for resources from one life domain (such as work) make it difficult for individuals to meet their responsibilities in other domains (such as family; Greenhaus & Beutell, 1985). For example, experiencing work distractions (Cardenas et al., 2004) and discrimination (Sun et al., 2020) reduces employees' family satisfaction. This body of work shows that stress can be transmitted from one life domain into another.

This cross-domain transmission of stress and strain was originally identified by qualitative interviews of working people (e.g., Piotrkowski, 1979; Repetti, 1987). In her famous study of American working-class women, Rubin (1976) found that many women sought to balance career and housework. Sometimes, the transition from one domain to another was positive ("I even used to be more organized around the house when I was working," p. 182). At other times, these women faced challenges from husbands who did not appreciate changing gender roles ("I think a mother should stay home with the kids. I told her when we first got married that I'd earn the money and she'd take care of the kids," p. 180). Still more, husbands would sometimes come home, exhausted from their own jobs or, perhaps, alienated from their workplaces and this would impact how their wives felt ("I know he's tired and that he's got all those projects to do. But still, sometimes I feel like I'll go crazy if we don't go someplace," p. 188). Building on this earlier qualitative work, Bolger et al. (1989, p. 175) distinguished stress spillover from crossover. Spillover is a within-person process in which a given person carries his or her psychological state from one domain into the other. In contrast, crossover is a between-person process in which a person's psychological state in one domain impacts the psychological state of a different person in another domain, usually, the family (Westman, 2001). Stated more formally, there are at least two parties in the stress crossover process, a role sender and a role receiver. The role sender initiates the crossover process, whereas the role receiver is on the receiving end of the crossover.

Based on role theory (Kahn et al., 1964), Westman (2001) reasoned that, due to the interdependent nature of relationships, crossover between individuals is most appropriately assessed with dyads as the unit of analysis. Westman's (2001) theoretical explanations of crossover include three mechanisms. The first mechanism is a direct crossover of stress/strains from one spouse to the other, which refers to the extent to which "the experience of one partner directly elicits a response in the other partner" (Sprung & Jex, 2017, p. 220). Westman (2001) noted that direct crossover likely occurs as a result of the role receiver's empathy toward the role sender. The second mechanism is an indirect crossover, which occurs when the role sender withholds positive social behaviors that impact the role receiver in a process that leads to cross-partner stress transmissions (Westman, 2001, 2006). The third mechanism, common stressors, occurs when both partners are exposed to the same stressors (Song et al., 2011). For example, crossover could occur when both the husband and the wife

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struggle with financial difficulties or poor health. Thus, some shared stressors (e.g., economic hardship) may lead to common effects (e.g., anxiety and dissatisfaction) in both partners.[1]

Despite the growing interest in crossover research, the literature is still limited in a number of ways. First, crossover theory suggests that the experience of the role sender may impact the role receiver (Westman, 2001). However, this literature often views crossover as a homogeneous process, failing to distinguish the different variables that may cross over from one spouse to the other. This omission is problematic as it implicitly assumes that the crossover effects associated with different variables are indistinguishable from each other, which runs counter to the variability of crossover effects often observed in the literature (e.g., Mauno & Kinnunen, 1999; Westman et al., 2004). We overcome this limitation in our meta-analysis by using crossover theory (Westman, 2001) to identify three sets of predictors: role senders' work stressors (e.g., work demands and pressure), work attitudes (e.g., job satisfaction and engagement), and work-to-family conflict (WFC). We not only examine the magnitude of the effects associated with each predictor but also assess the relative effects of these three sets of predictors by including them in a simultaneous analysis.

Second, crossover research on the role receiver tends to focus on their psychological distress and family satisfaction (e.g., Wang et al., 2019; Westman et al., 2004). However, this view may be incomplete as recent research suggests that the effect of crossover does not end at home and may also influence the role receiver's own work attitudes (Booth-LeDoux et al., 2020). By including all three role receiver outcomes (psychological distress, family satisfaction, and work attitudes), we provide a more complete picture of the potential far-reaching effects of crossover.

Finally, we draw on the indirect process of the crossover model (Westman, 2001) to examine a mediating mechanism: The role sender's positive social behavior. Positive social behavior refers to the functional behavior that the role sender exhibits toward the role receiver at home. This can include such things as offering social support and refraining from undermining the partner. Our model suggests that when the role sender experiences work stressors, WFC, and negative work attitudes, he/she may display less positive social behavior in interactions with the role receiver. This may cause the role receiver to experience psychological distress, family dissatisfaction, and negative work attitudes (see Figure 1). Thus, we respond to the criticism of the crossover literature by explicitly modeling the psychological process through which crossover occurs (Brough et al., 2018).

The time has come to take stock of what is known about crossover, identify what remains unknown and under researched, and shed light on what lies ahead. From a practical standpoint, knowing the extent to which employees' work experiences impact their partners and how these effects occur may also provide important input into workplace decision-making, suggesting that the perspective of the employees and the perspective of their family members should be both taken into consideration.

Literature review

Direct Crossover

According to the direct crossover process (Westman, 2001), spouses often take on the psychological states of their partners (Bakker et al., 2006; Bakker, Westman, et al., 2009; Westman, 2001). In other words, due to feelings of empathy, one spouse "catches" the psychological state of the other spouse. This results in the transmission of psychological states from one to another. Song et al. (2011, p. 152) noted that direct crossover "is indicated by a correlation between the stress reported by one person and the strain indicated by another."

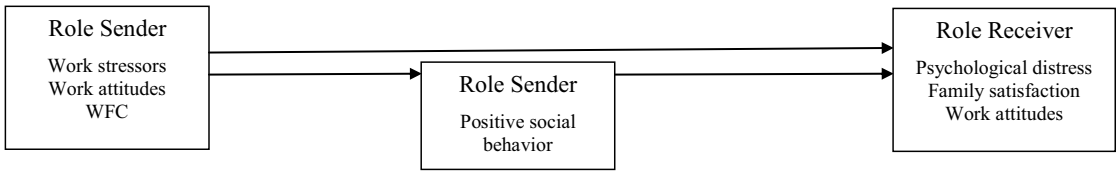
Crossover is a general phenomenon, with different researchers considering various antecedents and consequences. For the antecedents, we focus on the role receiver's work stressors, work attitudes, and WFC. These antecedents are chosen for both theoretical and practical reasons. Theoretically, for direct crossover to occur, the role receiver "must perceive the employee's emotional or physical state" (Booth-LeDoux et al., 2020, p. 735). Work stressors, work attitudes, and WFC all have emotional and physical manifestation in the home domain, thereby allowing spousal empathy and crossover to emerge. Practically, they are more often studied in the crossover literature than other predictors (see Steiner & Krings, 2016). In terms of crossover consequences, we focus on role receiver psychological distress, family satisfaction, and work attitudes (Steiner & Krings, 2016). Psychological distress is an indicator of well-being that includes such states as anxiety, depression, psychological health, and exhaustion (Ritter et al., 2016). Family satisfaction refers to positive evaluations of one's family domain (Ferguson, 2012). Indicators of family satisfaction include marriage satisfaction, relationship tension, and relationship quality, among others. Work attitudes refer to one's positive perceptions/evaluations of the work environment. In accordance with other meta-analyses (e.g., Hong et al., 2013; Sojo et al., 2016), we include such work attitudinal variables as job satisfaction, commitment, and engagement.

Work Stressors

A stressor is the antecedent condition that is posited to produce strain reactions (Jex, 1998). Psychological distress is a strain reaction, referring to a negative change in a person's psychological or physical condition as a response to a stressor. Here we argue that the *stressors* in the role sender's work environment cause *psychological distress* in the role receiver. When the role sender experiences stressors in the workplace, the strain spills over to the home domain. Since members of the family share the same physical and psychological space, the role receiver may "catch" the strain of the role sender caused by the role sender's work stressors. For example, when the role sender is overwhelmed by job demands at work, he or she may develop distress and will show the distress when interacting with the role receiver. The role receiver, empathetic to the role sender who suffers from workplace stressors, may catch the role sender's strain expressions. The spillover-crossover model (Bakker et al., 2008) offers support for this argument, suggesting that the crossover process starts with work stressors experienced by the role sender that spill over to the home domain, leading to crossover when the role receiver experiences psychological distress (Demerouti et al., 2005). Additionally, when the role receiver recognizes the role sender's

[1] We chose not to include common stressor in our meta-analysis because the relationship between one partner's "predictor" and the other partner's "criterion" is spurious and would disappear once the effect of the common stressor is controlled for.

Figure 1
Mediating Model



WFC = Work-to-family conflict.

work stress, he/she may take on more family responsibilities. This may result in resource depletion for the role receiver and lead to a lower level of family satisfaction and more negative work attitudes (Goode, 1960). Supporting these arguments, past research has linked the role sender's work stressors to the role receiver's distress, work withdrawal, and marital satisfaction (Ferguson, 2012; Park & Haun, 2018; Ten Brummelhuis et al., 2010).

Hypothesis 1: The role sender's work stressors are positively associated with the role receiver's psychological distress (1a) and negatively associated with the role receiver's family satisfaction (1b) and work attitudes (1c).

Work Attitudes

A second possibility is that role senders' work attitudes act as an antecedent to crossover. When the role sender experiences negative work attitudes, he/she may transmit the negative work experience to the role receiver by complaining about the job experiences (Tian et al., 2017). The role receiver may develop empathetic reactions as he or she tries to imagine how they would have felt if they were placed in the role sender's shoes (Ferguson et al., 2010). Thus, the more negative the role sender's work attitudes, the more likely such negative attitudes may elicit negative reactions on the role receiver causing him/her to experience psychological distress. Additionally, to understand and validate the work attitudes of the role sender, the role receiver may vicariously experience the work attitudes of the role sender (Ferguson et al., 2010). Through a conscious or an unconscious process, the role receiver may develop the same attitude, resulting in the alignment of work attitudes between the spouses (Tian et al., 2017). Finally, direct crossover may come at an emotional cost to the role receiver because he/she has to expend regulatory resources to be sympathetic with the work attitudes of the role sender (Hobfoll, 1989). The increased emotional burden may deplete the role receiver's resource reserve thereby reducing their family satisfaction (Lavner & Clark, 2017). Consistent with this argument, past research has shown that the role sender's work attitudes were positively related to the role receiver's family satisfaction (e.g., Emanuel et al., 2018).

Hypothesis 2: The role sender's work attitudes are negatively associated with the role receiver's psychological distress (2a) and positively associated with the role receiver's family satisfaction (2b) and work attitudes (2c).

WFC

WFC refers to the extent to which one's involvement in the family domain is made difficult as a result of one's involvement in the work domain (Greenhaus & Beutell, 1985). WFC is one of the most studied variables in crossover research in part because this construct represents the interface between work and family domains (Steiner & Krings, 2016). Steiner and Krings (2016, p. 297) noted that the crossover process includes "how an individual's experience passes to another domain, namely through intra-individual spillover, that is, work-family conflict . . . work-family conflict, fostered for example by stressors at work, increases negative marital interactions that in turn decrease the spouse's well-being." The reason why the role sender's WFC impacts the role receiver is similar to our explanation of why the role sender's work stressors/work attitudes cross over to the role receiver (Westman, 2001). Since the role receiver cares about the role sender, he or she may take on the role sender's experiences by imagining himself/herself experiencing WFC (Bakker et al., 2008). As such, they may react negatively by perceiving higher distress, poorer work attitudes, and lower family satisfaction. Although WFC can be considered a class of stressors, work–family research tends to consider it to be more proximal to strain, relative to stressors such as job demands (Geurts & Demerouti, 2003). Consistent with these arguments, past research has linked one partner's WFC to another partner's psychological strain (Liu & Cheung, 2015a), perceived marital quality (Li et al., 2020), and work withdrawal (Hammer et al., 2003).

Hypothesis 3: The role sender's WFC is positively associated with the role receiver's psychological distress (3a) and negatively associated with the role receiver's family satisfaction (3b) and work attitudes (3c).

Models of crossover suggest that when a role sender experiences a work stressor, the stressor may affect his or her work attitudes, WFC, and so forth (Bakker et al., 2008). These ill-effects can then be carried into the home domain impacting the role receiver (Westman, 2001). For instance, if a husband is at risk for downsizing (role sender stressor), this could cause him to experience negative work attitudes and WFC, which might thereby engender marital dissatisfaction in his spouse (role receiver strain, see Westman et al., 2004). Accordingly, the role sender's negative work attitudes and WFC are relatively proximal to the spouse's reactions. However, the role sender's work stressors are relatively more distal. Thus, it is possible that the role sender's work stressors, which are relatively distal to the role receiver's responses, will be a less consistent predictor than will the more proximal predictors, such as the sender's work attitudes and WFC. By including all three predictors at the same time in our meta-analysis, we are able to examine their relative effects on the outcome variables.

Indirect Crossover

Unlike the direct crossover process, the indirect crossover process suggests that one spouse who is under duress may exhibit less positive social behavior toward the other spouse, causing the stress to cross over and the partner to experience negative consequences such as higher psychological distress and more negative job attitudes and family dissatisfaction (Westman & Vinokur, 1998). Social behavioral constructs include social support, emotional intimacy, and social withdrawal (reversed), among others. According to conservation of resource theory (COR; Hobfoll, 1989), having an adequate supply of resources is essential for human functioning. When the role sender experiences work stressors, negative work attitudes, and WFC, he or she may fall into a state of resource depletion. As a result, when the role sender returns home, he or she may not have enough resources to self-regulate during interactions with the spouse. Instead, the role sender may reduce positive social behavior in order to conserve resources, such as not helping with family duties, paying little attention to the spouse's needs, or having irritable interactions with the children. The lower level of positive social behavior by the role sender due to his/her work stressors, negative work attitudes, and WFC may increase the home demands for the role receiver (Bakker et al., 2008; Westman et al., 2004) and create more tension within the family domain, causing the role receiver to experience psychological distress and family dissatisfaction (Matthews et al., 2006). At the same time, the role sender's reduced engagement of positive social behavior may cause strain for the role receiver, depleting his/her resources that could have been applied to work and resulting in more negative work attitudes (Booth-LeDoux et al., 2020). Building on these ideas, Bakker et al. (2009) found that the role sender's WFC caused him or her to provide less social support to the role receiver. This diminished support, in turn, lowered the role receiver's relationship satisfaction.

Hypothesis 4: The role sender's work stressors are negatively related to his/her positive social behavior, which in turn is negatively related to the role receiver's psychological distress (4a) and positively related to his/her family satisfaction (4b) and work attitudes (4c).

Hypothesis 5: The role sender's work attitudes are positively related to his/her positive social behavior, which in turn is negatively related to the role receiver's psychological distress (5a) and positively related to his/her family satisfaction (5b) and work attitudes (5c).

Hypothesis 6: The role sender's WFC is negatively related to his/her positive social behavior, which in turn is negatively related to the role receiver's psychological distress (6a) and positively related to his/her family satisfaction (6b) and work attitudes (6c).

Method

We used a number of approaches to identify studies to be included in the present meta-analysis. First, we employed the PsycINFO database to search for empirical studies up to March, 2020. We initially used the search term "crossover" but were concerned that it might be overly narrow because some studies might have investigated this phenomenon without using the actual term in the abstract or the text. For articles related to work stressors, we used the combination of "couple or husband or wife or partner or spouse or crossover" and "pressure or overload or demand or conflict or ambiguity or security or situational constrain or abusive supervision or discrimination or harassment or incivility or aggression or politics or constrain or insecurity or stress or strain." For articles related to work attitudes, we used the combination of "couple or husband or wife or partner or spouse or crossover" and "job satisfaction or commitment or engagement or turnover intentions or withdraw." For articles related to WFC, we used the combination of "couple or husband or wife or partner or spouse or crossover" and "work and family or conflict or spillover or interfere."

Second, we used a forward search process looking for articles that cited some of the most influential reviews of the crossover literature in Google Scholar (e.g., Bakker & Demerouti, 2013; Westman, 2001, 2006). Third, we employed the search term "work and family" to search the official conference programs of both the Academy of Management (AOM) Annual meeting and the Society for the Industrial/Organizational Psychology (SIOP) Annual conference between 2012 and 2019. We emailed the authors of these conference papers and requested that they share their full papers. Fourth, we requested unpublished manuscripts from scholars through the OB and HR listserves maintained by the AOM. Finally, we reviewed the reference list of the articles that were included in our meta-analysis and published between 2018 and 2020 to identify potential studies.

Inclusion Criteria

We examined the abstract, the method, and the results sections of each study to determine whether the study should be included in the subsequent analyses. We established a number of inclusion criteria to aid our determination. First, the crossover phenomenon occurs between two partners within the same family (the role sender and the role receiver). Therefore, we reviewed each study to examine whether it contains both partners' responses. Second, we excluded studies that did not include any of the study variables of interest. Third, we excluded studies that were not empirical in nature (such as review articles or case analyses). Fourth, most of the studies distinguished the two directions of work–family conflict (work-to-family and family-to-work) but a few did not. In those cases when a scale that combines both directions of conflict was used, we reached out to the authors and asked them to provide the correlations involving the two separate directions of conflict (e.g., Liu & Cheung, 2015b; Sprung & Jex, 2017). Fifth, when the same dataset appeared to have been used in multiple published studies, we decided to use the same effect size only once. Finally, we excluded studies that report other types of crossover (such as supervisor-to-employee crossover). After eliminating those studies that did not meet these criteria, we retained a total of 98 studies for our meta-analysis. Out of these 98 studies, 81 were published in academic journals, eight were conference papers, another eight were dissertations, and one was a book chapter.

Statistical Procedures

In the present study, we used the Meta-Essentials tool developed by Suurmond et al. (2017) to conduct a random-effect meta-

analysis. The Meta-Essentials tool is an Excel-based instrument that takes into consideration both the effect size of individual studies and their sample size. We report the weighted mean effect size, *z*-value, and 95% confidence interval. We used the following criteria to interpret the effect size: A correlation of .10 is considered a small effect size, a correlation of .30 is considered a medium effect size, and a correlation of .50 is considered a large effect size (Koeslag-Kreunen et al., 2018). To assess heterogeneity, we used the *Q*-statistic and I^2. *Q*-statistic captures weighted squared deviation and I^2 captures the percentage of true heterogeneity relative to total variation (Nudelman & Otto, 2019). Significant *Q*-statistic and higher I^2 represent greater heterogeneity. We consider an I^2 of 25% as a low level of heterogeneity, an I^2 of 50% as a medium level of heterogeneity, and an I^2 of 75% as a high level of heterogeneity (Higgins et al., 2003; Valentine et al., 2010). Higher levels of heterogeneity suggest the possible presence of moderators. Since some of the analyses involved a small number of studies, we conducted power analyses based on the formula by Valentine et al. (2010; personal communication, May 12, 2020). Due to the different labels used to describe the same or similar study variables, we decided to follow past research by combining constructs with similar meanings into broader categories (Hong et al., 2013). Appendix A presents the specific primary study constructs/variables that were included in each of these categories.

To examine the simultaneous effect of all three predictors (the role sender's work stressors, work attitudes, and WFC) on the three outcome variables (the role receiver's psychological distress, family satisfaction, and work attitudes), we meta-analytically examined the relationships among the predictors and the relationships among the outcome variables. Although past research has recommended that empty cells be populated by meta-analytic estimates existing in the literature (Landis, 2013), we decided to use our own meta-analytic estimates of these empty cells from the primary studies in the current database. That is because we can ensure that "all of the cells in our meta-analytic matrix were based on the same population of articles" (Colquitt et al., 2013, p. 210). We constructed a correlation matrix that was then used as inputs in the SEM analyses.

To examine indirect crossover, we conducted meta-analytic path analyses. To perform the path-analyses, we also need the meta-analytic estimates of the relationships between the predictor variables and the mediator (the role sender's positive social behavior), and the meta-analytic estimates of the relationships between the mediator and the criterion variables. We again used the empirical studies included in the present meta-analysis to identify and compute these relationships. Each mediating model was examined individually that included the direct effect of the predictor on the criterion as well as the indirect effect through the mediator.

Results

Direct Crossover

Table 1 presents the meta-analytic results. Supporting Hypothesis 1a, we found a small effect size such that the role sender's work stressors were positively related to the role receiver's psychological distress ($r = .07$, $Z = 4.00$, $p < .01$, 95% CI: .03, .11). The *Q*-statistic was not significant ($Q = 27.70$, $p_q = .09$) and I^2 was equal to 31.41%. Power analysis showed that power was .99. Our study also offered support for Hypothesis 1b. We found a medium effect size such that the role sender's work stressors were negatively related to the role receiver's family satisfaction ($r = -.11$, $Z = -3.93$, $p < .01$, 95% CI: −.17, −.05). The *Q*-statistic was significant ($Q = 61.62$, $p_q < .01$) and I^2 was equal to 67.54%. Thus, there was substantial variability among the effect sizes included in this analysis. Power analysis showed that power was .93. Contrary to Hypothesis 1c, the role sender's work stressors were not significantly related to the role receiver's work attitudes ($r = -.14$, $Z = -1.22$, $p = .22$, 95% CI: −.42, .16). The *Q*-statistic was significant ($Q = 76.08$, $p_q < .01$) and I^2 was equal to 93.43%. Thus, there was substantial variability among the effect sizes included in this analysis. Power analysis showed that power was .76. Thus, there did not appear to be sufficient power for this analysis.

Supporting Hypothesis 2a, we found a small effect size such that the role sender's work attitudes were negatively related to the role receiver's psychological distress ($r = -10$, $Z = -5.06$, $p < .01$, 95% CI: −.14, −.06). The *Q*-statistic was not significant ($Q = 11.72$, $p_q = .39$) and I^2 was equal to 6.11%. Power analysis showed that power was .99. Our study also offered support for Hypothesis 2b. We found a medium effect size such that the role sender's work attitudes were positively related to the role receiver's family satisfaction ($r = .19$, $Z = 4.67$, $p < .01$, 95% CI: .10, .27). The *Q*-statistic was significant ($Q = 77.08$, $p_q < .01$) and I^2 was equal to 84.83%. Thus, there was substantial variability among the effect sizes included in this analysis. Power analysis showed that power

Table 1
Meta-Analytic Results

Relationship	*k*	*N*	$\bar{r}$	*z*	95% CI_L	95% CI_U	*Q*	I^2 (%)	Egger's *t*-test	Failsafe-*N*	Power
Work stressors and psychological distress	20	7,079	.07	4.00	.03	.11	27.70	31.41	−.42	154	.99
Work stressors and family satisfaction	21	3,915	−.11	−3.93	−.17	−.05	61.62	67.54	1.70	349	.93
Work stressors and work attitudes	6	1,469	−.14	−1.22	−.42	.16	76.08	93.43	−.70	44	.76
Work attitudes and psychological distress	12	2,905	−.10	−5.06	−.14	−.06	11.72	6.11	−.05	93	.99
Work attitudes and family satisfaction	13	3,364	.19	4.67	.10	.27	77.08	84.43	.07	479	1
Work attitudes and work attitudes	24	5,670	.18	6.41	.12	.23	76.17	69.80	1.85	1,265	1
WFC and psychological distress	24	6,433	.12	5.85	.08	.17	93.75	75.47	−1.40	819	.99
WFC and family satisfaction	26	6,043	−.17	−7.95	−.21	−.12	61.29	59.21	1.03	1,491	1
WFC and work attitudes	10	2,927	−.07	−4.25	−.11	−.03	7.62	.00	−5.86**	62	.91

Note. *k* = number of independent samples; *N* = total sample size; $\bar{r}$ = correlation effect size; 95% CI_L and 95% CI_U = lower and upper bounds of the 95% confidence interval; *Q* = weighted square deviation; I^2 = proportion of true variance relative to total variance. WFC = Work-to-family conflict. ** = Significant at .01.

was 1. Hypothesis 2c was also supported. We found a medium effect size such that the role sender's work attitudes were positively related to the role receiver's work attitudes ($r = .18, Z = 6.41, p < .01$, 95% CI: .12, .23). The Q-statistic was significant ($Q = 76.17, p_q < .01$) and I^2 was equal to 69.80%. Thus, there was substantial variability among the effect sizes included in this analysis. Power analysis showed that power was 1.

Supporting Hypothesis 3a, we found a medium effect size such that the role sender's WFC was positively related to the role receiver's psychological distress ($r = .12$, $Z = 5.85$, $p < .01$, 95% CI: .08, .17). The Q-statistic was significant ($Q = 93.75$, $p_q < .01$) and I^2 was equal to 75.47%. Power analysis showed that power was .99. We found support for Hypothesis 3b. We found a medium effect size such that the role sender's WFC was negatively related to the role receiver's family satisfaction ($r = -.17$, $Z = -7.95$, $p < .01$, 95% CI: $-.21$, $-.12$). The Q-statistic was significant ($Q = 61.29$, $p_q < .01$) and I^2 was equal to 59.21%. Thus, in both analyses, there was substantial variability among the effect sizes. Power analysis showed that power was 1. We found support for Hypothesis 3c. We found a small effect size such that the role sender's WFC was negatively related to the role receiver's work attitudes ($r = -.07, Z = -4.25, p < .01$, 95% CI: $-.11$, $-.03$). The Q-statistic was not significant ($Q = 7.62, p_q = .57$) and I^2 was equal to 0%. Power analysis showed that power was .91.

Publication Bias

We used four approaches to evaluate potential publication bias (Kepes et al., 2012). First, we compared the effect size estimate for published studies with that for unpublished studies. None of the comparisons was statistically significant. Second, we used Egger's regression test whereby a non-significant intercept represents a possible absence of publication bias (Egger et al., 1997). Of all the analyses, all of the intercepts were non-significant except for the relationship between the role sender's WFC and the role receiver's work attitudes (Table 1).[2] Third, we used the Rosenthal Failsafe-N (1979) with a larger N representing a greater number of studies needed to make the effect size non-significant (and a lower likelihood of publication bias). Per the ad-hoc rule, the number required is either small (TRUE) or large (FALSE). None of the analyses reported a TRUE result (Table 1). Fourth, we also examined the funnel plot. When the funnel plot shows a relatively symmetrical spread of the individual effect sizes, it indicates the absence of publication bias. Following Hak et al. (2016), interpretation of the funnel plot is meaningful only when the level of heterogeneity is low. Of the few that could be interpreted, all showed a pattern of symmetrical distributions.[3] These results collectively suggested that there was no evidence of publication bias in our analysis.

Simultaneous Analysis

What are the relative effects of the three predictors? To answer this question, we also meta-analyzed the relationships among the antecedent predictors and the relationships among the criteria (these results can be found in Appendix B). We then created a meta-analytically derived correlational matrix that includes the role sender's job stressors, work attitudes, and WFC and the role receiver's psychological distress, family satisfaction, and work attitudes (Table 2). We used this correlational matrix as input for SEM analyses in Mplus by regressing all three criteria (the role receiver's psychological distress, family satisfaction, and work attitudes) on all three predictors (the role sender's job stressors, work attitudes, and WFC) at the same time. The results of these analyses are presented in Table 3. We found that the role sender's job stressors were significantly related to the role receiver's work attitudes ($\beta = -.11$, $p < .01$) but not significantly related to the role receiver's psychological distress ($\beta = .01$, $p = .53$) or family satisfaction ($\beta = -.03$, $p = .23$). The role sender's work attitudes were significantly related to the role receiver's psychological distress ($\beta = -.09$, $p < .01$), family satisfaction ($\beta = .17$, $p < .01$), and work attitudes ($\beta = .16, p < .01$). The role sender's WFC was significantly related to the role receiver's psychological distress ($\beta = .11$, $p < .01$) and family satisfaction ($\beta = -.14$, $p < .01$) but not significantly related to the role receiver's work attitudes ($\beta = -.01, p = .65$).

Indirect Crossover

Hypotheses 4–6 predicted that the role sender's positive social behavior would mediate the relationship between the role sender's stressors/work attitudes/WFC and the role receiver's outcomes. To conduct these meta-analytic path analyses, we also meta-analyzed the relationships between the antecedent predictors and the mediator and the relationships between the mediator and the outcome variables. The results of these additional analyses are presented in Appendix C. We examined each mediating model individually (Table 4).

We found support for Hypotheses 4a–c. Specifically, the role sender's positive social behavior mediated the relationship between the role sender's work stressors and the role receiver's psychological distress ($\beta = .02$, $p < .01$), family satisfaction ($\beta = -.04$, $p < .01$), and work attitudes ($\beta = -.02$, $p < .01$). Hypotheses 5a–c predicted that the role sender's positive social behavior would mediate the relationship between the role sender's work attitudes and the role receiver's psychological distress, family satisfaction, and work attitudes. As shown in Appendix C, the relationship between the role sender's work attitudes and his/her positive social behavior was not significant (95% CI: 0, .36). Since the predictor was not significantly related to the mediator, the mediating hypothesis was not supported. Thus, Hypotheses 5a–c did not receive support in the present study. We found support for Hypotheses 6a–c. Specifically, the role sender's positive social behavior mediated the relationship between the role sender's WFC and the role receiver's psychological distress ($\beta = .04$, $p < .01$), family satisfaction ($\beta = -.06$, $p < .01$), and work attitudes ($\beta = -.03$, $p < .01$).

Supplementary Analyses

Gender Difference in Crossover

There has been considerable debate on whether crossover from a male partner to a female partner is stronger or weaker than crossover from a female partner to a male partner (Larson & Almeida, 1999; Westman et al., 2009). Empirical research has offered mixed evidence (e.g., Mauno & Kinnunen, 1999; Symoens & Bracke, 2015). We compared male-to-female crossover with female-to-male

[2] The relatively small numbers of effect sizes might have reduced the power of these tests. Thus, caution should be in place when interpreting these results.

[3] Interested readers can request the plots from the first author.

Table 2
Meta-Analytic Correlations Among All the Variables

Variable	1	2	3	4	5	6
1. Role sender stressors	1					
2. Role sender work attitudes	−.16	1				
3. Role sender WFC	.40	−.10	1			
4. Role receiver psychological distress	.07	−.10	.12	1		
5. Role receiver work attitudes	−.14	.18	−.07	−.36	1	
6. Role receiver family satisfaction	−.11	.19	−.17	−.33	.26	1

Note. Harmonic mean of cell sample sizes = 2,491.

crossover for the relationships we hypothesized (Hypotheses 1–3). None of the comparisons was statistically significant.

Gender Egalitarianism as a Moderator

Crossover research has suggested that cultural values may play an important role in the crossover process (Zhang et al., 2013). This is because cultures vary on the specific roles assigned to men and women and what is expected of them at home and work. One such defining cultural value is gender egalitarianism (Emrich et al., 2004). Societies that are high in gender egalitarianism tend to minimize gender differences in work and family role expectations, whereas those low in egalitarianism have greater gender differences in role expectations (Lyness & Judiesch, 2008). We used the country-level value of gender egalitarianism reported in the GLOBE project (Javidan et al., 2004, p. 31) as a moderator. We did not find evidence in support of gender egalitarianism as a moderator of the crossover effects across cultures. These results can be obtained from the first author upon request.

Discussion

Previous research has suggested that stress can cross over from one domain to another, impacting individuals who occupy different life domains (e.g., Park & Haun, 2018; Westman et al., 2004). Our findings are mostly consistent with this contention. When role senders reported work stressors, their partners experienced greater psychological distress and lower family satisfaction. The role senders' work attitudes were negatively related to their partners' psychological distress and positively related to their partners' family satisfaction and work attitudes. Similarly, the role senders' WFC was positively related to their partners' psychological distress and negatively related to their partners' family satisfaction and work attitudes. These findings suggest that spouses' feelings and cognitions are intertwined and stress for one spouse can become stress for the other. Moreover, some of the crossover effects were mediated by the positive social behavior of the role sender.

Table 3
Results of Simultaneous Analyses

Relationship	β	*SE*
DV = Role receiver psychological distress		
Role sender stressors	.01	.02
Role sender work attitudes	−.09**	.02
Role sender WFC	.11**	.02
DV = Role receiver family satisfaction		
Role sender stressors	−.03	.02
Role sender work attitudes	.17**	.02
Role sender WFC	−.14**	.02
DV = Role receiver work attitudes		
Role sender stressors	−.11**	.02
Role sender work attitudes	.16**	.02
Role sender WFC	−.01	.02

Theoretical Implications

Direct Effects

The first goal of our study was to examine variability associated with the crossover effects. We examined three types of crossover predictors: Role senders' work stressors, work attitudes, and WFC. We found that the role sender's work attitudes and WFC were significantly related to the role receiver's psychological distress, family satisfaction, and work attitudes. The role sender's work stressors were significantly related to the role receiver's psychological distress and family satisfaction. The only non-significant effect we observed was the relationship between the role sender's work stressors and the role receiver's work attitudes. Although these results suggest that crossover effects exist in general, they by no means suggest that these effects are homogeneous. The effect sizes ranged from as high as .19 to as low as .07 (see Table 1). For example, although the role sender's WFC was related to all three role receiver outcomes, the magnitude of the relationship between the role sender's WFC and the role receiver's family satisfaction was more than twice the magnitude of the relationship between the role sender's WFC and the role receiver's work attitudes. It is possible that the former relationship was stronger than the latter relationship because one partner's WFC is more proximal to the other partner's family satisfaction than to work attitudes. These findings add significant nuances to the crossover literature, suggesting that rather than assuming that partners in a relationship may influence each other, future research should carefully consider the theoretical proximity of the variables included in the model when proposing a direct relationship between these variables.

The second goal of our study was to focus on the outcome side of the equation. The simultaneous analysis offers interesting insights. Each of the three role receiver outcomes was predicted by two role sender variables. Interestingly, while the role receiver's work attitudes were predicted by the role sender's work-related variables (work attitudes and stressors), the role receiver's psychological distress and family satisfaction were predicted by the role sender's work attitudes and WFC (but not work stressors). It is possible that the work attitudes of one partner are more easily influenced by the work experiences of the other partner. In contrast, the psychological and family experiences of one partner may be influenced by the work and family experiences of

Table 4
Testing of Indirect Effects

Mediating mechanisms	Indirect effects
Role sender's work stressors − role sender's positive social behavior − role receiver's psychological distress	.02**
Role sender's work stressors − role sender's positive social behavior + role receiver's family satisfaction	−.04**
Role sender's work stressors − role sender's positive social behavior + role receiver's work attitudes	−.02**
Role sender's work attitudes + role sender's positive social behavior − role receiver's psychological distress	*NT*
Role sender's work attitudes + role sender's positive social behavior + role receiver's family satisfaction	*NT*
Role sender's work attitudes + role sender's positive social behavior + role receiver's work attitudes	*NT*
Role sender's WFC − role sender's positive social behavior − role receiver's psychological distress	.04**
Role sender's WFC − role sender's positive social behavior + role receiver's family satisfaction	−.06**
Role sender's WFC − role sender's positive social behavior + role receiver's work attitudes	−.03**

Note. *NT* = Not tested because the direct effect of the IV on the mediator was not significant. − = negative association; + = positive association. ** = Significant at .01

the other partner. Past crossover research often focuses on one type of variable for each partner (e.g., the work experiences of the employee in relation to the family experiences of the spouse). Our findings suggest that to fully capture the crossover process, the work and family experiences of both partners should be considered.

An issue that deserves additional attention pertains to gender. We found no evidence that gender acts as a moderator of crossover, a result that is unsurprising given what has been observed in previous research. These results are consistent with the social-role hypothesis which suggests that men and women are similar to each other in their work–family interface experiences (Voydanoff, 2002). That said, it is probably too soon to close the door on the moderating effects of gender, though future investigations may benefit from a closer theoretical look. One possibility is that the effects of a man's strain on a female spouse will be stronger, but mostly when the couple occupies traditional marital roles (Westman et al., 2004). Interestingly, we did not find country-level gender egalitarianism as a moderator of crossover effects. It is possible that the small number of studies might have made it difficult to find moderating effects. It is also possible that most of the studies in our meta-analysis came from western countries such as the United States and the Netherlands. Future research should reexamine this issue when studies from a wider range of countries and cultures are added to the literature.

Indirect Effect

The third goal of our study was to examine the process through which crossover effects occur. We found mixed support for the mediational model. Specifically, we found that the role sender's positive social behavior mediated the relationship between work stressors and WFC and the role receiver's psychological distress, family satisfaction, and work attitudes. Contrary to our predictions, the role sender's work attitudes were unrelated to his/her positive social behavior and, therefore, the effects of work attitudes were not mediated. One possibility is that the work attitudes are modeled directly, rather than exerting their effects indirectly through positive social behavior. Research testing the social information processing model has found that employees model the job satisfaction of their coworkers (e.g., Pollock et al., 2000). In a parallel fashion, it could be that individuals model the work attitudes of their spouse. While this explanation is admittedly speculative, a test of the social information processing model in the context of work–family crossover could be a promising avenue for future research. Alternatively, it could be that the analysis on the relationship between the role sender's work attitudes and his/her positive social behavior was based on five studies. Thus, the relationship might have existed, but we did not have enough power to detect it.

Common Stressor

Although outside of the scope of the present research, our study may also have implications for research on the third crossover mechanism: Common stressor. The same life circumstance that both partners are exposed to may lead to the same stress experiences and reactions (Westman et al., 2008), which may explain some of the relationships we found in the present research. For example, we show that one partner's work attitudes were significantly related to the work attitudes of the other partner. This relationship can be explained by the lack of family resources, which depresses the work attitudes of both partners and results in an artificial relationship between them (Bakker & Demerouti, 2009). In support of this argument, recent research drawing on the common stressor argument showed that eldercare demand at home was responsible for both spouses' time theft (Peng et al., 2020). Similarly, using the common stressor argument, Howe et al. (2004) showed that a stressor such as a job loss may result in stress for one member of the household (primary stress) and create cascading events that cause stress for another member (secondary stress). Such a model can potentially explain the relationship between the role sender's work stressors and the role receiver's psychological distress that we found in the present study. Although we focus on social interactions as the explanatory mechanism for crossover, it is important to note that indirect crossover and common stressor crossover are not mutually exclusive (Westman & Vinokur, 1998). Thus, future research should examine how multiple mechanisms may jointly explain the crossover process from one partner to the other.

Practical Implications

The results of our meta-analysis show that the workplace experience of the role sender may cross over to the family domain

impacting the psychological distress, family satisfaction, and work attitudes of the partner. Therefore, we agree with other researchers that organizational work–family interventions should also target family members of the employee (Green et al., 2011; Matthews et al., 2006). For example, organizations may offer counseling for couples who struggle with balancing work and family needs. Organizations can also increase the involvement of partners by soliciting their perceptions of organizational cultures and practices. For example, organizations might include partners of employees in workplace wellness surveys or conduct focus groups that include employees' family members (Wayne et al., 2013).

Additionally, past research has shown that employees who are able to create segmented boundaries between work and family are more likely to protect their family members from negative crossover from work (Liao et al., 2016). Therefore, managers of employees who experience work stress should encourage their followers to adopt a segmenting style of boundary management. For example, employees are urged to limit their work activities to regular business hours and try to disconnect themselves from work while at home.

Strengths, Limitations, and Future Research

Our study has two notable strengths. First, by distinguishing different sets of crossover predictors and their effects on different types of outcomes, we present the most comprehensive review of the crossover literature to date. Second, because the crossover phenomenon involves two parties (the role sender and role receiver), the estimates presented in our analyses are less likely to suffer from same-source bias. This may also explain why some of our analyses involve a relatively small number of effect sizes due to the challenge of collecting data from two individuals in a relationship, as opposed to collecting data from a single source.

Several limitations of the study should be noted. First, most of the studies included in the meta-analysis used a cross-sectional design making it impossible to make causal inferences. While we predict that the role sender's positive social behavior may antecede the role receiver variables, it is also possible that their relationship is reciprocal. Thus, causal inferences can be made stronger using a longitudinal or daily diary design (Casper et al., 2007). Second, some of the estimates were based on a small number of studies (Hunter & Schmidt, 2004). We urge future research to reexamine our findings as the literature continues to grow. Third, we focus on the effects of crossover on role receivers' attitudes rather than their actual behavior. Past research has shown that one spouse's work–family conflict is related to another spouse's work behavior such as production deviance (Ferguson et al., 2012). Unfortunately, due to the lack of empirical studies we were unable to examine this possibility meta-analytically. Fourth, we found high degrees of heterogeneity in our analyses. Future research should consider other theoretically based moderators to explain the variations across studies. Finally, each of the broad categories (e.g., work attitudes and work stressors) includes a variety of discrete constructs. We placed them into the same category because they are theoretically related. Future research should examine whether the effects we observed in the present study may be moderated by meaningful differences among variables within the same category as the literature continues to grow.

Our study may inspire other research opportunities. First, our study focuses mostly on crossover between heterosexual partners. There is a need for more research that examines work–family crossover among same-sex couples. Unlike opposite-sex couples, same-sex couples face additional challenges at work, such as discrimination on the basis of their sexual orientation and the difficult decision on whether to come out to their colleagues (versus staying in the closet, Griffith & Hebl, 2002; Ragins & Cornwell, 2001). Williamson et al. (2017) found that an employee's sexual disclosure at work was significantly related to his/her same-sex spouse's family satisfaction, suggesting that unique challenges associated with sexual orientation may have implications beyond the work domain. Although explicit biases based on sexual orientation may have become less common, implicit biases still exist which may hinder individuals' career development (Rule et al., 2016). Future research should examine how employees' experiencing subtle negativity due to their sexual orientation may seep into the family domain to impact their family members. In addition, past research has suggested that individuals' family experiences may cross over into the work domain to impact their coworkers (e.g., Ten Brummelhuis et al., 2010). Future research should examine whether this process may unfold differently for sexual minorities who feel compelled to conceal their sexual orientation from their supervisors/coworkers.

Second, there are other family members who may also be influenced by an employee's work experience, such as children (Lim & Kim, 2014; Vieira et al., 2016). For example, past research has shown that parents' money anxiety due to job insecurity may impact their children's money anxiety (Lim & Sng, 2006, see Mauno et al., 2017, for a review). Future research should examine whether children may impact their parents' work experience in a reverse crossover process. For example, when a child is bullied, his/her parents may experience negative moods/emotions at home (child-to-parents crossover). When the parents bring the negative moods/emotions to work, they may negatively impact their coworkers (parents-to-coworker crossover). Such investigations can greatly enrich the nascent double-crossover literature (Carlson et al., 2019).

Third, most of the literature is somewhat asymmetrical in that it focuses primarily on the family as the recipient of employees' strain in the crossover process. Future research should reverse the direction of crossover by examining how the stress that employees experience at home may cross over into the work domain and impact their coworkers.

Fourth, crossover research rarely considers how the crossover process may be influenced by the characteristics of the role sender and receiver (Lu et al., 2016). Understanding the interplay between the sender's and the receiver's characteristics will help researchers define more precisely when and how crossover will occur (Song et al., 2011). Finally, our study includes three predictors of crossover for both theoretical and practical reasons. However, extant research has examined other variables that may cross over, such as personality (Xie et al., 2018), work–life balance (Schnettler et al., 2020), or workaholism (Bakker, Demerouti, et al., 2009). We urge future research to consider these and other constructs as the crossover literature evolves.

In conclusion, our meta-analysis suggests that crossover researchers have identified an important phenomenon. Though a number of limitations remain, this work has considerable promise. We hope

that by taking stock of the past and anchoring the future, our review will serve as a guidepost for future crossover research.

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(*Appendices follow*)

Appendix A

Primary Study Variables Included in the Categories

Work stressors	
Emotional demands	Time pressure
Incivility	Work demands
Inequity at work	Work load
Job insecurity	Work overload
Job strain	Work pressure
Job stress	Work stressors
Job/work demands	Workplace aggression
Psychological contract breach	
Psychological distress	
Anxiety	Mental health*
Burnout	Negative affect
Depression	Parental distress
Distress	Psychological health*
Exhaustion	Psychological strain
Family stress	Psychological wellbeing*
Frustration	Spouse boundary management strain
Job exhaustion	Strain
Life stress	
Work attitudes	
Work commitment	Relational investment at work
Work engagement	Turnover intentions*
Job rewards	Work rumination*
Job satisfaction	Work withdrawal*
Job self-efficacy	
Family satisfaction	
Family cohesion	Marital wellbeing
Family conflict*	Marriage satisfaction
Family satisfaction	Parental satisfaction
Marital adjustment	Relationship quality
Marital quality	Relationship satisfaction
Marital satisfaction	Relationship tension*
Marital tension*	Spouse satisfaction
Social behavior	
Angry/withdraw marital behavior*	Social support
Conflict at home*	Social undermining*
Emotional intimacy	Social withdrawal*
Family support	Spouse social support
Home support	Spouse support
Investment in intimate relationship	Stress transmission*
Marital interactions	Stress transmission at home*
Marital support to the spouse	Verbal aggression*
Positivity-marital behavior	

Note. * Concepts that were reverse coded in the meta-analysis.

(*Appendices continue*)

Appendix B

Meta-Analytic Results of the Relationships Among the Predictors and the Relationships Among the Outcomes

Relationship	k	N	$\bar{r}$	z	95% CI_L	95% CI_U	Q	I^2 (%)
Role sender's work stressors and work attitudes	5	1,013	−.16	−1.75	−.39	.09	29.06	86.24
Role sender's work stressors and WFC	12	2,298	.40	11.08	.33	.47	31.59	65.18
Role sender's work attitudes and WFC	8	2,383	−.10	−1.09	−.31	.12	123.31	94.32
Role receiver's psychological distress and work attitudes	9	1,467	−.36	−8.38	−.45	−.27	30.97	74.16
Role receiver's psychological distress and family satisfaction	10	3,091	−.33	−6.23	−.44	−.21	67.46	86.66
Role receiver's work attitudes and family satisfaction	7	1,598	.26	5.39	.14	.37	31.58	81.00

Note. k = number of independent samples; N = total sample size; $\bar{r}$ = correlation effect size; 95% CI_L and 95% CI_U = lower and upper bounds of the 95% confidence interval; Q = weighted square deviation; I^2 = proportion of true variance relative to total variance. WFC = Work-to-family conflict.

Appendix C

Meta-Analytic Results of the Relationships Among the Predictors/Outcomes and Positive Social Behavior

Relationship	k	N	$\bar{r}$	z	95% CI_L	95% CI_U	Q	I^2 (%)
Role sender's work stressors and social behavior	17	3,905	−.09	−2.80	−.17	−.02	62.14	74.25
Role sender's work attitudes and social behavior	5	1,461	.18	2.75	0	.36	21.77	81.36
Role sender's WFC and social behavior	16	4,308	−.16	−4.30	−.24	−.08	62.34	75.94
Role sender's social behavior and role receiver's psychological distress	14	4,748	−.27	−4.25	−.39	−.13	239.67	94.58
Role sender's social behavior and role receiver's family satisfaction	14	4,752	.40	10.31	.32	.47	82.15	84.17
Role sender's social behavior and role receiver's work attitudes	7	2,267	.18	3.11	.04	.32	31.77	81.11

Note. k = number of independent samples; N = total sample size; $\bar{r}$ = correlation effect size; 95% CI_L and 95% CI_U= lower and upper bounds of the 95% confidence interval; Q = weighted square deviation; I^2 = proportion of true variance relative to total variance. WFC = Work-to-family conflict.

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