PROCESSES OF STRAIN CROSSOVER BETWEEN DUAL-EARNER COUPLES

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ABSTRACT

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Many working individuals are part of a dyadic relationship (e.g., couple). Experiences of one member of the dyad are linked not only to individual outcomes but also to the partner’s outcomes. Using 330 Korean matched dual-income couples, this study investigated a phenomenon where strains due to work and family demands cross over between working spouses. Drawing upon Westman’s (2001) theory of crossover, this study supported indirect crossover mechanisms via two types of interpersonal interactions using Structural Equation Modeling analysis based on the Actor-Partner Interdependence Model. First, one’s strain was positively related to one’s own social undermining behaviors directed at his/her spouse, which in turn influenced the spouse’s strain level. Second, one’s strain was negatively related to one’s own social support behaviors toward his/her spouse, which in turn also affected the strain level of the spouse. These two indirect crossover effects were not significantly different between the two directions from husbands to wives and from wives to husbands. Thus, the gender differences in crossover were not supported. As the interdependent stress experiences between working spouses naturally occur in their relationships, current examination of strain crossover in couple dyads provides more realistic insights into stress processes. Implications and suggestions for future research are discussed.
Dedicated to my husband, my lovely two children (Yeowoon and Jaewoon) and my supportive parents and parents-in-law.

I would not have been able to finish this journey without all of you.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>CHAPTER I. Crossover Processes</strong></td>
<td>4</td>
</tr>
<tr>
<td>Difference between Spillover and Crossover</td>
<td>4</td>
</tr>
<tr>
<td>Processes of Crossover between Spouses</td>
<td>5</td>
</tr>
<tr>
<td>Direct Crossover</td>
<td>5</td>
</tr>
<tr>
<td>Common Stressor Mechanism</td>
<td>6</td>
</tr>
<tr>
<td>Indirect Crossover</td>
<td>7</td>
</tr>
<tr>
<td><strong>CHAPTER II. THE ROLE OF GENDER IN CROSSOVER</strong></td>
<td>11</td>
</tr>
<tr>
<td>Gender in Crossover</td>
<td>11</td>
</tr>
<tr>
<td><strong>CHAPTER III. METHOD</strong></td>
<td>15</td>
</tr>
<tr>
<td>Sample and Procedures</td>
<td>15</td>
</tr>
<tr>
<td>Measures</td>
<td>16</td>
</tr>
<tr>
<td>Scale Translation</td>
<td>16</td>
</tr>
<tr>
<td>Work Demands</td>
<td>17</td>
</tr>
<tr>
<td>Family Demands</td>
<td>18</td>
</tr>
<tr>
<td>Strain</td>
<td>18</td>
</tr>
<tr>
<td>Social Undermining</td>
<td>18</td>
</tr>
<tr>
<td>Social Support</td>
<td>19</td>
</tr>
<tr>
<td>Common Life Stressors</td>
<td>19</td>
</tr>
<tr>
<td>Confirmatory Factor Analysis</td>
<td>19</td>
</tr>
<tr>
<td><strong>CHAPTER IV. RESULTS</strong></td>
<td>21</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Characteristics of Participants</td>
<td>46</td>
</tr>
<tr>
<td>2</td>
<td>Means, Standard Deviations, Coefficient Alphas, Skewness, and Paired ( t ) test Results for Major Study Variables</td>
<td>47</td>
</tr>
<tr>
<td>3</td>
<td>Intercorrelations and Coefficient Alphas for Study Variables (Husbands)</td>
<td>48</td>
</tr>
<tr>
<td>4</td>
<td>Intercorrelations and Coefficient Alphas for Study Variables (Wives)</td>
<td>49</td>
</tr>
<tr>
<td>5</td>
<td>Intercorrelations for Study Variables between Husbands and Wives</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>Fit indices for the Models including the Final Model</td>
<td>51</td>
</tr>
<tr>
<td>7</td>
<td>Squared Multiple Correlations for Endogenous Variables in the Final Model</td>
<td>52</td>
</tr>
<tr>
<td>8</td>
<td>Unstandardized Parameter Estimates for Omitted Paths</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Included in the Final Model</td>
<td>53</td>
</tr>
<tr>
<td>9</td>
<td>Endogenous Cross-Partner Variables Set Free to Correlate</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>in the Final Empirical Model based on the Assumption of Shared Error</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Parameter Estimates for the Covariate, Length of Marriage Life</td>
<td>55</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>Conceptual models of crossover mechanisms</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Proposed model of strain crossover mechanisms among dual-earner couples</td>
<td>56</td>
</tr>
<tr>
<td>3</td>
<td>The Final Empirical Model</td>
<td>57</td>
</tr>
</tbody>
</table>
INTRODUCTION

Almost all working adults encounter stress in the workplace, and this often has consequences for them as individuals. However, what happens when they return home carrying their stress experiences with them? Do their stress experiences only affect themselves? These questions may be easily answered by recalling one of our days when we came home after having a bad day at work and became irritable, acting in an angry manner toward our spouse or withdrawing from sharing house work; as a result of this, the spouse’s stress may build up. This illustration points to the so called crossover phenomenon which refers to inter-individual transmission of stress by which psychological distress/strain experienced by one individual leads to psychological distress/strain of another individual in an intimate relationship (Bolger, DeLongis, Kessler, & Wethington, 1989; Westman, 2001).

Previous crossover studies have shown that a variety of strains cross over between partners including depression (Westman & Vinokur, 1998), job burnout (Westman & Etzion, 1995), physical health (Westman, Keinan, Roziner, & Benyamini, 2008), negative moods (Song, Foo, & Uy, 2008), and anxiety (Westman, Etzion, & Horovits 2004a) to just name a few. This dyadic nature of stress crossover warrants further research attention because it may cause negative reciprocal effects between spouses, resulting in a spiral of resource losses for sustaining their well-being and effective functioning at work and at home (Westman, Brough, & Kalliath, 2009). Crossover research suggests that employees’ stress originating from the workplace can further affect other members in their family (Westman et al., 2009). As such, crossover is not only an important topic for researchers but also for organizations as they try to help their employees manage their stress more effectively.
A noteworthy advancement in crossover research is Westman’s (2001) theory of three potential mechanisms of stress-strain crossover between partners in the context of work-family life: (a) direct transmission of strain where one’s strain produces an empathetic reaction in the other partner increasing the strain level of the partner, (b) spurious crossover as a result of common stressors in a shared environment (e.g., financial hardship), and (c) indirect crossover through interpersonal interactions such as hostile interactions (interpersonal interactions mediate strain crossover between partners). Figure 1 shows these conceptual crossover mechanisms by Westman (2001).

Figure 1. Conceptual models of crossover mechanisms

A. Direct crossover

B. Common stress crossover

C. Indirect crossover

Despite advances in the study of crossover effects, there are two readily recognizable research gaps in crossover research. First, the three crossover mechanisms have not been fully tested empirically, which I consider to be important in building and improving crossover theory.
Second, inconsistent findings have been observed regarding bidirectionality of crossover processes in that crossover can take place in both directions: from husbands to wives and from wives to husbands. Some studies found bidirectional crossover, whereas other studies supported only unidirectional crossover from husbands to wives (for a review, Westman, 2002). Thus, gender differences need to be tested with a sound theoretical framework.

In short, we still have a lack of knowledge with respect to the following two questions: “why does strain crossover occur between partners?” and “are working men and women affected differently by crossover?” In recognition of the research needs, the goal of the proposed study was to test the theorized crossover processes and examine if they differ among dual-earner couples as a function of gender—a largely studied individual difference in work stress research (Nelson & Burke, 2002). In the following chapters, the theoretical background and previous research findings are reviewed to build hypotheses in the study.
CHAPTER I: CROSSOVER PROCESSES

Difference between Spillover and Crossover

Most work-family researchers have focused on work-family linking mechanisms to study how the work and family domains are interconnected. Among others, employees’ work-family spillover has received a great amount of research attention. Spillover refers to a phenomenon where one’s stress experiences at work spill over to the family domain, affecting stress levels at home for the same person (Edward & Rothbard, 2000). Spillover is viewed as an *intra-individual*, inter-domain transmission of stress (Bolger et al., 1989); for example, an employee exhausted from work feels that he/she cannot fulfill family roles (e.g., parent, spouse) in the home domain due to mental and/or physical exhaustion. Work-family interface studies on spillover mostly focus on individual outcomes.

On the other hand, crossover is considered as a dyadic, *inter-individual*, inter-domain transmission of stress between closely related individuals (Bolger et al., 1989; Westman, 2001). An example can include a phenomenon where an employee’s burnout adversely affects the level of burnout of the person’s spouse. Crossover research is based on systems theory (Bronfenbrenner, 1977), which highlights that in studying individuals we must take into account the social systems they are in—obviously, the smallest system married people are embedded in is a couple dyad. In that sense, systems theory provides a useful theoretical grounding for studying crossover phenomenon at a couple level.

Spillover and crossover phenomena are not mutually exclusive, although spillover is a necessary but not a sufficient condition for crossover to occur (Westman et al., 2009). To put it differently, individuals’ stress originating from their workplace spills over to the family domain where the same individuals manifest their strains in one way or another; as a result, their strains affect levels of their spouse’ strains. Thus, it needs to demonstrate that a crossover phenomenon
is partly due to work stress spillover. In addition, work-family interface research has shown that both work domain and family domain stressors contribute to an employee’s strain level (Ford, Heinen, & Langkamer, 2007; Michel, Kotrba, Mitchelson, & Baltes, 2010). Accordingly, before hypothesizing crossover mechanisms along with gender differences, I first hypothesize that the strains working couples experience are affected by their job demands and family demands (stressors)—a known antecedent of crossover (Westman, 2001, 2006). Please refer to Figure 2 which depicts all of the hypothesized relationships in this study.

_Hypothesis 1:_ Job demands are positively related to strains of working spouses:

path 1a indicates that husband’s job demands are related to his strain, while path 1b shows that wife’s job demands are related to her strain in Figure 2.

_Hypothesis 2:_ Family demands are positively related to strains of working spouses:

path 2a indicates that husband’s family demands are related to his strain, while path 2b shows that wife’s family demands are related to her strain in Figure 2.

**Processes of Crossover between Spouses**

**Direct Crossover**

Westman (2001) proposed three processes by which strain crossover can occur between partners. First, one’s strain can affect the other partner’s strain through the partner’s direct empathetic reactions. Individuals in a close relationship tend to care for each other and have emotional relatedness. This psychological intimacy engenders empathetic responding when one’s spouse experiences stress (O’Brien, DeLongis, Pomaki, Puterman, & Zwicker, 2009); thus, a person feels the distress his/her spouse is experiencing. An experimental study on teachers,
though not using couples, confirmed the crossover of burnout from teachers to their fellow teachers through this mechanism (Bakker, Westman, Schaufeli, 2007). Other empirical studies using couples have supported the occurrence of the direct process where one person’s stress and strain directly cross over to the other spouse, such as psychological distress (Song, Foo, Uy, & Sun, 2010), work-family conflict (Westman & Etzion, 2005), perceived health (Westman et al., 2008), exhaustion (Demerouti, Bakker, & Schaufeli, 2005), burnout (Bakker, Demerouti, & Schaufeli, 2005; Westman & Etzion, 1995), and anxiety (Westman et al., 2004a). On the basis of these findings, I hypothesize a direct crossover as the following:

_Hypothesis 3:_ One’s strain is positively related to strain of the other spouse (paths 3a & 3b, respectively in Figure 2): path 3a refers to a direct crossover from husbands to wives, while path b indicates to a direct crossover from wives to husbands.

**Common Stressor Mechanism**

A common stressor process was also proposed to explain why strain crossover occurs between partners (Westman, 2001). This is also known as a spurious crossover because experiencing a common stressor in the same environment can simultaneously cause both spouses’ strains. For example, daily family hassles in the family domain (e.g., a lot of work at home, a sick child) influence both spouses’ feelings of negative emotions (Song et al., 2010). Westman and Vinokur (1998) also found that unpleasant life events common to both partners caused the crossover of each spouse’s depression. Couples’ economic hardship affected the crossover of perceived health (Westman et al., 2008). Although few researchers have actively tested this common stressor mechanism, the empirical findings described above support the occurrence of
strain crossover through a common stressor mechanism. Thus, this crossover mechanism of common life stressors is hypothesized and depicted in Figure 2 as well.

_Hypothesis 4:_ Common life stressors shared by spouses are positively related to the strain of each spouse (paths 4a & 4b, respectively in Figure 2): path 4a refers to common life stressors relating to husbands’ strain, while path 4b indicates to life stressors relating to wives’ strain.

**Indirect Crossover**

The third crossover mechanism is characterized as an indirect process in which interpersonal interactions mediate strain crossover between spouses (Westman, 2001). In other words, strain crossover can be explained by couples’ interpersonal exchanges. Among others, two types of interpersonal interactions proposed by Westman (2001) have received empirical testing for their mediating role in crossover: *spousal undermining* and *spousal social support*.

**Social undermining as an indirect process**

Vinokur and van Ryn (1993) theorized that spousal social undermining is a targeted behavior toward a spouse that consists of (1) displaying negative affect such as anger or dislike, (2) criticizing the spouse’s attributes, actions, or efforts, and (3) making the spouse’s life difficult. There is considerable research evidence that individuals who are distressed from work tend to initiate or exacerbate hostile interactions with their partners, such as yelling, criticizing, and having arguments (e.g., Bolger et al., 1989; Crouter, Perry-Jenkins, Huston, & Crawford, 1989; MacEwen, Barling, & Kelloway, 1992; Matthews, Conger, & Wickrama, 1996; Vinokur, Price, & Caplan, 1996). These negative interpersonal behaviors by an individual may operate as a
stressor for his/her spouse, resulting in an increase in the strain levels of the recipient of the undermining behaviors. Based on this reasoning, several crossover studies have empirically supported the mediating role of social undermining in strain crossover between couples (Bakker, Demerouti, & Dollard, 2008; Westman & Vinokur, 1998; Westman, Vinokur, Hamilton, & Roziner, 2004b; Westman et al., 2008). Thus, I replicated the past findings that social undermining behaviors mediate strain crossover between couples.

**Hypothesis 5:** Social undermining behaviors (perceived by a recipient) mediate the relationship between the strains of both spouses. In other words, a person’s strain is positively related to the person’s social undermining behaviors (perceived by a recipient), which in turn affect the strain of the person’s spouse (see Figure 2 with path 5a — — — — — — referring to a direction from husbands to wives and 5b — — — — — — indicating to a direction from wives to husbands).

**Social support as an indirect process**

Social support is often conceptualized as an interpersonal resource that one can utilize to meet the demands in an environment either through receiving assistance or by directly reducing the demands (House, 1981). A meta-analysis on social support in work stress showed that social support helps individuals cope with a various stressful situations (Viswesvaran, Sanchez, & Fisher, 1999). The majority of social support studies in the work stress literature have highlighted its beneficial effects on recipients’ outcomes. However, it needs to consider both aspects of providing and receiving social support to explain why social support may mediate crossover process.
With respect to social support providers, Conservation of Resource theory (Hobfoll, 1989) suggests that distressed individuals attempt to restore depleted resources; they may be more likely to withdraw from provision of social support in order to replenish resources. Also, the role scarcity perspective (cf. Marks, 1977) suggests that individuals have a limited amount of resources to spend on multiple life roles (e.g., employee, spouse, parent); therefore, working individuals with a greater strain that taxes their resources may not be able to provide sufficient social support for their spouse. For example, employees reporting a high level of workload (stressor) were more likely to withdraw from family social activities (Ilies, Schwind, Wagner, Johnson, DeRue, & Ilgen, 2007; Repetti, 1989) and were less attentive to family members (Repetti, 1987). These studies point to the possibility that one would provide a lower level of social support for their spouse when they are under stress.

When it comes to the recipients of social support, receiving inadequate social support from a spouse may be detrimental to one’s strain level in two ways. First, the lack of social support from a spouse in the family domain may suggest that more family-related demands need to be taken care of by the other spouse, which translates into more demands. Second, insufficient spousal support may indicate the lack of protective mechanism for a person to deal with his/her stress (lack of resource). A wealth of evidence in work-family research exists for the main effect of spousal support on the recipients’ well-being (e.g., Beatty, 1996; Burke & Greenglass, 1999; Hill, 2005; Michel et al., 2010).

Taken together, the indirect crossover is posited to occur via social support in that a person experiencing high strains is less likely to provide social support toward his/her spouse; and this lack of social support, in turn, would affect the spouse’s strain level. Compared to the research evidence for the mediating role of social undermining in crossover, an empirical test of
social support’s mediating role in crossover is rare, with a study by Song et al. (2010) being an exception. These researchers examined crossover of daily distress between unemployed individuals and their working spouse, but they failed to support the mediating role of marital support. They attributed the failure to a characteristic of their sample (i.e., participants from low socioeconomic status), given the past findings that beneficial effects of social support were most salient among the high and middle class, but were not present for low SES individuals. On the other hand, another recent study (Bakker, Demerouti, & Burke, 2009) showed that a person’s workaholism was related to reduced social support for a spouse, which in turn was negatively related to the spouse’s marital satisfaction. This finding suggests that social support may link the strain crossover between spouses. Accordingly, this indirect mechanism of social support in crossover warrants further investigation. Therefore, I hypothesize the following:

**Hypothesis 6:** Social support behaviors mediate the relationship between the strains of both spouses. In other words, a person’s strain will be negatively related to the provision of social support by the person (perceived by a recipient), which in turn affects the strain of the person’s spouse (see Figure 2 with path 6a ➤ referring to a direction from husbands to wives and 6b ➤ indicating to a direction from wives to husbands).
CHAPTER II: THE ROLE OF GENDER IN CROSSOVER

Gender in Crossover

As mentioned in the introduction, I now turn to the potential role of gender on stress crossover (Westman, 2001, 2002). Given the mixed findings on gender differences in crossover among dual-earner couples, determining gender effects based on theory is of particular interest. Some studies have found that the crossover phenomenon was unidirectional (only from husbands to wives). For example, Westman, Etzion, and Danon’s (2001) study using Israeli working couples found a unidirectional crossover of burnout from husbands to wives. On the other hand, Westman and Etzion (1995) found a bidirectional crossover of burnout from husbands to wives and from wives to husbands with a sample of Israeli military officers and their wives.

When it comes to crossover of marital satisfaction, a unidirectional crossover from husbands to wives was exhibited in Westman et al.’s study (2004b) based on a sample of Russian army officers and their wives. Mauno and Kinnunen (1999), however, showed a bidirectional crossover of marital satisfaction from husbands to wives and vice versa using Finnish dual-earner couples.

Additional findings of two crossover studies on unemployed individuals and their employed spouses are also inconsistent regarding gender. Westman et al. (2004a) supported a bidirectional crossover of anxiety from husbands to wives and from wives to husbands in Israel. A recent study by Song et al. (2010), however, showed that crossover of psychological distress symptoms (e.g., felt nervous, restless, depressed) differed by gender depending on the couple’s marital satisfaction. Specifically, they found a post-hoc interaction effect where the crossover of distress from husbands to wives was weaker in more satisfied marriages than in less satisfied ones in families with employed husbands. In families with employed wives, the crossover from
wives to husbands was stronger in more satisfied marriages than in less satisfied ones. Their post-hoc explanation for the moderating effect of gender was that men and women may have different goals in managing the work and home domains. In a satisfying marriage, wives may tend to integrate work and family more (e.g., bringing more work aspects into the family domain), whereas husbands may tend to separate work and family as much as possible to protect their family.

In addition to these mixed results, sample characteristics in crossover studies are hard to compare in that some studies used couples with one working spouse, whereas other studies used dual-earner couples (both working spouse). This adds to the complexity of understanding potential roles of gender in crossover because a host of other factors might have influenced the studies in one way or the other, such as employment status of husbands and wives (employed versus unemployed, full-time versus part-time work). In an effort to reduce any possible confounding influences of sample characteristics in employment status, I limit the current test of gender effects to the context of dual-earner couples (both spouses are employed full-time).

To build the hypothesis of gender differences in crossover processes, I mainly draw on stress research which has examined gender differences. Research on gendered stress reactions suggest that women respond to stress with “tend-and-befriend” tendency rather than “fight-or-flight” tendency which was originally considered as a typical stress response among human-beings regardless of gender (cf. Taylor, Klein, Lewis, Gruenewald, Gurung, & Updegraff, 2000). Taylor et al.’s (2000) theorization of gender differences in the stress response was based on an extensive review of numerous studies on biological and behavioral responses to stress. They posited that women under stress, in comparison to men, are more likely to show tending behaviors, such as nurturing and caring so that they can protect themselves and their family
members from stress. Women’s befriending responses can include forming relationships and providing social support to build or maintain social networks that they can utilize in times of difficulties. On the other hand, men are posited to be more aggressive (fight) or withdrawn (flight) than women. Although Taylor et al. (2000) recognized that men and women can show both patterns of “tend-and-befriend” and “fight-or-flight” reactions to stress, they theorized that the gender differences observed in stress research may be attributed to this dominant pattern of stress response in one gender over the other (i.e., tending-and-befriending among women, fight-or-flight among men).

In the context of a dyadic relationship, the theorization of gendered stress reactions (Taylor et al., 2000) suggests that when husbands experience stress, they may be more likely to show undermining behaviors and reduce social support provisions toward their spouse, which can be viewed as a “fight” and “flight” reaction respectively. On the contrary, wives under stress may be still more likely to provide social support and less likely to engage in undermining behaviors than men. Women’s tending behaviors (caring for family members) under stress may further lead them to be more sensitive and empathetic to their spouse’s signs of distress, resulting in greater crossover from husbands to wives. In addition, Westman (2001, 2002) suggested that women tend to have more burdens than men in terms of their role as a provider of emotional and instrumental support for their family. These burdens, in turn, may make women less resilient in dealing with their own distress because providing support may further deplete women’s psychological resources. Taken together, I hypothesize that wives are more vulnerable to crossover process than husbands; thus, the proposed crossover processes are stronger for a direction from husbands to wives than from wives to husbands.
Hypothesis 7: Gender moderates the crossover processes. Specifically, the crossover processes are stronger for the direction from husbands to wives (paths 3a, 5a, and 6a in Figure 2) than from wives to husbands (paths 3b, 5b, and 6b in Figure 2). In other words, the strengths of the paths in the crossover processes are greater for the direction from husbands to wives than the direction from wives to husbands.
CHAPTER III: METHOD

Sample and Procedures

Each paper-pencil survey packet included two small separate packets for a husband and wife. Each husband and wife packet contained a cover letter to introduce the study and ask for participation, study measures, and return envelope with a ready-strip tape to seal responses. Each member of a couple was instructed to complete the survey independently. The surveys were distributed by a group of people that the Principal Investigator knows personally in South Korea (i.e., former colleagues, friends, family members, relatives). The Principal Investigator instructed this group of people in person, so that they could distribute the surveys properly to South Korean couples who they personally knew and met the following sampling criteria: (1) the couples were in cohabiting heterosexual married relationships and (2) both members of the couples were full-time workers with a minimum of 30 work hours per week.

All paper-pencil surveys contained randomly generated code numbers to match responses of husbands and wives and ensured anonymity of their responses; thus, each participant completed an anonymous survey. Upon completion, participants were instructed to place the survey in return envelopes provided. The sealed envelopes were then returned to the distributors, who then submitted them to the researcher. A total of 360 couples were recruited to participate in the study. Among 360 couples, 20 couples were removed from the current analyses because they did not meet the aforementioned sampling criterion of working at least 30 hours per week as a full-time worker. An additional 10 couples were deleted due to missing data and careless responses.

The final sample became 330 Korean cohabiting heterosexual married couples (i.e., 660 individuals). The mean duration of marriage life was 12.72 years (SD = 8.55), and about 70% of
the couples had at least one child under 18 years old. The majority of the couples (87%) lived as a nuclear family while only 13% of them lived with their parents as an extended family. Husbands worked longer hours than wives (Men: $M = 44.65, SD = 6.59$; Women: $M = 41.96, SD = 7.30; t (318) = 5.60, p < .001$). Husbands were significantly older than wives (Men: $M = 42.09, SD = 7.50$; Women: $M = 39.33, SD = 7.29; t (324) = 20.28, p < .001$) with a higher income than wives (Men: $M = $47,000, $SD = $21,700; Women: $M = $33,000, $SD = $18,500; $t (303) = 9.91, p < .001$). Husbands’ educational levels were significantly higher with Bachelor’s degree or higher than those of their wives ($\chi^2 (1) = 17.84, p < .001$). Husbands in this sample reported working in diverse occupations and industries including service, manufacturing, construction, technology, and education to name a few. However, the majority of the wives (76.78%) reported working in service, public/government, and educational industry. Across men and women, many of the participants reported working for private companies (Men: 38%; Women: 47%). Table 1 presents more detailed information of the participants’ occupations/industries and demographic characteristics.

**Measures**

**Scale Translation**

Translation-backtranslation procedure with committee approach (Brislin, 1970, 1980) was used to translate the English-based measures of the five study variables into Korean language (i.e., work demands, family demands, strain, social undermining, social support). A total of 56 items were first translated into Korean by the Principal Investigator. Only the demographic questions and life stressor items were not back-translated\(^1\). This Korean version was then back-translated into English by three translation committee members, who were

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\(^1\) Life stressor items consisted of simple nouns which were straightforward enough to translate, so back-translation strategy was not necessary.
doctoral students in the department of Media and Communication at Bowling Green State University (BGSU) and fluent in both Korean and English. The three translators had met with the researcher after their independent translation to agree upon item translation. Seven items were deleted due to a redundant and inappropriate Korean adjective to describe the similar strain symptoms (i.e., unhappy, troubled, weak, disillusioned, energetic, rejected, worthless). Additional, two items were removed because there was no such a congruent expression in Korean language (i.e., ‘are you confronted with things that personally tough you at work?’ as to work demands and ‘how often does your housework confront you with things that touch you personally?’ as to home demands). Among a total of 47 items, 31 items (66% of the items) showed a great consistency in three versions of back-translation with almost same sentence structures and words; thus, there was no need for additional ratings for those items. Accordingly, the rest of 16 items were separately evaluated on the consistency of item meaning between the original English and back-translated English version: 3 for strains, 6 for social support, 1 for spousal undermining, 4 for work demands, and 2 for home demands. Fifteen anonymous psychology doctoral students, who were native English speakers at BGSU, rated them on a five-point scale (1 = not consistent at all, 5 = very consistent). All of the items showed a great consistency in meaning with an average rating of 4.19 (ranged from 4.00 to 4.90).

**Work Demands**

Work stressors were measured with three sub-factors of job demands by Peeters, Montgomery, Bakker, and Schaufeli (2005): quantitative job demands (four items; e.g., ‘Do you have to work very fast?’), emotional job demands (three items; e.g., ‘Is your work emotionally demanding?’), and mental job demands (four items; e.g., ‘Must you be very precise in your work?’). All items were scored on a five-point scale ranging from strongly disagree (1) to
**strongly agree (5).** Each participant self-reported on his or her own work demands. The Cronbach’s alpha was .72 (quantitative job demands), .74 (emotional demands), and .80 (mental demands) for husbands and .77, .75, and .81 for wives respectively.

**Family Demands**

Family demands were measured with home demands scale by Peeters et al. (2005). They developed home demands scale that can conceptually mirror the three sub-factors of work demands: *quantitative home demands* (three items: e.g., “Do you have to carry out a lot of tasks at home [household/caring tasks]?”); *emotional home demands* (two items: e.g., “How often do emotional issues arise at home?”); and *mental home demands* (four items: e.g., “Do you find that you have to plan and organize a lot of things in relation to your home life?”). All items were rated on a five-point scale (1 = *strongly disagree*, 5 = *strongly agree*). The Chronbach’s alpha was .84 (quantitative demands), .83 (emotional demands), and .81 (mental demands) for husbands and .89, .83, and .84 for wives respectively.

**Strain**

Each spouse self-reported how frequently he/she experiences an array of strain symptoms of burnout. Pine and Aronson’s (1988) 14 items were used on a six-point rating format (1 = *never/almost never*, 6 = *almost always/always*). Example symptoms included “being physically exhausted,” “being emotionally exhausted,” and “being weary.” The Cronbach’s alpha was .91 for husbands and .90 for wives.

**Social Undermining**

Five-item scale of partner’s undermining behaviors by Vinokur and van Ryn (1993) was used. Participants indicated how often their spouse showed undermining behaviors directed at them on a five-point scale ranging from 1 (*not at all*) to 5 (*very frequently*). Items included
“show he or she dislikes you,” “act in an angry manner toward you,” “make your life difficult,” “he or she criticizes you,” and “make you feel unwanted.” The Cronbach’s alpha was .86 for husbands and .88 for wives.

**Social Support**

Vinokur and van Ryn’s (1993) eight-item scale of spouse’s social support was used. Respondents were asked to rate on a five-point scale ranging from *not at all* (1) to *very often* (5), “how often does your spouse show the following supportive behaviors?” The example behavioral options included “provide you with encouragement,” “say things that raise your self-confidence,” and “listen to you when you need to talk.” The Cronbach’s alpha was .89 for husbands and .93 for wives.

**Common Life Stressors**

Each spouse responded to a checklist of recent 18 life events in relation to their family life (e.g., financial problems, illness or death of a family member, learning problems of children) using *yes* (1) or *no* (0) response options (Bolger et al., 1989). Only the events that both spouses endorsed to “yes” were summed up as a single score for the couples. The current couples agreed to a mean of 15 life events out of 18 events (SD = 2.21) yielding spousal agreement rate of 83%.

**Confirmatory Factor Analysis (CFA)**

CFA was conducted separately for husbands and wives to examine if the above measures except demographics and life stressors distinguish their correspondent constructs. The nine factor structure—quantitative work demands, emotional work demands, mental work demands, quantitative family demands, emotional family demands, mental family demands, strains, social undermining, and social support—showed an adequate fit to the data for both husbands and wives (Husbands: $\chi^2[998, N = 330] = 2593.31, p = .00$; ratio of $\chi^2/df = 2.60$; CFI = .93; NNFI
RMSEA = .078, \( p = .00 \); SRMR = .08; Wives: \( \chi^2 [998, N = 330] = 2660.63, p = .00 \); ratio of \( \chi^2/df = 2.67 \); CFI = .94; NNFI = .93; RMSEA = .082, \( p = .00 \); SRMR = .08). Both measurement models had all significant standardized factor loadings for husbands ranging from .48 to .90 and for wives ranging from .46 to .88.
CHAPTER IV: RESULTS

Preliminary Analyses

The descriptive statistics (i.e., means, standard deviations, skewness, coefficient alphas) for the study variables are presented in Table 2. Post-hoc paired samples t-tests were conducted to see if the means of the constructs differed between husbands and wives (see Table 1 for t-test results). Husbands reported significantly higher mental work demands than did wives (Men: $M = 4.02$, $SD = .64$; Women: $M = 3.91$, $SD = .71$; $t (329) = 2.38$, $p < .05$), but no other significant differences existed in other work demands between husbands and wives. Wives, however, reported significantly higher family demands in all three dimensions than did husbands (quantitative family demands: $t (329) = -13.08$; emotional family demands: $t (329) = -8.74$; mental family demands: $t (329) = -11.20$, all significant at $p < .001$). Wives also reported experiencing significantly higher strain ($t (329) = -3.84$, $p < .001$) and showing significantly higher spousal support behaviors ($t (329) = -1.97$, $p < .05$) and undermining behaviors ($t (329) = -2.87$, $p < .01$) toward their husbands than did their husbands.

Table 3 and Table 4 display intercorrelations among the study variables for husbands and wives respectively. Additionally, intercorrelations between husbands and wives are presented in Table 5. In Table 5, all parallel variables across men and women except quantitative family and mental family demands were significantly related each other. For example, husbands’ strain was positively related to wives’ strain ($r = .26$, $p < .01$). Significant positive relationships were also found in social undermining ($r = .39$, $p < .01$) and social support ($r = .41$, $p < .01$) between husbands and wives. Common life stressors had a positive relationship with strains for both husbands ($r = .26$, $p < .01$, Table 3) and wives ($r = .17$, $p < .01$, Table 4). All of the work and
family demands had a significant positive relationship with the strains of husbands (Table 3) and wives (Table 4).

**Analytic Strategy and Hypothesis Testing**

Because the current data is dyadic, Kashy and Kenny’s (2000) and Kenny, Kashy, and Cook’s (2006) suggestions for data analysis (actor-partner interdependence model; APIM) were followed to account for interdependence in the data by linking responses of the members of the couples with their respective spouse; therefore, the unit of analysis is not an individual, but a dyad. Structural equation modeling (SEM) with LISREL 8.8 (Jöreskog & Sörbom, 1996) was used to test the hypothesized relationships presented in Figure 2. Given that this study examines 19 variables (each 9 variables for husbands and wives, life stressor) with 94 items (each 47 indicators for husbands and wives) and one indicator of life stressor scores, modeling in SEM could be extremely complicated and result in model identification problems. Accordingly, path analysis with directly observed variables was used to test the main hypotheses.

Regarding the goodness of model fit, the nonsignificant chi-square value ($\chi^2$) is indicative of a good fit of a model, but it tends to become significant with large sample sizes. Thus, four additional fit indices were examined: (CFI; Bentler, 1990), nonnormed fit index (NNFI; Bentler & Bonett, 1980), root mean squared error of approximation (RMSEA; Browne & Cudeck, 1993), and standardized root mean square residual (SRMR). A CFI and NNFI value close to .95 or above, a RMSEA and SRMR value close to or smaller than .08 are considered to be indicative of a good model fit (Hu & Bentler, 1999). Along with the overall goodness of model fit, unstandardized path estimates (local fit) were evaluated to examine the nature and significance of the hypothesized relationships among the study variables. Kenny et al. (2006) recommended that unstandardized estimates should be reported using nonindependent dyadic data in SEM
because “standardizing coefficients separately for each dyad member type (e.g., for husbands and wives separately) renders the coefficients incomparable across dyad member type” (p. 179).

In the APIM framework, all parallel endogenous variables between husbands and wives (e.g., husbands’ social support was correlated with wives’ social support) need to set free to covary as the individuals come from the same family indicating that those parallel variables are systematically related due to their shared environment (Kenny et al., 2006). This concept is called “the assumption of shared errors” (Kenny et al., 2006). Therefore, all parallel cross-partner endogenous variables in the model were allowed to covary to account for nonindependence in the data: social support, social undermining, and strains. In addition, all exogenous variables, within and across members of the couples, were set free to covary in the model. Given that the model with a total of 20 variables including one control variable (i.e., marriage years) has its complexity and potential for systematic relationships to exist although they were not proposed, modification indices in LISREL output were carefully examined to identify good-fitting model to the data.

The initial model included 14 exogenous variables (each three for work and family demands for husbands and wives; life stressors; marriage years as a control) and 6 endogenous variables (strain, social undermining, and social support for husbands and wives). This initial model did not show an adequate fit to the data with the fit indices below the desired cut-off levels ($\chi^2 (62) = 283.89, p = .00, CFI = .92, NNFI = .77, RMSEA = .097, p < .05, SRMR = .09$) although many of the path estimates of the hypothesized relationships were supported and interpretable. The examination of modification indices suggested that freeing up eight omitted paths in the initial model could improve the model fit to the data. One of the paths was at the individual level (actor effect): wives’ mental family demands to wives’ social support behavior.
toward husbands. Seven pairs of the paths were crossover effects (partner effect): (1) one’s emotional family demands to the other partner’s social support and undermining behaviors (4 pairs), (2) husbands’ mental work demands and mental family demands to wives’ social support (2 pairs), (3) wives’ mental work demands to husbands’ social support demands (1 pair). When included these 8 paths, the revised model had a good fit to the data ($\chi^2 (54) = 84.27, p = .008$, CFI = .99, NNFI = .96, RMSEA = .04, $p = .81$, SRMR = .031). Inclusion of these paths significantly improved the model fit ($\Delta \chi^2 (8) = 199.62, p < .001$); therefore, the revised model was retained (Table 6). The results of the eight parameter estimates are separately reported on page 28 and 29 (Table 8).

Next, to test the gender differences in crossover paths (Hypothesis 7), six hypothesized paths of crossover processes were equated (or constrained to be equal) across gender: direct crossover paths, indirect crossover paths through social support and social undermining, and path of life stressors causing strain crossover. This gender-equated model also showed a good fit to the data ($\chi^2 (60) = 90.27, p = .007$, CFI = .99, NNFI = .97, RMSEA = .039, $p = .87$, SRMR = .032). However, the chi-square difference test showed that there was no significant difference between the revised model and gender-equated model, indicating no significant gender effects ($\Delta \chi^2 (6) = 6, n.s.$); therefore, Hypothesis 7 was not supported\(^2\). The rule of parsimony in the model decision-making tree by Anderson and Gerbing (1988) suggests that the constrained model should be accepted. Thus, this gender-equated model was retained instead of the revised model above.

\(^2\) I also tested this gender-equated model without marriage years as a control to examine gender differences, but the model did not improve the model fit either ($\Delta \chi^2 (6) = 7.48, n.s.$). This indicates that there was also no gender difference in the model when leaving out the control variable. Significance of other paths remained the same as the above gender-equated model with the control. However, I chose the current model including marriage years as a control because it showed a better model fit to the data.
In the gender-equated model, all the indirect crossover paths and common life stressors’ effect on strains were significant for both directions from husbands to wives and from wives to husbands. However, contrary to Hypothesis 3 stating that one’s strain would be positively related to the strain of his or her spouse, the direct crossover path was not significant (B = -.05, t = -52, n.s.); therefore, Hypothesis 3 was not supported. Accordingly, as a next step, another model was run with the direct crossover paths constrained to be zero. This constrained model also showed a good fit to the data ($\chi^2$ (61) = 91.10, $p = .008$, CFI = .99, NNFI = .97, RMSEA = .038, $p = .88$, SRMR = .033). The chi-square difference test indicated that there was no significant difference in improvement in model fit to the data ($\Delta\chi^2 (1) = .27$, n.s.); thereby, this constrained model was accepted as a final model as to the rule of parsimony (Anderson & Gerbing, 1988). All the chi-square tests and fit indices are presented in Table 6. The following sections describe the tests for the rest of the hypothesized relationships in this study.

**Work Demands and Strain**

Hypothesis 1 stated that job demands would be positively related to strains of working spouses: Path 1a indicates the relationship between husband’s job demands and his strain while Path 1b referred to the relationship between wife’s job demands and her strain. **Within husbands,** quantitative work demands and emotional work demands were positively related to their strains (for quantitative work demands: $\gamma = .18$, $p < .01$; emotional work demands: $\gamma = .24$, $p < .001$), whereas husbands’ mental work demands were not significantly related to their strains ($\gamma = .07$, $t = 1.08$, n.s.). **Within wives,** only emotional work demands were significantly related to their strains ($\gamma = .41$, $p < .01$). Note that the effect of direct crossover was in negative direction in the current gender-equated model, whereas the simple correlation of strains between men and women was positive ($r = .26$, $p < .01$). To unravel this situation, I tested a number of models in which duration of marriage life (a control variable) was removed. When I removed the marriage years from the model (with no gender-equivalency), the direct crossover effect became significant and positive direction from husbands to wives (B = .19, $t = 2.07$, $p < .05$) and from wives to husbands (B = .17, $t = 2.29$, $p < .05$). On the other hand, when I controlled for marriage years, the direct crossover path became negative, although weak and nonsignificant.
strains (γ = .13, p < .01), whereas quantitative work and mental work demands were not
significantly related to their own strains (γ = .09, t = 1.45, n.s; γ = .07, t = 1.11, n.s. respectively).
As a result, Hypothesis 1 was partially supported.

**Family Demands and Strain**

Hypothesis 2 stated that family demands would be positively related to strains of working
spouses: Path 2a indicates the relationship between husband’s family demands and his strain
while Path 2b referred to the relationship between wife’s family demands and her strain.
Hypothesis 2 was partially supported in that only emotional family demands were
significantly related to strain for both husbands and wives (Husbands: γ = .16, p < .01; Wives: γ = .32, p
< .001). Quantitative family demands (Husbands: γ = .06, t = 1.06, n.s.; Wives: γ = -.01, t = -.18,
n.s) and mental family demands (Husbands: γ = -.12, t = -1.77, n.s.; Wives: γ = .03, t = .37, n.s.)
were not significantly related to strains for both husbands and wives.

**Common Life Stressors and Indirect Crossover Paths**

Hypothesis 4 stated that common life stressors would be positively related to the strain of
each spouse. This path was significant (γ = .05, p < .01) supporting Hypothesis 4. However, the
crossover effects of common life stressors occurred through indirect processes given the
nonsignificant direct crossover path.

Hypothesis 5 indicated that social undermining would mediate the relationship between
the strains of both spouses. In other words, a person’s strain would be positively related to the
person’s undermining behaviors toward his/her spouse, which in turn would be positively related
to the strain of the person’s spouse. These paths were significant from one’s strain to
undermining (B = .14, p < .001) and from the person’s undermining to the spouse’s strain (B
Constraining these paths significantly worsened the model fit to the data ($\Delta \chi^2(2) = 27.17, p < .01$), therefore, Hypothesis 5 was supported (Table 6).

Hypothesis 6 indicated that social support behavior would mediate the relationship between the strains of both spouses. In other words, a person’s strain would be negatively related to the person’s support toward his/her spouse, which in turn would be negatively related to the strain of the person’s spouse. These paths were also significant from one’s strain to the person’s social support ($B = -.17, p < .001$) and from the person’s support to the spouse’s strain ($B = -.07, p < .05$). Constraining these paths significantly worsened the model fit to the data ($\Delta \chi^2(2) = 20.72, p < .01$), therefore, Hypothesis 6 was supported (Table 6). For partial mediation to occur in dyadic data, the direct path should be significant, but this was not the case in the current data indicating complete mediation (Ledermann & Macho, 2009). The total indirect effect through social undermining and social support was also significant ($-.03, p < .01$).

**Squared Multiple Correlations**

The final model yielded squared multiple correlations for the endogenous variables ranging from $.17$ (social support for husbands) to $.38$ (strains for wives). For husbands, the model explained $30\%$ of the variance in strain, $24\%$ in undermining, and $17\%$ in social support. For wives, the model explained $38\%$ of the variance in strain, $19\%$ in undermining, and $21\%$ in social support (Table 7). Parameter estimates ($\psi$) between corresponding endogenous variables between husbands and wives are presented in Table 9. Table 10 displays parameter estimates for the covariate, length of marriage life on page 56.

**Retained Omitted Paths (Exploratory Relationships)**

Along with the hypothesized paths included in the final model, 8 pairs of omitted paths that were not initially proposed as part of the model were retained in the final empirical model.
These paths were estimated in the final model to account for misfit between the theoretical model and the data, not just because of the modification indices, but also because they were theoretically interpretable. Husbands’ mental work demands, for instance, predicted wives’ social support toward husbands ($\gamma = .16, p < .01$). Conversely, wives’ mental work demands also predicted husbands’ social support toward wives ($\gamma = .23, p < .001$). This theoretically makes sense that in marital relationships one is more likely or expected to provide support for his/her spouse when the spouse has work demands. Although they were empirically supported and theoretically interpretable, these paths were not hypothesized and therefore should remain as exploratory in nature. Table 8 reported all of the eight parameter estimates for these paths, but Figure 3 did not include these paths for simplicity.
CHAPTER V: DISCUSSION

This study tested Westman’s (2001) theory of strain crossover processes and examined whether the processes are different across working husbands and wives. The study contributed to current literature and theory of crossover processes among dual-income couples by testing interpersonal crossover processes of spousal social support and undermining behaviors, which had not been tested in tandem in one study. In addition, the study employed a matched couple sample with full-time work status to remove possible confounds of full-time and part-time work status unlike other previous crossover studies. This sample characteristic enabled a more valid test of gender differences in the bidirectional strain crossover from husbands to wives and vice versa despite its nonsignificant finding. The major findings of this study are discussed in the next separate subsections (sources of strains, crossover processes, gender differences) followed by theoretical and practical implications.

Sources of Strains

Within husbands, quantitative and emotional work demands were found to contribute to strain levels. Within wives, emotional work demands were the only significant predictor of strains, which may have been due to the large number of women worked in service, public service, and education industry (76%) in this sample. Nonsignificant relationships between mental work demands and strains for men and women might have been due to multicollinearity among three dimensions of work demands ($r = .51, p < .01$ for husbands; $r = .58, p < .01$ for wives; between mental and quantitative work demands). Another possibility is that mental work demands might have been perceived as challenges rather than stressors (cf. Podsakoff, LePine, & LePine, 2007).
With regards to family demands, emotional family demands were the only significant predictor of strains within both husbands and wives, suggesting that emotional problems or issues at home were the major family stressors for the current married couples. Although not all dimensions of work and family demands were significant predictors of strain, the findings suggest that both work and family demands operated as stressors affecting the strain levels of working couples.

**Crossover Processes**

One notable contribution of this study is its test of all three mechanisms of strain crossover that Westman (2001) proposed. First, direct crossover of strains can occur in married couples as one could feel his/her partner’s strain given their psychological intimacy (O’Brien et al., 2009; Westman, 2001). Although previous studies found the direct crossover effects (e.g., Demerouti et al., 2005), the current result did not support this direct crossover mechanism for strains. One possible explanation for this nonsignificance is that the married couples in this sample might not have been sensitive to their spouse’ strains unless their partner’s strains are manifested through interpersonal behaviors in their marital relationships. This directs to the next discussion points for the interpersonal processes of crossover.

The indirect crossover mechanisms through interpersonal interactions (i.e., social undermining, social support behaviors) were found in this study. In other words, when individuals experience strains due to work and family stressors, they become less available for providing social support toward their spouse. This reduction in social support then negatively influences the strains of the other spouse. As mentioned in the introduction section, there was one previous study that failed to support the indirect crossover mechanism via support behaviors among married couples with unemployed spouses (Song et al., 2010). They attributed the
nonsignificant finding to their participants’ low socioeconomic status drawing upon past findings that the effects of social support were more evident among the high and middle SES rather than low SES. It is also possible that their nonsignificance of social support might have been due to different employment status within couples (one spouse was a full-time employee, whereas the other spouse was unemployed). In contrast, the current study supported this indirect crossover via social support using full-time working couples. Given that the current sample had a relatively diverse income and educational backgrounds (37% less than college degree, 63% Bachelor’s degree or higher) with a median household income of $74,700 (ranging from $22,000 to $250,000), the present findings support the indirect effects of strain crossover through social support within married couples that Westman (2001) proposed.

In addition, this study found that when individuals were stressed they were more likely to behave in an angry manner, hinder the goal attainment of their spouse, and display negative affect such as dislike toward their spouse. In turn, these undermining behaviors aggravated the strain level of the other spouse. This finding is also consistent with family research findings in that negative interactions provoking conflicts among couples were apparent when they were under stress (e.g., Schaefer, Coyne, & Lazarus, 1981). The common life stressors also affected each spouse’s strain levels. However, this study did not support that common life stressors led to direct strain crossover given the nonsignificant direct crossover paths; rather, common life stressors in this study affected one’s strain levels, which in turn crossed over to the other spouse via the two interpersonal interactions. In sum, the current findings provided support for Westman’s (2001) theory of indirect crossover mechanisms through interpersonal interactions within dual-earner couples.
Gender Differences

The aforementioned crossover paths were not significantly different across husbands and wives in contrast to the expectation for a moderating role of gender in crossover processes based on the gendered patterns of stress reactions (Taylor et al., 2000). Even though the current study ensured that all participants had a full-time work status to remove possible confounds of work status that previous crossover studies had, gender differences did not exist in the study. Despite the nonsignificance, wives in this study reported higher levels of strains, family demands, and social support than did their husbands (see paired t-test results in Table 2). This is line with the notion that women tend to have more burdens than men as a support provider for their family (Westman, 2001, 2002).

Interestingly, wives in this sample also exhibited a higher level of social undermining behaviors toward their spouse than did their husbands contrary to Taylor et al.’s “befriending” reactions to stress (2001). There were some studies found that women tend to confront and vent anger toward their spouses as a behavioral response to stress (e.g., Christensen & Heavey, 1990; Notarious & Johnson, 1982). This suggests that wives in the present sample did not exactly follow Taylor et al.’s gendered patterns of stress reactions. No particular research in Korea indicates that Korean working wives tend to show more spousal undermining behaviors than their husbands, but I speculate that this might have been due to less traditional gender role ideology that the wives may have held (e.g., egalitarian gender role ideology) given their full-time work status in this study. However, the present study cannot confirm this speculation because gender role ideology was not measured as it was beyond the scope of this study. If future studies incorporate gender role theory and actually measure them to test gender differences in crossover processes, it would be a fruitful avenue to build knowledge on the roles
of individual differences in crossover. As far as I know from the literature review, it seems that no study of crossover processes has incorporated a measure of gender role ideology.

**Theoretical Implications**

Based on the aforementioned findings, this study suggests that strained individuals may lack the resources to provide support for their spouse and self-regulate their own negative interactional behaviors. Conservation of Resources theory (Hobfoll, 1989) posits that strained individuals try to replenish depleted resources. Thus, when an individual is already strained, providing emotional comfort and self-regulating their hostile behaviors toward his/her partner may indicate that the person has to further tax on the already depleted resource to do them. Or stressed individuals may simply be less capable of giving sufficient support and restricting themselves form undermining behaviors. This is congruent with other findings in stress research (e.g., Ilies et al., 2008; Repetti, 1989; 1987) in that stressed individuals were less likely to be attentive to their family members and more likely to withdraw from family social behaviors.

From the perspective of recipients of social support and undermining, receiving insufficient support and unfavorable treatment from a spouse can aggravate one’s strain level, which in turn reduces his/her own social support and increases undermining behaviors toward the other spouse. Note that the current study examined the reciprocal crossover paths, suggesting that there can be a vicious cycle where this negative feedback loop continues within working couples. This reciprocal nature of stress crossover suggests that a spiral of resource losses in working couple dyads can be further exacerbated. Although not in the context of married couples, Andersson and Pearson (1999) suggested that poor interpersonal treatments between individuals can be amplified through a negative spiral. However, the extant literature tells us very little about possible ways to break this negative cycle.
One potential approach to narrow this research gap could be studying positive crossover phenomenon along with negative crossover as recent researchers have suggested that positive crossover can also occur in close relationships (Westman et al., 2009). For example, one’s positive psychological involvement in work (work engagement) has been recently found to crossover among Japanese working couples (Bakker, Demerouti, Shimazu, Shimada, & Kawakami, 2011). Studying positive crossover in working couples can be an important future direction because positive exchanges between working spouses may have stronger effects on positive aspects of well-being and their positive functioning in the workplace (DeLongist, Capreol, Holtzman, O’Brien, & Campbell, 2004; Westman et al., 2009). Additionally, positive crossover may wash out the negative influences of stress crossover. Thus, future crossover research should incorporate both positive and negative crossover processes to examine if their processes are similar, unique, or interactive.

In addition, not much is known about boundary conditions for crossover occurrences. For example, the crossover mechanisms may be moderated by one’s extraversion or agreeableness since it has been shown that employees’ extraversion and agreeableness were positively related to giving and receiving non-job related support (Bowling, Beehr, & Swader, 2005). It may be possible that highly extraverted and agreeable individuals experience less strain crossover because they may be better at garnering and providing non-work related support. It is very rare that individual difference factors, such as personality or coping strategies, are examined as a moderator in crossover research (Westman, 2001; 2006). This might be because modeling both partners’ individual difference factors along with reciprocal crossover paths is complex, but researchers should not be discouraged to advance theories in crossover phenomenon. Studying boundary conditions for negative crossover will enrich the theory of crossover.
Practical Implications

The present findings on strain crossover suggest that organizations should acknowledge this phenomenon and take it into account when developing intervention strategies for employees’ stress management. For example, the majority of employees’ stress interventions focused on stress at the individual level, such as stress management training for employees, training on individual coping strategies, and introducing relaxation methods in the workplace (see Richardson & Rothstein, 2008 for a review). Organizations may want to consider stress interventions targeting for couple dyads, such as Couples Coping Enhancement Training in the workplace (e.g., Schaer, Bodenmann, & Klink, 2008). CCET has been found to be an effective training on the systematic-transactional coping approach in couples that Bodenmann developed (2005). This approach acknowledges the fact that working individuals live and function in a dyadic relationship. In addition, recent occupational health psychologists found that employee training on recovery activities can be beneficial for employees’ recovery from job stress (Hahn, Binnewies, Sonnentag, & Mojza, 2011), so if this type of training could be introduced at the couple level, this may be an option for couples’ recovery from stress to break the vicious cycle of strain crossover.

The sources of couples’ strain not just came from work stress but also family stress (family demands) in the present study. The work-family literature also suggests that family stressors lead to family-to-work conflict which has been found to be an important predictor of well-being among employees (Ford et al., 2007; Michel et al., 2010). Peeters et al. (2005) also commented “companies are usually quite ready to provide work related training and support to employees, but maybe it is time that organizations also try to provide training and support for nonwork-related demands” (e.g., parental training, role reorientation for couples) (p.58).
Therefore, organizations should proactively encompass work and nonwork stressors into their stress intervention or prevention programs to have comprehensive stress interventions for working couples, so that their employees can sustain well-being for productive work days.

**Limitations**

One of the limitations of this study is its cross-sectional design which does not allow causal inferences. Although the hypothesized relationships and interpretation of the results in this study are based on a priori theory and theoretical justification, it is imperative that future studies should employ longitudinal designs to confirm the relationships. For example, is working individuals’ daily stress experience transmitted to their spouse through the same mechanisms on a daily basis? Do the current relationships hold for a longer term? There is one recent study that did not find crossover effect of work-family conflict over one year (Kinnunen, Feldt, Mauno, & Rantanen, 2010), so they suggested that future researchers should use different time lags to test reciprocal crossover.

A second limitation is the use of only observed variables in SEM path analysis. The major strength of SEM is to model measurement errors into a structural model. However, due to potential identification problems to estimate measurement and structural models simultaneously with a relatively small sample size to the sheer number of indicators and constructs in this study, I opted to use Path Analysis with observed variables rather than latent constructs with indicators. However, the measurement properties in this study (i.e., CFA, internal reliability) were in good standing.

Another weakness concerns for the convenient sample of this study. There was no systematic way to keep track of an exact response and drop-out rate or detect any self-selection bias. The current respondents might have agreed to answer the survey because the topic might
have been attractive to them. Next, self-report questionnaires were mainly used for this study which may raise concerns for common method bias; however, spousal reports on the two mediators were used in this study: social support and social undermining. Additionally, the external validity of the findings among Korean couples may not be generalized to working couples in other countries. For example, the current Korean sample did not support the direct crossover pattern, which may suggest that the hypothesized crossover mechanisms may not apply equally across cultures. However, the present Korean sample has a diverse demographic background in age (for men: range = 27 to 64; for women: range = 22 to 61), socioeconomic status, and occupations/industries. Nevertheless, future research should employ systematic data collection methods and test the present model to other samples of dual-income couples.

Conclusions

Despite the limitations, this is one of the first studies to simultaneously test crossover mechanisms via two types of interpersonal behaviors among full-time employed couples. Based on the present findings of reciprocal nature of stress experiences, I call for future studies that can examine potential ways to break the negative cycle of stress crossover in dual-income families. Knowledge about interdependent stress processes can provide more realistic insights into potentially effective stress interventions that can help workers sustain healthy and productive functioning in both work and nonwork lives.
REFERENCES


Table 1. Characteristics of Participants (N = 330 Couples)

<table>
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<tr>
<th>Demographic</th>
<th>Men</th>
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<tr>
<td></td>
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<td>SD</td>
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<td>Public, government &amp; education</td>
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<tr>
<td>Others</td>
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<td>11.93</td>
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<sup>a</sup> The numbers do not add up to the total sample size because of occasionally missing data.  
<sup>b</sup> Paired \(t\) test.
Table 2. Means, Standard Deviations, Coefficient Alphas, Skewness, and Paired t test Results for Major Study Variables

<table>
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<tr>
<th></th>
<th>Men</th>
<th></th>
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<th></th>
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<td>α</td>
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<td>SD</td>
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<td>.68</td>
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<td>329</td>
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<td>4. Quantitative home demand</td>
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<td>.84</td>
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<td>5. Emotional home demand</td>
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<td>.83</td>
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<td>.89</td>
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<td>.75</td>
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<td>.92</td>
<td>.89</td>
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<td>.73</td>
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Note. N = 330. Possible range is 1 to 5 for the above variables except strain with a possible range from 1 to 6.

* p < .05, ** p < .01, *** p < .001
Table 3. Intercorrelations and Coefficient Alphas for Major Study Variables (*Husbands*)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1.</th>
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<th>7.</th>
<th>8.</th>
<th>9.</th>
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<tr>
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<td>(.72)</td>
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<tr>
<td>2. Emotional work demands</td>
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<td>(.74)</td>
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<tr>
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<td>.11*</td>
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<td>.02</td>
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<td>-.08</td>
<td>.06</td>
<td>.05</td>
<td>-.24**</td>
<td>.02</td>
<td>-.16**</td>
<td>-.48**</td>
<td>(.89)</td>
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<tr>
<td>10. Life stressors</td>
<td>.12*</td>
<td>.14*</td>
<td>.08</td>
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<td>.16**</td>
<td>.17*</td>
<td>.26**</td>
<td>.16**</td>
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*Note.* $n = 330$. Reliability coefficients are presented in parentheses along the diagonal.

** $p < 0.05$; ** $p < 0.01$
Table 4. Intercorrelations and Coefficient Alphas for Major Study Variables (*Wives*)

<table>
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<th>Variable</th>
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<th>8.</th>
<th>9.</th>
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</tr>
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<td>2. Emotional work demands&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>(.75)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mental work demands&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.58&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.41&lt;sup&gt;**&lt;/sup&gt;</td>
<td>(.81)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>4. Quantitative family demands&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.33&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.06</td>
<td>.21&lt;sup&gt;**&lt;/sup&gt;</td>
<td>(.89)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Emotional family demands&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.21&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.24&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.11&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.46&lt;sup&gt;**&lt;/sup&gt;</td>
<td>(.83)</td>
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</tr>
<tr>
<td>6. Mental family demands&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.35&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.14&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.29&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.71&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.55&lt;sup&gt;**&lt;/sup&gt;</td>
<td>(.84)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Strain&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.28&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.34&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.23&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.28&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.55&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.36&lt;sup&gt;**&lt;/sup&gt;</td>
<td>(.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Social undermining&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.12&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.13&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.12&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.18&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.34&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.21&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.29&lt;sup&gt;**&lt;/sup&gt;</td>
<td>(.88)</td>
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<tr>
<td>9. Social support&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>.04</td>
<td>-.01</td>
<td>-.29&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-.02</td>
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<td>(.93)</td>
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<td>.08</td>
<td>.16&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.17&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.16&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-.04</td>
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</table>

*Note. n = 330. Reliability coefficients are presented in parentheses along the diagonal.*

** p < 0.05; ** p < 0.01
Table 5. Intercorrelations for Study Variables between Husbands and Wives

<table>
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<tr>
<th>Variables</th>
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<td>.09</td>
<td>.08</td>
<td>.10</td>
</tr>
<tr>
<td>2. Emotional work demands (men)</td>
<td>.16**</td>
<td>.13*</td>
<td>.22**</td>
<td>.07</td>
<td>.16**</td>
<td>.11</td>
<td>.15**</td>
<td>.19**</td>
<td>-.02</td>
</tr>
<tr>
<td>3. Mental work demands (men)</td>
<td>.23**</td>
<td>.11*</td>
<td>.31**</td>
<td>.18**</td>
<td>.05</td>
<td>.22**</td>
<td>.02</td>
<td>.02</td>
<td>.15**</td>
</tr>
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<td>4. Quantitative family demands (men)</td>
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<td>-.01</td>
<td>.07</td>
<td>.09</td>
<td>.04</td>
<td>.03</td>
<td>.20**</td>
<td>-.02</td>
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<td>5. Emotional family demands (men)</td>
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<td>.12*</td>
<td>.06</td>
<td>.14*</td>
<td>.41**</td>
<td>.16**</td>
<td>.25**</td>
<td>.44**</td>
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<td>6. Mental family demands (men)</td>
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<td>.04</td>
<td>.09</td>
<td>.17**</td>
<td>.09</td>
<td>.03</td>
<td>.21**</td>
<td>-.03</td>
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<td>7. Strain (men)</td>
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<td>.04</td>
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<td>.14*</td>
<td>.26**</td>
<td>.28**</td>
<td>-.20**</td>
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<tr>
<td>8. Social undermining (men)</td>
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<td>.12*</td>
<td>.03</td>
<td>.25**</td>
<td>.48**</td>
<td>.32**</td>
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<td>-.29**</td>
</tr>
<tr>
<td>9. Social support (men)</td>
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<td>.03</td>
<td>.15**</td>
<td>-.13*</td>
<td>-.38**</td>
<td>-.15**</td>
<td>-.25**</td>
<td>-.26**</td>
<td>.41**</td>
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</table>

Note. N = 330 couples. The bolded correlation coefficients indicate correlations between all parallel variables between men and women.

* p < .05, ** p < .01.
Table 6. Fit indices for the Models including the Final Model, $N = 330$ couples

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<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>Comparison</th>
<th>$\Delta\chi^2$</th>
<th>df</th>
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<td>1. Initial Model</td>
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<td>.097</td>
<td>.090</td>
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<td>2. Revised Model</td>
<td>84.27</td>
<td>54</td>
<td>.99</td>
<td>.96</td>
<td>.040</td>
<td>.031</td>
<td>2 vs. 1</td>
<td>199.62**</td>
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<tr>
<td>3. Gender-equated Model</td>
<td>90.27</td>
<td>60</td>
<td>.99</td>
<td>.97</td>
<td>.039</td>
<td>.032</td>
<td>3 vs. 2</td>
<td>6.00</td>
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</tr>
<tr>
<td>4. Without crossover via social undermining</td>
<td>118.27</td>
<td>63</td>
<td>.98</td>
<td>.94</td>
<td>.051</td>
<td>.046</td>
<td>6 vs. 4</td>
<td>27.17**</td>
<td>2</td>
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<tr>
<td>5. Without crossover via Social support</td>
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<td>63</td>
<td>.98</td>
<td>.95</td>
<td>.048</td>
<td>.042</td>
<td>6 vs. 5</td>
<td>20.72**</td>
<td>2</td>
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<td>6. Final Model</td>
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<td>61</td>
<td>.99</td>
<td>.97</td>
<td>.038</td>
<td>.033</td>
<td>6 vs. 3</td>
<td>.27</td>
<td>1</td>
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*Note.* $** p < .01.$
Table 7. Squared Multiple Correlations for Endogenous Variables in the Final Model

<table>
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<th>Endogenous Variables</th>
<th>Squared Multiple Correlations for Husbands</th>
<th>Squared Multiple Correlations for Wives</th>
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<tr>
<td>Strains</td>
<td>.30</td>
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<td>Social undermining</td>
<td>.24</td>
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<tr>
<td>Social support</td>
<td>.17</td>
<td>.21</td>
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Table 8. Unstandardized Parameter Estimates for Omitted Paths Included in the Final Model

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<th>Predictor</th>
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<th>Estimates ($\gamma$)</th>
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<tbody>
<tr>
<td>Wives’ mental family demands $\rightarrow$ Wives’ social support</td>
<td></td>
<td>.10$^\dagger$</td>
</tr>
<tr>
<td>Wives’ emotional family demands $\rightarrow$ Husbands’ social undermining</td>
<td></td>
<td>.35***</td>
</tr>
<tr>
<td>Wives’ emotional family demands $\rightarrow$ Husbands’ social support</td>
<td></td>
<td>-.36***</td>
</tr>
<tr>
<td>Wives’ mental work demands $\rightarrow$ Husbands’ social support</td>
<td></td>
<td>.23**</td>
</tr>
<tr>
<td>Husbands’ emotional family demands $\rightarrow$ Wives’ social undermining</td>
<td></td>
<td>.36***</td>
</tr>
<tr>
<td>Husbands’ emotional family demands $\rightarrow$ Wives’ social support</td>
<td></td>
<td>-.44***</td>
</tr>
<tr>
<td>Husbands’ mental family demands $\rightarrow$ Wives’ social support</td>
<td></td>
<td>.15**</td>
</tr>
<tr>
<td>Husbands’ mental work demands $\rightarrow$ Wives’ social support</td>
<td></td>
<td>.16**</td>
</tr>
</tbody>
</table>

$^\dagger p < .10, \ ^* p < .05, \ ^{**} p < .01, \ ^{***} p < .001.$
Table 9. Endogenous Cross-Partner Variables Set Free to Correlate in the Final Empirical Model based on the Assumption of Shared Error

<table>
<thead>
<tr>
<th>Husbands</th>
<th>Wives</th>
<th>Estimates (ψ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strains</td>
<td>Strains</td>
<td>.03†</td>
</tr>
<tr>
<td>Social undermining</td>
<td>Social undermining</td>
<td>.08**</td>
</tr>
<tr>
<td>Social support</td>
<td>Social support</td>
<td>.15***</td>
</tr>
</tbody>
</table>

† $p < .10$, ** $p < .01$, *** $p < .001$. 
Table 10. Parameter Estimates for the Covariate, Length of Marriage Life

<table>
<thead>
<tr>
<th>Variable</th>
<th>Years in marriage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strains for husbands</td>
<td>-.01**</td>
</tr>
<tr>
<td>Social undermining for husbands</td>
<td>.01***</td>
</tr>
<tr>
<td>Social support for husbands</td>
<td>-.01*</td>
</tr>
<tr>
<td>Strains for wives</td>
<td>-.01†</td>
</tr>
<tr>
<td>Social undermining for wives</td>
<td>.00</td>
</tr>
<tr>
<td>Social support for wives</td>
<td>.00</td>
</tr>
</tbody>
</table>

*Note.* While the relationships were estimated in the final path model, these parameter estimates are not reported in Figure 3 to facilitate the presentation of the final model.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. 
Figure 2. Proposed model of strain crossover mechanisms among dual-earner couples.

Note. The dotted line (-----→) represents a crossover direction from wives to husbands, and the discontinuous line (---→) represents a crossover direction from husbands to wives.
Figure 3. The Final Empirical Model

Note. Dotted lines represent nonsignificant paths, whereas solid lines represent significant paths. Eight omitted paths from exogenous to endogenous variables in this figure are presented in Table 8. Correlations (ψ) between endogenous variables are presented in Table 9. Path estimates for the indirect crossover via undermining and support remain the same for the direction from wives to husbands.
APPENDIX A. INSTRUMENTS IN ENGLISH FOR MAJOR STUDY VARIABLES

Burnout (Pine & Aronson, 1988)
Please indicate how frequently you experience the following stress-related occurrences.
1. Being tired
2. feeling depressed
3. having a good day ®
4. being physically exhausted
5. being emotionally exhausted
6. being happy ®
7. being "wiped out"
8. "can't take it anymore"
9. feeling run-down
10. feeling trapped
11. being weary
12. feeling hopeless
13. feeling optimistic ®
14. feeling anxious

Work demands (Peeters et al., 2005)
Please indicate your agreement about your work.
1. Do you have to work very fast?
2. Do you have to work very hard?
3. Does your job require a great deal of work to be done?
4. Do you feel there is not enough time for you to finish your work?
5. Is your work emotionally demanding?
6. Do you have to deal with demanding clients (e.g., customers, patients, students/parents, vendors/suppliers)?
7. Do you have to deal with clients who don’t treat you with the appropriate respect and politeness?
8. Must you be very precise in your work?
9. Do you have to concentrate all the time to watch for things going wrong?
10. Does your work need your undivided attention?
11. Do you have to keep track of more than one process at once?

Family demands (Peeters et al., 2005)
1. Do you find that you're busy at home
2. Do you have to do many things in a hurry when you are at home?
3. Do you have to carry out a lot of tasks at home (household/caring tasks)?
4. How often emotional issues arise at home?
5. How often do you get frustrated about things concerning your home-life?
6. Do you find that you have to plan and organize a lot of things in relation to your home life?
7. Do you have to remember a lot of things with regard to your home life?
8. Do you have to do many things simultaneously at home?
9. Do you have to coordinate everything carefully at home?
Life stressors (Bolger et al. 1989)

Does each of the following event happen to you recently? (Yes, No)
1. Death of close family member
2. Financial difficulties or problems
3. Illness or injuries of close family member
4. Your illness or injuries
5. Learning problem of children
6. Change in living conditions
7. Change in residence
8. Son or daughter leaving home (due to marriage, college, etc)
9. Change in number of family get-together
10. Family discord with family-in-law
11. Minor violations of the law
12. Change in eating habits
13. Major change in sleeping habits
14. Change in recreation
15. Your or your spouse’s job insecurity
16. Your or your spouse’s Pregnancy
17. New born baby
18. Foreclosure of mortgage or loan

Spousal Social support (Vinokur & van Ryn, 1993)

How often does your spouse…?
1. provide you with encouragement
2. provide you with useful information
3. say things that raise your self-confidence
4. listen to you when you need to talk
5. show that he/she cares about you as a person
6. understand the way you think and feel about things
7. provide you with direct help, that is do or give you things you need
8. how much you talk with him/her when you are upset, nervous, depressed about something

Spousal Social undermining (Vinokur & van Ryn, 1993)

How often does your spouse …?
1. act in an unpleasant or angry manner toward you
2. make your life difficult
3. show he/she dislikes you
4. make you feel unwanted
5. criticize you
May 26, 2011

TO: YoungAh Park
Psychology

FROM: Hillary Harms, Ph.D.
HSRB Administrator

RE: HSRB Project No.: H11D264GE7

TITLE: Processes of Strain Crossover between Dual-Earner Couples

You have met the conditions for approval for your project involving human subjects. As of May 25, 2011, your project has been granted final approval by the Human Subjects Review Board (HSRB). This approval expires on May 18, 2012. You may proceed with subject recruitment and data collection.

The final approved version of the consent document(s) is attached. Consistent with federal OHRP guidance to IRBs, the consent document(s) bearing the HSRB approval/expiration date stamp is the only valid version and you must use copies of the date-stamped document(s) in obtaining consent from research subjects.

You are responsible to conduct the study as approved by the HSRB and to use only approved forms. If you seek to make any changes in your project activities or procedures, send a request for modifications to the HSRB via this office. Those changes must be approved by the HSRB prior to their implementation.

You have been approved to enroll 1000 participants. If you want to enroll additional participants you must seek approval from the HSRB.

Good luck with your work. Let me know if this office or the HSRB can be of assistance as your project proceeds.

Comments/Modifications:
Please add text equivalent to the BGSU HSRB approval/expiration date stamp to the “footer” area of the consent forms (see attached for specific text).

Stamped original Korean version consent form is coming to you via campus mail.

Comment: You have made a good faith effort to obtain approval from participating companies and the HSRB realizes that you must obtain approval from them in person. You must fax the HSRB a formal approval letter from participating companies before you begin to recruit participants from those companies.
Dear participant,

I’m YoungAh Park, a doctoral student at Bowling Green State University in the United States, studying Industrial-Organizational psychology to enhance employees’ well-being and job performance.

Purpose of the Study:
This study examines stress experiences and stress management among dual-income couples. The purpose of this study is to help organizations and psychology practitioners develop appropriate stress interventions to promote well-being of dual-earner couples. Thus, I would like to collect survey responses from both spouses in a married couple.

Eligibility and Procedures for participation:
* You must be a current full-time employed worker over 18 years old. Part-time or unemployed workers are not eligible for the study. You must be a spouse of a heterosexual married couple who live in the same residence.
* Your participation will involve completing an anonymous survey, which will take about 20 minutes.
* Please fill out this survey independent of your spouse. Please do not discuss the survey items with your spouse while you answer them.
* After completing the survey, please seal your responses into the return envelope.

Benefits of participation:
This study may benefit working couples if the study results encourage the Korean organizations and practitioners to develop interventions for reducing working couples’ stress management.

Anticipated risks of participation:
The risks associated with participation in this study are no greater than those you would experience in your normal daily life.

Voluntary participation and ability to withdraw from the study:
Your participation in this study is completely voluntary, and you can refrain from answering any questions without penalty or explanation. You are free to withdraw consent and to discontinue participation in this study at any time. Your decision to participate, or not participate, will have no effect on your relationship with your employer, your spouse’s employer or your spouse. Submission of completed survey will indicate to your consent to participate.

Confidentiality:
All the information you provide will remain anonymous. Only the research will have access to the data which will be stored in a password-protected file on a computer in a locked office. Results will be presented only in summary and aggregate manner.

Contact information:
If you have any questions about this research you may contact Youngah Park in the Department of Psychology at Bowling Green State University by phone (419.372.4305) or by e-mail (ypark@bgsu.edu) or you may contact Dr. Steve M. Jex of the Department of Psychology at Bowling Green State University by phone (419.372.2301) or by e-mail (sjex@bgsu.edu). If you have any questions or concerns about rights as a research participant, contact the Chair of Bowling Green State University’s Human Subjects Review Board, at 419.372.7716 (hsrb@bgnet.bgsu.edu).

Thank you again for your participation. I appreciate your willingness to help with this research!