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Mood Spillover and Crossover Among Dual-Earner Couples:

A Cell Phone Event Sampling Study

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Abstract

This study examined affective experiences of dual-earner couples. More specifically, it explored how momentary moods can spill over between work and family and cross over from one spouse to another. Fifty couples used their cell phones to provide reports of their momentary moods over eight consecutive days. Results showed significant spillover and crossover effects for both positive and negative moods. Work orientation moderated negative mood spillover from work to home, and the presence of children in the family decreased negative mood crossover between spouses. Crossover was observed when spouses were physically together and when the time interval between the spouses' reports was short. This study contributes to the work and family research by examining the nature of mood transfers among dual-earner couples including the direction, valence, and moderators of these transfers across work and family domains. The study also contributes to the event sampling methodology by introducing a new method of using cell phones to collect momentary data.

Keywords: mood, spillover, crossover, dual-earner couples, cell phone

Mood Spillover and Crossover Among Dual-Earner Couples:

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Affective experiences are essential components of our work and family lives. Studies have demonstrated significant relationships between moods – defined as "transient episodes of feeling or affect" (Watson, 2000, p. 4) – and work and family outcomes such as work stressors (Jones & Fletcher, 1996), job satisfaction (Fisher, 2000; Judge & Ilies, 2004), marital satisfaction (Heller & Watson, 2005), work performance (Fisher, 2002) and daily stress (Marco & Suls, 1993). Since the work and family domains are interconnected (Burke & Greenglass, 1987; Voydanoff, 1988; Zedeck, 1992), mood transfer across these domains and between different family members is a critical phenomenon of the work-family interface (Bolger, Delongis, Kessler, & Wethington, 1989; Eckenrode & Gore, 1990; Larson & Almeida, 1999). This study examines the nature of work and family mood transfers among dual-earner couples including the direction, valence, and moderators of these transfers.

The transfer of moods can be categorized along two dimensions: domain and person (Demerouti, Bakker, & Schaufeli, 2005; Eckenrode & Gore, 1990; Larson & Almeida, 1999). In other words, affective experiences can flow from one life domain to another (spillover) or from one person to another (crossover). Spillover theory suggests that a person's work experiences can carry over into the home, and vice-versa, that home experiences can influence an individual's performance at work (Crouter, 1984; Piotrkowski, 1979; Zedeck, 1992). Crossover occurs when experiences of one member of a dyad (i.e., one spouse) are transferred to the other (Westman, 2001). Crossover between spouses usually takes place within the family domain, and

the magnitude of crossover indicates the congruence of the spouses' affective experiences. While spillover is an inter-domain, intraindividual phenomenon, crossover is an interindividual, intra-domain occurrence (Westman, 2005). Studying mood transfer in the forms of spillover and crossover can improve our understanding on how the family system functions and how individuals set their psychological boundaries between their work and family domains and with respect to their spouses (Larson & Almeida, 1999).

A great deal of evidence points to the interdependence of work and non-work experiences of dual-earner couples (e.g., Doumas, Margolin, & John, 2005; Larson & Richards, 1994). Nonetheless, and even though dual-earner couples form a significant proportion of households (Blossfeld & Drobnic, 2001), previous work-family studies have in the main neglected the experiences of the other spouse. In the current study, we respond to the call by Parasuraman and Greenhaus (2002) to study the psychological experiences of dual-earner couples jointly, using the lens of spillover and crossover. In addressing the limited research on individual difference factors in the work-family area (Parasuraman & Greenhaus, 2002), we examine how work and family orientations, as individual difference factors, moderate mood transfer between domains. Also, we examine how mood crossover between spouses could be contingent on situational factors such as whether the two are physically together and whether they have children. We surveyed 50 dual-earner couples during different occasions within a day for eight consecutive days via their cell phones. This methodology enabled us to more precisely address the time sensitive mood transfers.

Spillover Effects

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Work and home are two of the most important domains in a person's life, making it natural that experiences in the two should be interconnected (Kanter, 1977). Different hypotheses have been proposed to describe the relationship between these two domains, with the key differentiating factor being the assumed permeability of work-family boundaries (Zedeck, 1992). Some researchers argue that experiences in the work and nonwork domains offset each other, such that particular rewards can be achieved in one domain while being denied in the other; thus an inverse relationship between the two spheres of life should be expected (Rice, Near, & Hunt, 1980). Yet other researchers suggest that the experiences in the two domains are separate and mutually exclusive, and that no significant relationship should be expected between them (Rice et al., 1980).

However, studies in work-family experiences suggest that individuals carry affects and attitudes from their work environment into their home life (Kelly & Voydanoff, 1985; Piotrkowski, 1979) and vice-versa (Belsky, Perry-Jenkins, & Crouter, 1985; Crouter, 1984). Spillover is characterized by a positive relationship between experiences in the work and home domains. It indicates continuity of affective experience across boundaries of different life domains. In general, studies with cross-sectional designs and longitudinal designs with limited time waves (e.g., Aryee, Srinivas, & Tan, 2005; Grandey, Cordeiro, & Crouter, 2005; Mauno & Kinnunen, 1999; Staines, 1980) support the spillover hypothesis.

Studies that have examined daily mood spillover (e.g., Judge & Ilies, 2004; Matjasko & Feldman, 2006; Williams & Alliger, 1994; Williams, Suls, Alliger, Learner, & Wan, 1991) have reported mixed findings in terms of the magnitude and direction of spillover effects across

different moods (positive or negative) and domains (work to home or home to work). Given the limitations of previous studies and contradictory findings reported in the existing literature, we deemed it meaningful to examine both work-to-family and family-to-work mood spillover effects. Based on the premise that the domains of work and family are interrelated, we hypothesize:

H1: Both positive and negative moods will spill over from work to family and from

family to work.

Spillover is the mood transfer within a person but across domains. The process is likely influenced by individual difference factors, such as role identities associated with different life domains. According to the identity theory, individuals differ in the degree of importance they attach to career and family roles (Stryker & Burke, 2000). Helmreich and Spence (1978) distinguished between work and family orientations, with a high work orientation meaning that work is critical to the individual's self-identity and a high family orientation suggesting that family fills this role. Individuals high in work orientation deeply value their time at work, take greatest satisfaction in a job well done, and find it important to perform better in their tasks than others, while family-oriented individuals focus more on the family and care about their partners' careers (Helmreich & Spence, 1978).

Ashforth, Kreiner, and Fugate (2000) suggested that a strong identification with one particular social role leads individuals to integrate that role with their other social roles. The role boundary is thus more permeable for that identified role compared to other roles, and a high identification with a particular role may debilitate the process of role exit (Williams & Alliger,

1994). Role identification may thus influence the transition from work to home and vice versa (Ashforth et al., 2000). In other words, individuals with a strong work orientation may not be able to put aside work-related issues even when at home. Likewise, a strong family orientation may indicate that individuals have trouble laying aside home-related experiences, resulting in spillover of home-related moods to the workplace. Thus, we hypothesize that:

H2: Family-to-work mood spillover will be stronger when the family orientation is high rather than low.

H3: Work-to-family mood spillover will be stronger when the work orientation is high rather than low.

Crossover Effects

Crossover effects involve a dyadic process whereby an individual "catches" the affect of another person (Westman & Etzion, 1995). This phenomenon is particularly salient among people in close relationships, such as married couples, because the key feature of a close relationship is that one partner has the capacity to influence affect, cognition and behavior of the other partner (Rusbult & Van Lange, 1996). Emotional contagion occurs when individuals are influenced by the emotions displayed by those around them (Hatfield, Cacioppo, & Rapson, 1994), as observation of another person's facial, postural, or vocal expressions elicits congruent feelings within the observer (Barsade, 2002; Neumann & Strack, 2000).

Crossover is a between-individual phenomenon. Transient situational factors associated with each social interaction episode may influence the process. In particular, the physical contiguity of spouses is likely a condition for crossover to happen. Crossover of moods between spouses can

occur as they talk or do household tasks together, or simply by virtue of their sharing the same space (Larson & Richards, 1994). Also, the contagion effects of exposure to spouses' moods would diminish over time, such that a significant crossover effect would be detected only when the time interval between the spouses' reports was short. Such elapsed-time effects have been detected in some studies that have used ESM reports (e.g., Larson & Gillman, 1999), where the dissipation of moods between data points weakened the path coefficients among them. We thus proposed the following hypotheses:

H4a: There will be a significant relationship between positive (negative) moods of the working spouses when they are physically together.

H4b: The crossover of positive (negative) moods between working spouses will weaken as time elapses.

Besides transient factors, stable family situational factors may also influence the mood crossover between spouses. For the current study, we examined how the presence of children at home affected the crossover of moods between spouses. Affective crossover studies indicates that parents are in a position to exert influence on their children (Almeida, Wethington, & Chandler, 1999; Christensen & Margolin, 1988; Larson & Almeida, 1999; Larson & Gillman, 1999) Despite being less powerful, however, children can also influence the affective experiences of their parents (Larson & Richards, 1994). For the current study, we examined whether having children would affect the crossover of moods between spouses. The literature suggests several ways in which the presence of children could reduce mood crossover. First, having children at home requires couples to take on additional roles and responsibilities, which

could shift the spouses' attention from each other. Second, spouses with children may be less likely to be in physical proximity. Economic studies (e.g., Barnet-Verzat, Pailhé, & Solaz, 2005; Hallberg, 2003) have reported that couples with children spend less common leisure time together; and that while such couples may spend more time at home, they are more likely to be engaged in different domestic tasks (e.g., one will cook while the other helps with homework) (Barnet-Verzat et al., 2005). Third, the presence of children may dictate particular behavior patterns of couples, whereby parents attempt to avoid exchanges that might transmit negative moods. Such negative exchanges could be interpreted as signaling conflict and distress in the family, leading the children to experience stress, anxiety, and aggression (Grych & Fincham, 1990).

For these reasons, we hypothesize that:

H5: The crossover of moods between working spouses will be weakened when there are children in the family.

Methods

Sample

Participants consisted of full-time employees recruited from a business school in Singapore, and their spouses. Email invitations were sent to all employees, about 230 in total (the emails emphasized that participation was voluntary). Fifty-one couples who met the eligibility criterion (both spouses working) agreed to participate in the study. One couple dropped out in the middle of the study, leaving 50 couples in the final sample. Most participants employed at the business school were women (43 out of 50). The average age of participants was 37.17 years (*SD* = 7.57).

Approximately 25% of the participants (including both spouses) had post-graduate degrees, while 26% had bachelor's degrees. A majority of the participants (about 75%) were of Chinese ancestry, while the rest were Malays (20%) and Indians (5%). The average length of marriage was 10.84 years ($SD = 7.57$). Thirty-seven families had at least one child at home while the rest had no children. The average number of children living at home was 1.4 ($SD = 1.04$). In terms of participants' occupations, 6 of the 50 participants employed at the business school were lecturers, while the rest were administrative staff. Their spouses held various occupations, mainly managerial (e.g., managers and supervisors; 60% of spouses) and professional (e.g., engineers and systems analysts; 26% of spouses).

ESM Survey via Cell Phone WAP

The study examined within-day affect transmission processes using the event sampling method (ESM). ESM involves repeated data collection whereby participants provide reports of their experiences at particular moments during their everyday lives over a given span of time (Scollon, Kim-Prieto, & Diener, 2003; Zohar, Tzischinski, & Epstein, 2003). Our study used the WAP (Wireless Application Protocol) application function of cell phones to conduct the survey. WAP is a standardized protocol that enables mobile devices (including mobile phones) to access internet or other applications (Vos & de Klein, 2002). The WAP survey programmed by Java language was downloaded to cell phones through wireless networks. The survey could then be opened at any time and responses could be sent out automatically as an SMS (Short Message Service) to the server. The responses were time-stamped, allowing for accurate recording of the time the responses were received. Figure 1 shows two sample screenshots of the survey used in

the study.

Procedures

Participants recruited from the business school received 15-20 minutes of individualized coaching in downloading and completing the survey. They were requested to coach their spouses on how to complete the cell phone survey at home. All participants were required to undergo a day of test trail before the formal survey period to ensure that they could properly use the cell phone survey method. Both spouses completed a comprehensive baseline paper-and-pencil survey on demographic information, trait affectivity and work/family orientation. They were then asked to carry their cell phones at all times and to complete the cell phone survey several times daily for eight consecutive days. During each working day, the participants received 4 SMS reminders during 4 time periods (early morning, late morning, afternoon and late evening). During the weekend, they received 3 reminders during all periods except the early morning. The survey was designed to be short enough to be completed within two minutes. Couples were compensated with 100 Singapore dollars (about 60 US dollars) for their participation.

We sent out 2,980 SMS reminders and received 2,563 reports, yielding a response rate of 86.2%. On average, each participant provided 9.85 (ranging from 1-19) reports at work and 15.78 (ranging from 7-20) reports outside work. The number of responses per couple ranged from 9-29 (at work) and 18-41 (outside work).

Measures

Moods. Moods were assessed using items from the Positive and Negative Affect Schedule

(PANAS, Watson, Clark, & Tellegen, 1988). We used a shorter version with 10 items—5 for positive moods (enthusiastic, interested, determined, excited, inspired), and 5 for negative moods (upset, irritable, scared, ashamed, jittery). Positive mood items were chosen based on the items with the 5 highest factor loadings in Watson et al.'s (1988) study. Negative mood items were chosen by using the item with the highest factor loading within each of 5 categories or *triads* (cf. Watson et al., 1988). Participants were asked to enter a number ranging from 1 (*not at all*) to 5 (*extremely*) to estimate the extent to which the item described their momentary mood. Our shortened measure and the original 20-item PANAS (measured in Time 1 using the baseline-paper-and-pencil survey) were highly correlated (.91 and .93 for PA and NA, respectively), indicating good convergent validity for the shortened version. The alpha coefficient estimations for positive moods and negative moods were .93 and .70, respectively.

Time gap. Time gaps for surveys between spouses were calculated based on the time stamps of the received responses from both spouses. The time gap was defined as the absolute value of the time interval (scaled in 100 minutes to facilitate interpretation of results) between responses of spouses for the same period.

Family and work orientations. Family orientation and work orientation were measured via the baseline paper-and-pencil survey using four items from the 5-item career identity salience inventory of Lobel and St. Clair (1992), originally developed by Lodahl and Kejner (1965). Although Lobel and St. Clair (1992) defined and measured career identity salience as a unidimensional construct with high family orientation as indication of low career orientation, more recent conceptualization of role identities distinguish work and family orientations as

independent constructs (Rothbard & Edwards, 2003). Our confirmatory factor analyses also demonstrated that a two-factor model with 4 items differentiating between family and work orientations led to a better fit than the single-factor model[1]. Two items each served for the family orientation ("The major satisfactions in my life come from my family" and "The most important things that happen to me involve my family") and work orientation ("The major satisfactions in my life come from my job" and "The most important things that happen to me involve my job") sub-scales. Participants rated the statements using a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree).* The alpha coefficients for family and work orientations were .67 and .61, respectively.

Trait Positive Affect (PA) and Trait Negative Affect (NA). In this study, we controlled for the effects of trait positive affect and trait negative affect, as positively-disposed individuals have been found to be more easily affected by positive events, while negatively-disposed individuals are more sensitive to negative stimuli (Judge & Ilies, 2004; Larsen & Ketelaar, 1989). We used the Positive and Negative Affect Schedule (Watson et al., 1988) with general instructions (e.g., "Please indicate to what extent you *generally* feel this way"). Each affectivity scale had 10 items. The alpha reliability estimations for trait PA and NA were .84 and .81, respectively.

We also asked participants in the time 1 baseline survey to report how many children in the family. The variable *"have children"* was coded as 1 if there was at least 1child and 0 if there was no child in the family.

Results

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[1] Detailed model fit information can be obtained from the first author upon request.

Table 1 displays the correlation matrix of the study variables. Figure 2 illustrates the average trends of moods within a day across 8 days for wives and husbands. In general, participants experienced more positive moods (M=12.51) than negative moods (M=6.65), t(2562) =54.54, p<.01 – a finding consistent with those from other studies (e.g., Egloff, Tausch, Kohlmann, & Krohne, 1995; Watson et al., 1988). The findings concur with the conclusion of Watson (2000) that the affective life of normal people is in general pleasant rather than unpleasant. Tables 2 to 6 show the results of the hypothesis testing. Since for each individual there were multiple observations over time, mixed models (also known as Hierarchical Linear Models or Multilevel Random Coefficient Models) were used to test all hypotheses. For all models, only the intercept was assumed to be random, and a two-level variance structure (individual and repeated measure) was adopted[2]. Mood predictors were individual-mean centered (Hofmann, 1997). The xtmixed command in Stata version 9 was used to run mixed regression models (see Rabe-Hesketh & Skrondal, 2005, for an introduction to this command).

Tables 2 and 3 show results related to spillover effects. To test Hypothesis 1, mood in one domain (work or family) was regressed on the same mood in the other domain (family or work) from the previous period. We observed significant spillover effects for both positive (β = .10, p<.05) and negative moods (β = .23, p<.01) from home to work and for both positive (β = .25, p<.01) and negative moods (β = .12, p<.05) from work to home. Thus, Hypothesis 1 was fully supported.

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[2] More complex models with random slopes and an additional couple-level variance structure generated similar fixed effect estimations. We adopted simpler model specifications for the sake of parsimony.

There was no evidence of significant moderating effects for family orientation on family-to-work spillover ($\beta = .07$, *ns* for positive mood and $\beta = .09$, *ns* for negative mood), so Hypothesis 2 was not supported. However, we found that work orientation significantly moderated the spillover of negative affect from work to home ($\beta = .10$, p<.01). Specifically, those who were high in work orientation were more likely to experience negative work-to-home mood spillover than those low in work orientation (see Figure 3). We did not find similar moderating effects for positive mood spillover ($\beta = .04$, *ns*). Hence, Hypothesis 3 was only partially supported.

Tables 4 and 5 show results related to crossover effects of positive and negative moods. We performed separate analyses for occasions when spouses reported they were together and for times when they were apart. We found significant relationships for both positive ($\beta = .10$, p<.01) and negative moods ($\beta = .22$, p<.01) when both spouses were physically together (Model 1 in Table 4 and Model 6 in Table 5). No crossover was found for neither positive mood ($\beta = -.02$, *ns*) nor negative mood ($\beta = .06$, *ns*) when spouses reported they were not together (Tables 4 and 5). Thus, Hypothesis 4a was fully supported.

For occasions when both spouses reported they were physically together, we further examined response time gap effects by using two analytic strategies. First, we included an interaction term of time gap and momentary moods in the equations (Model 2 in Table 4 and Model 6 in Table 5). The interaction was negative and significant for positive mood crossover ($\beta = -.23$, p<.01), which suggests that crossover of positive moods between spouses decreased as the gap between their responses grew. The interaction was also negative but not significant

for negative mood crossover (β =-.07, *ns*).

Results from Garret and Madock's study (2001) suggest that the decrease in intensity of subjective affective experiences takes the form of a sharp drop followed by a slow decay. Given this possible nonlinear time effect, we further supplemented the above analysis with subgroup regressions by dichotomizing time gaps between responses for each couple. There were significant crossover effects for both positive (β =.21, p<.01) and negative moods (β = -.37, p<.01) when spouses' reports were made less than 10 minutes apart (Model 3 and Model 8, respectively), No significant crossover for positive (β =.02, *ns*) and negative moods (β = .05, *ns*) was demonstrated when the time gap was more than 10 minutes (Model 4 and Model 9, respectively). Thus, the two analytic strategies yielded support for time gap effects on mood crossover as stated in Hypothesis 4b.

The moderating effect of having children in the family on crossover of moods is presented in Model 5 (Table 4) and Model 10 (Table 5). We failed to find a significant moderating effect on the crossover of positive moods (β =-.09, *ns*). However, the moderating effect on negative mood crossover (β =-.22, p<.01) was supported. Results indicate that participants with children experienced weaker crossover of negative moods than those without. Thus Hypothesis 5 was partially supported. Figure 4 provides an illustration of the moderating effect of having children in the family.

Discussion

The present study examines the nature of work and family mood transfers among dual-earner couples through the lens of spillover and crossover. Mood transfer is particularly

relevant given the effects of moods on work and family outcomes (Fisher, 2002; Heller & Watson, 2005). Compared with previous studies that yielded mixed findings (e.g., Williams & Alliger, 1994), our results demonstrate consistent mood transfer effects across different types (spillover and crossover), moods (positive and negative), and directions (from work and family and from family to work). These results highlight the permeability of individuals' psychological boundaries and underscore the interconnections of affective experiences from different life situations and across different individuals.

Our result suggests that those with a stronger work orientation are more likely to bring home their negative affective experiences from work. Previous studies (e.g., Lobel & St. Clair, 1992; Major, Klein, & Ehrhart, 2002) have demonstrated that people with a stronger career identity spend more time in the workplace and put more effort into their jobs than their peers with a weaker career identity, and also receive more salary increases. The current study shows a potential downside of a stronger career identity, in its potential to seep into the domain of family life. The fact that moods from one's work domain can spillover to his/her family domain, especially for individuals high in work orientation, sends a message to individuals high in work-orientation for the need to make a conscious effort to draw a clearer line between work and family experiences in order that work moods do not unnecessarily affect experiences at home. Physical exercise and taking a short time to compose oneself before leaving the office have been suggested as ways to dissipate negative work affect (Larson & Richards, 1994). Employers can also implement workplace policies such as flextime to facilitate the segmentation of the employees' work and family roles (Rothbard, 2005), not to mention that the

cost of flextime programs for organizations has been minimal (Zedeck & Mosier, 1990). It is also critical for employers to build a family-friendly workplace culture to reduce the spillover of negative affect from work to home for their employees (Mennino, Rubin, & Brayfield, 2005).

Our findings regarding crossover effects support the assertion that crossover can be observed most readily when spouses are physically together, and that mood crossover effects have a relatively short lifespan. Compared with the significant spillover effects we observed, for which the mean time elapsed between consecutive observations was about 4 hours, crossover effects were not found when spouses' reports were made more than 10 minutes apart. The different durations for spillover and crossover effects could imply that different regulatory mechanisms govern the dynamics of these two effects. One possibility is that there is a difference between the roles of sender and receiver. Because the events that trigger a given mood may be more salient to the sender than to the receiver, the former may sustain the mood longer than the latter. The transitory feature of momentary mood crossover may suggest that it is relatively easy to reduce the detrimental influence of negative mood crossover. It might be a helpful strategy to set some time alone to think and decompress even just for a brief moment to prevent the spreading of his/her negative mood to other family members. However, the results of the current study do not discount the importance of mood crossover. The accumulation of "small incidences" such as daily mood crossover may influence "bigger issues" such as marriage quality. Studies have shown that couples with poorer marital relationship exhibit more affective contagion, particularly of negative affect, than those with better relationship (e.g.,

Larson & Richards, 1994). Future studies might examine how marriage quality affects mood crossover duration and how mood crossover duration affects marriage quality.

Also noteworthy are our results suggesting that having children in the family weakens the crossover of negative moods between parents. The significant moderating effect of having children on the crossover of negative moods suggests that even though parents are the nexus of the family, other family members can influence their interaction patterns. In addition, the fact that we found significant moderating effect for negative but not for positive moods lends support to the idea that having children leads parents to restrain their expressions of negative affect without the need to restrain their expressions of positive affect. However, it is also possible that parents divert some of their attention toward their children, and are thus less likely to be influenced by the bad mood of their spouses. These two very different explanations can be tested by differentiating between the role of sender and receiver in future studies. Future studies are also encouraged to further examine how the affective experiences of children are related to those of their parents.

To our knowledge, our study is one of the first to use the new mobile technology, WAP, to conduct an ESM survey. The new method has the advantages of enabling time stamps, offering real-time monitoring. Wireless technology has already been used for various purposes in the medical arena, such as collecting quality-of-life data (Bieli et al., 2004) and remote monitoring of heart signals (Tachakra, Wang, Istepanian, & Song, 2003). The current study demonstrates the promise of this technology in management and psychological research. A recent report demonstrated that the electronic method (hand-held computers) and paper-and-pencil method

generate very similar response patterns (Green, Rafaeli, Bolger, Shrout, & Reis, 2006). To establish its validity, it is critical to also compare the new cell phone survey method to traditional methods in terms of the accuracy of responses, participant compliance, and the subjective experience of survey respondents.

Two possible limitations of our study arise from our sample's relatively small size and relative lack of diversity. Future studies employing a larger sample size and drawing participants from more diverse occupational and organizational backgrounds would be beneficial, especially in enabling between-individual effects of occupation and gender. Additional limitations are related to the use of ESM. While the use of ESM offers a number of virtues, it is not without drawbacks. A possible concern is that familiarity with the survey items can cause sensitization to the research variables and even boredom, influencing the survey responses. However, studies have shown that these effects are not significant (Eckenrode & Bolger, 1995; Shiffman & Stone, 1998). In addition, ESM designs do not provide the degree of control found in experimental studies, thus limiting causal inferences.

In sum, we used mood spillover and crossover as tools in the current study to show the interplay between affective influences at work and at home as experienced by dual-earner couples. We hope this study will encourage researchers to conduct more rigorous, in-situ examination of affective flow processes as they occur in different life domains and among different individuals.

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Table 1
Means, Standard Deviations and Correlations among All Study Variables

Variable	Mean	SD	1	2	3	4	5	6	7
1. Sex (1=male, 2=female)	1.50	0.50	--						
2. Positive affect	32.60	5.69	.06	--					
3. Negative affect	18.70	4.87	.03	.08	--				
4. Family orientation	8.36	1.01	.04	.02	.18	--			
5. Work orientation	6.43	1.46	.17	.06	-.19	.09	--		
6. Average positive mood	12.51	5.05	-.14	.29	.11	.09	-.03	--	
7. Average negative mood	6.65	2.33	-.11	.03	.49	.10	-.05	.23	--

N=100. Variables 5 to 8 are averaged momentary assessments. The underlined correlation coefficients are significant at the .05 level.

Table 2
Spillover of Moods from Home to Work

Variable	Positive mood at work		Negative mood at work	
	Step 1	Step 2	Step 1	Step 2
Positive affect	.20 (.08)**	.20 (.08)**		
Positive mood at home	.10 (.05)*	.10 (.05)*		
Negative affect			.21 (.04)**	.20 (.04)**
Negative mood at home			.23 (.05)**	.22 (.05)**
Family orientation		.09 (.43)		.19 (.18)
Positive mood at home× Family orientation		.07 (.05)		
Negative mood at home× Family orientation				.09 (.07)
Log likelihood	-1150.90	-1149.87	-916.54	-915.25

Notes. N=439. The regression coefficients are unstandardized and their corresponding standard deviation estimations are in parentheses. All mood predictors were individual-mean centered. The models controlled for possible time effects by including a day index and two within-day time indexes.

* $p<0.05$; ** $p<0.01$

Table 3
Spillover of Moods from Work to Home

Variable	Positive mood at home		Negative mood at home	
	Step 1	Step 2	Step 1	Step 2
Positive affect	.25 (.08)**	.25 (.08)**		
Positive mood at work	.25 (.06)**	.26 (.06)**		
Negative affect			.15 (.03)**	.15 (.03)**
Negative mood at work			.12 (.06)*	.13 (.06)**
Work orientation		-.06 (.32)		-.02 (.10)
Positive mood at work × Work orientation		.04 (.04)		
Negative mood at work× Work orientation				.10 (.04)**
Log likelihood	-979.99	-979.29	-709.98	-706.84

Notes. N=358. The regression coefficients are unstandardized and their corresponding standard deviation estimations are in parentheses. All mood predictors were individual-mean centered. The models controlled for possible time effects by including a day index and two within-day time indexes.

* $p < 0.05$; ** $p < 0.01$

Table 4
Crossover of Positive Moods Between Spouses

	Positive mood of wife					
	Couple physically together					Couple not physically together
	Model 1	Model 2	Model 3	Model 4	Model 5	
PA of husband	.07 (.08)	.07 (.08)	.07 (.09)	.10 (.08)	.09 (.08)	-.01 (.09)
Positive mood of husband	.10 (.05)*	.15 (.05)**	.21 (.06)**	.02 (.08)	.16 (.09)	-.02 (.04)
Time gap		.24 (.15)				
Have children					1.41 (1.18)	
Positive mood of husband × Time gap		-.23 (.09)**				
Positive mood of husband × Having children					-.09 (.11)	
N	493	493	247	246	493	640
Log likelihood	-1327.03	-1323.37	-654.24	-682.88	-1325.99	-1737.41

Notes: The regression coefficients are unstandardized and their corresponding standard deviation estimations are in parentheses. All mood predictors were individual-mean centered. The models controlled for possible time effects by including a day index and three within-day time indexes. Model 1 examined the main effects of PA and momentary mood. Model 2 examined the moderating effect of time gaps between surveys of couples. Model 3 examined effects of PA and momentary mood for observations with time gaps smaller than 10 minutes. Model 4 examined effects of PA and momentary mood for observations with time gaps equal to or greater than 10 minutes. Model 5 examined the moderating effect of having children.
* p<0.05; ** p<0.01

Table 5
Crossover of Negative Moods Between Spouses

	Negative mood of wife					
	Couple physically together					Couple not physically together
	Model 6	Model 7	Model 8	Model 9	Model 10	
NA of husband	.07 (.04)*	.07 (.04)*	.07 (.04)*	.08 (.04)	.07 (.04)*	.07 (.04)
Negative mood of husband	.22 (.04)**	.25 (.05)**	.37 (.06)**	.05 (.07)	.35 (.07)**	.06 (.04)
Time gap		.02 (.08)				
Have children					.07 (.43)	
Negative mood of husband × Time gap		-.07 (.04)				
Negative mood of husband × Having children					-.22 (.09)**	
N	493	493	247	246	493	640
Log likelihood	-958.16	-956.60	-467.69	-495.61	-954.96	-1262.70

Notes: The regression coefficients are unstandardized and their corresponding standard deviation estimations are in parentheses. All mood predictors were individual-mean centered. The models controlled for possible time effects by including a day index and three within-day time indexes. Model 6 examined the main effects of NA and momentary mood. Model 7 examined the moderating effect of time gaps between surveys of couples. Model 8 examined effects of NA and momentary mood for observations with time gaps smaller than 10 minutes. Model 9 examined effects of NA and momentary mood for observations with time gaps equal to or greater than 10 minutes. Model 10 examined the moderating effect of having children.
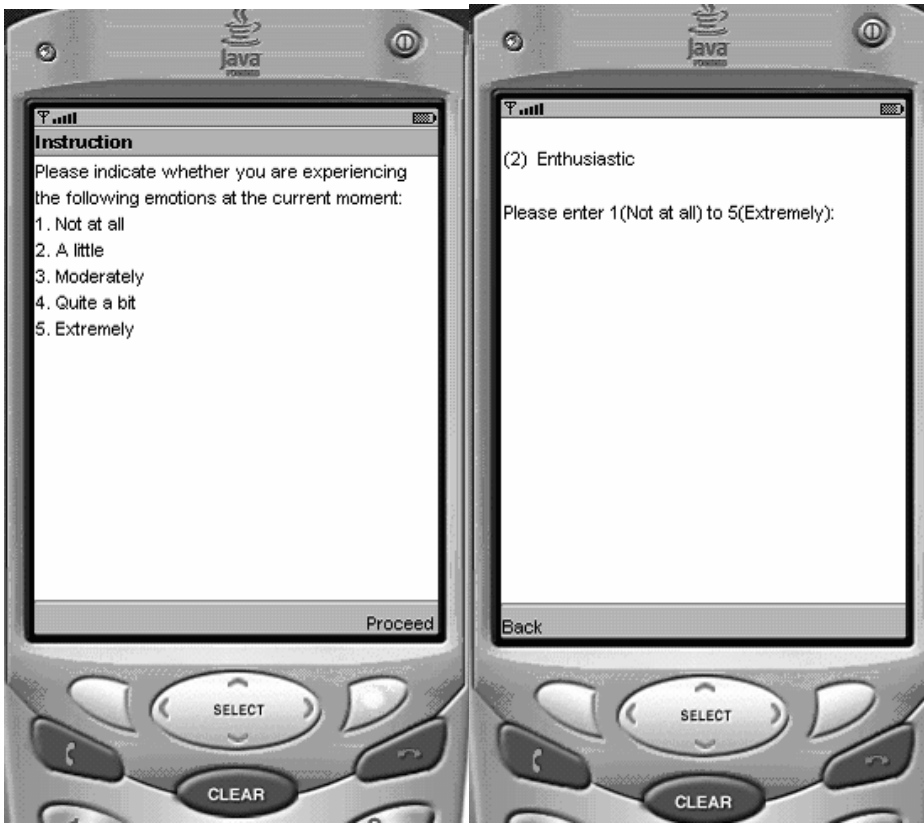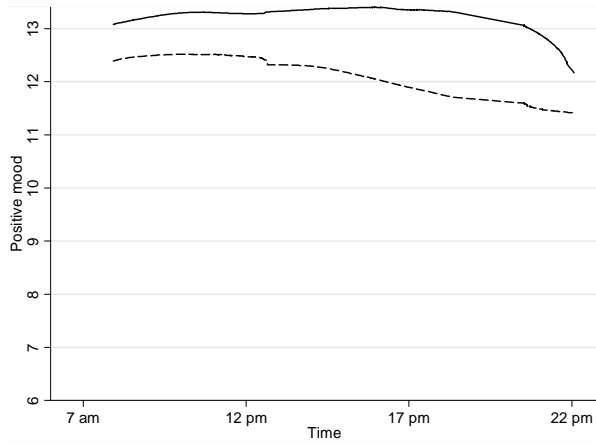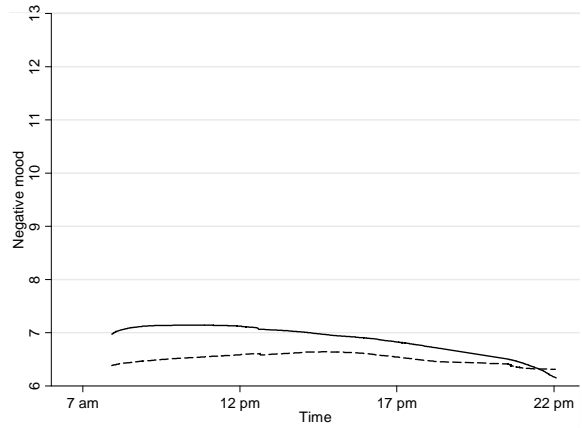* $p<0.05$; ** $p<0.01$

Figure 1
Two Sample Screenshots of the Cell Phone WAP Survey

(a) Positive mood   (b) Negative mood

Figure 2

Trends of Average Moods within a Day

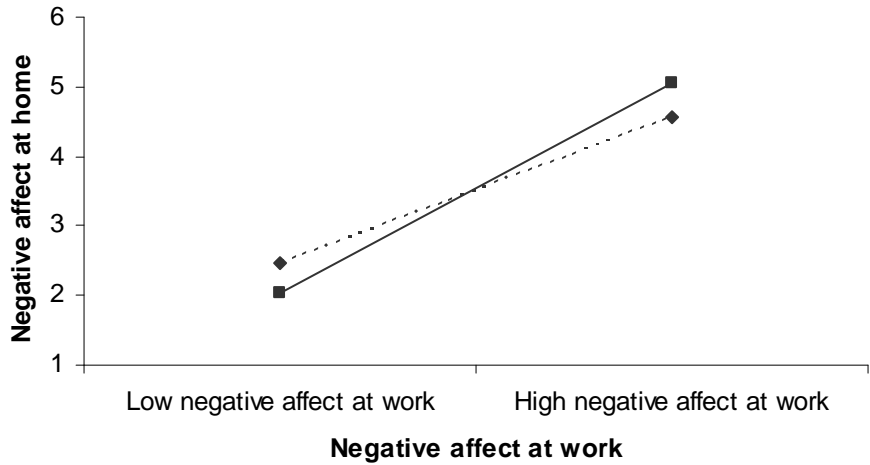(Wives are represented by dashed lines and husbands are represented by solid lines.)

Figure 3

The moderating effect of work orientation on the relationship between negative affect at work and negative affect at home. Dashed line represents those with work orientation lower than 1 standard deviation from mean. Solid line represents those with work orientation higher than 1 standard deviation from mean.
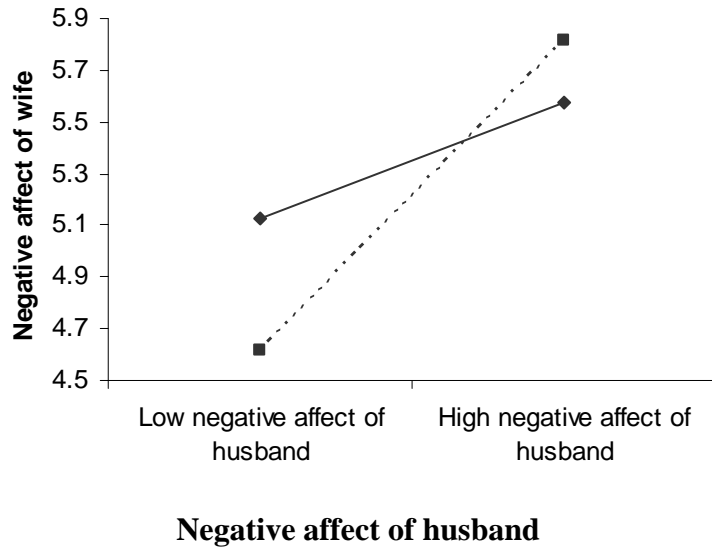
Figure 4

The moderating effect of having children on the relationship between negative affect of spouses. Dashed line represents couples without children. Solid line represents couples with children.