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Developing a Better Understanding of Daily Support Transactions across a Major Life Transition: The Role that Locus of Control Plays in the Process

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by

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Developing a Better Understanding of Daily Support Transactions Across a major Life Transition: The Role that Locus of Control Plays in the Process

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While much research has shown that being in a supportive relationship can buffer individuals from both the physical and psychological effects of stressful life events (House, Landis, & Umberson, 1988; Uchino, 2004), research concerning actual support exchanges, specifically receiving support, has been associated with negative effects (Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008). Understanding the differential effects of this process on mood and health is the focus of this study. The current paper adds to the existing literature by first, theoretically replicating previously established support transaction patterns and their effects on mood within committed couples and second, investigating the role that personality (i.e., perceived control) plays in moderating the effects of support on mood and health outcomes.

In a daily diary study of 78 couples expecting their first child, I investigate the within and between-person associations between control, support, mood, and health.

Couples were asked to independently complete three weeks of daily diaries at three different time points (i.e., during their third trimester, infancy, and toddlerhood). With the exception of women in their third trimester of pregnancy, we theoretically replicate previous support patterns and the effects on mood and find both state- and trait- level control to be important in this process such that the greater an individual's sense of control, the more he or she is buffered from negative influence of support transactions. Hypotheses concerning support and health are only partially supported in that receiving support and negative health symptoms are positively associated.

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Introduction

Research concerning coping and social support has consistently shown that being in a supportive relationship can buffer individuals from both the physical and psychological effects of stressful life events (House, Landis, & Umberson, 1988; Uchino, 2004). Indeed, extensive research based on perceived support, a construct which represents the support individuals believe is available to them when needed and/or the support individuals have received in the past, has been linked to many positive outcomes including physical, psychological, and relationship health (Albrecht, Goldsmith, & Thompson, 2003; Katz, Monnier, Libet, Shaw, & Beach, 2000; Monahan & Hooker, 1995; Talley, Molix, Schlegel, & Bettencourt, 2010). However, contrary to findings associated with perceived support, research concerning actual support exchanges, specific instances of support receipt, has been associated with an increase in stress and negative mood (Bolger, Zuckerman, & Kessler, 2000; Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008; Uchino, 2009).

The current paper furthers our understanding of the support process by examining daily support transactions as they occur over the course of a major life stressor—the transition to parenthood. Specifically, this project theoretically replicates previously established support transaction patterns and their effects on mood within committed couples. Further, this project will deepen our understanding of this process by investigating the role that locus of control, a personality construct, plays in moderating the effects of support on mood as well as on health outcomes that are theoretically linked

to both support and control constructs. More specifically, I examine daily support receipt and provision in couples across the transition to parenthood, the direct effects of this emotional support on both mood and health, as well as whether locus of control influences the way an individual experiences this support. Prior to discussing the hypotheses in detail, however, I discuss the literature concerning this specific life stressor, the relevant work concerning support, and how the intrapersonal characteristic of control may play a role in this process as well as the relevant health implications.

THE TRANSITION TO PARENTHOOD AS A STRESSOR

Becoming a parent is considered one of the most demanding and stressful life transitions an individual will face (Cowan & Cowan, 2000), often giving rise to symptoms of depression (O'Hara & Swain, 1996; Paulson, Dauber, & Lieferman, 2006) and stress (Perren, Von Wyl, Burgin, Simoni, & Von Klitzing, 2005). This psychological distress has the potential to negatively affect not only the individual but the individual's partner, their child, and their relationship with both their partner and their child (Matthey, Barnett, Ungerer, & Waters, 2000; Wenzel, Haugen, Jackson, & Brendle, 2005). The National Institute of Mental Health (National Institute of Mental Health, 2014) estimates that 50 – 80% of women experience negative postpartum symptoms including sadness, anger, and anxiety after giving birth that can last for months with 7-13% ultimately being diagnosed with postpartum depression which includes a high risk of suicide.

These negative effects are not limited to new mothers. Perren and colleagues (2005) found the transition to parenthood to be characterized by changes in emotional

functioning for both mothers and fathers, namely by an increase in depressive symptoms and felt stress. As would be expected, new mothers reported increased levels of depressive symptoms during pregnancy and the early postpartum period as did new fathers. These symptoms waned over the course of the first year but, unlike depressive symptoms, feelings of stress did not decrease between pregnancy and one year after birth. For most fathers and for mothers with psychopathology, one year after birth was the most stressful time point in this transition. If a life transition experienced by approximately 90% of couples can be expected to be accompanied by stress and distress, it is likely that this strain will influence some or all of the relationships in the family, which, in turn, can be expected to compromise optimal development and growth of the children involved.

Becoming parents is a unique stressor in that both partners are faced with a life-changing event that involves, among other things, adjusting to new, life-long roles. Research concerning this transition has identified important risk factors for negative adjustment to parenthood including, relevant to this work, low levels of spousal support and high levels of some personality characteristics (e.g., neuroticism) (Matthey, Barnett, Ungerer, & Waters, 2000; Simpson, Rholes, Campbell, Tran, & Wilson, 2003). Because this transition has a fairly long adjustment period requiring high levels of support, this context is an ideal and novel way in which to investigate the support process. To date, research measuring support transactions has focused on either highly stressed (e.g., exam preparation, illness) or non-stressed samples. Examining couples as they anticipate an impending birth, experience the acute stress of a newborn, and adjust to their new roles as parents provides unique insight into the support process as it progresses across a stressor.

Also, investigating personality in concert with support across this transition is important as both have been found to be independently important for the successful navigation of this transition.

SOCIAL SUPPORT

A Review of the Literature

One of the most powerful buffers of stress is social support and when navigating major life transitions we often solicit the support of close others. Social support, however, is associated with both negative and positive outcomes on individuals' physical and psychological health (Uchino, 2009). This is due, in part, to the various ways the construct of support is operationalized (e.g., perceived support, support receipt). Extensive research has long relied on the perceived availability of support when investigating the effects of social support. That is, how much support an individual believes is available to them in times of need and/or an individual's judgment of how much support he/she has received in past times of need. Research based on these operationalizations of the construct suggests a positive role for social support with regards to physical and psychological health including recovery from and adjustment to physical disease (Albrecht & Goldsmith, 2003; Monahan & Hooker, 1995; Talley, Molix, Schlegel, & Bettencourt, 2008), and relationship stability (Katz, Monnier, Libet, Shaw, & Beach, 2000). For instance, Talley and colleagues (2008) found greater perceived support from a partner to be associated with lower levels of depression among breast cancer patients, Katz et al. (2000) found perceived support from a spouse to be associated with

the individual's emotional adjustment to the stress of medical school, and Andersen, Kiecolt-Glaser, and Glaser (1994) found that couples who provide greater levels of support within their relationship report less emotional distress. Indeed, a large body of research suggests spousal support is positively related to one's mental health and psychological adjustment and negatively associated with distress and depression (Baruch-Feldman & Schwartz, 2002; Ross & Mirowsky, 2003).

Early work concerning support networks found support as defined by the reported number of confidants to have a strong effect on how stress is experienced with greater levels of confidants providing a stronger stress-buffering effect (Phillips & Fisher, 1981). Conversely, low levels of support concerning everyday hassles and demands are associated with depression and increased stress levels (Schaefer, Coyne, & Lazarus, 1981). These stress-buffering effects of support have long been of interest to researchers and the general conclusion is that the detrimental effects of stress appear to be reduced for those individuals with strong social support networks.

In addition to its positive relationship with mental health, support is also related to physical health. Because social relationships are believed to help buffer stress and promote positive states (Cohen, 2004), the support provided by these relationships has been considered, in general, a protective factor. Specifically, these relationships are protective against mortality and disease outcomes (Cohen, 1988; Elwert & Christakis, 2006). For example, married individuals tend to have lower mortality rates (Elwert & Christakis, 2006), as well as better self-reported health (Ren, 1997) while lack of social relations is predictive of coronary heart disease (Hemingway & Marmot, 1999).

Support and the Transition to Parenthood

As mentioned above, one of the risk factors for psychological distress across the transition to parenthood is a low level of social or partner support (O'Hara, 1995; O'Hara & Swain, 1996; Simpson, Rholes, Campbell, Tran, & Wilson, 2003). For instance, women who rated their partners as less supportive had babies who were born earlier and had lower APGAR (a measure of newborn fitness) scores than depressed mothers with higher perceived partner support (O'Hara, 1995). Women who perceive receiving greater prenatal support tend to experience better labor progress, have newborns with higher APGAR scores, and report less postpartum depression (Collins, Dunkel-Schetter, Lobel, & Scrimshaw, 1993), with perceptions of instrumental support being stronger predictors of these outcomes than perceptions of emotional support. Indeed, women's perception of partner support appears to buffer infants of depressed mothers from potential adverse outcomes. Interestingly, work by Simpson and Rholes (2008) suggests that, across this transition, wives on average perceived less support and more anger from their husbands, they sought less support, and their husbands reported providing less support. So while partner support is important for the successful navigation of this transition it seems that these transactions occur less frequently. Understanding the direct effects of support transactions for individuals when they do occur across this transition will contribute to the existing literature concerning enacted support.

A Paradox

Though some studies do find beneficial outcomes of support receipt, such as decreased postpartum depression (Collins et al., 1993), increased intimacy (Gleason, Iida,

Bolger, & Shrout, 2008), and increased likelihood of reciprocating support (Shrout, Herman, & Bolger, 2006), other research has found detrimental effects of support receipt such as perceived inefficacy (Bolger & Amarel, 2007), increased mortality rates (Krause, 1997), increased negative mood (Gleason, et al., 2003) or no effects on psychological well-being and other measures of functioning (Wethington & Kessler, 1986). Given this seeming contradiction, it has been suggested that the negative effects found for receipt of support could be due to either reverse causation (i.e., stress leading to support) or a third variable, specifically, a stressor leading to both distress and support. Diary studies and the use of lagged analyses provide evidence that argues against reverse causation. By including yesterday's mood in their models, researchers are predicting the residualized change in mood (today's mood) as a function of yesterday's support. Both Bolger et al., (2000) and Shrout et al., (2006) found that the negative effects of yesterday's support on mood do remain after this adjustment. Additional evidence involves data simulation in which data were configured such that support was being elicited by distress (Seidman, Shrout, & Bolger, 2006). These simulated data were then analyzed using the same method employed by Bolger et al., (2000). Seidman et al., (2006) concluded that the effects found by Bolger et al. could not have been obtained with data that in actuality fit the reverse causation model. These same researchers investigated the third variable explanation. They created fictitious data in which the level of distress on a given day was caused by the previous day's distress, and the same day and previous day's adversity. Similarly, same day support transactions were modeled to be more likely when support was provided on the previous day and when adversity was experienced either on the same

day or on the previous day. Using Bolger et al.'s (2000) analytic strategy, Seidman et al. concluded that Bolger et al.'s effect sizes were unlikely due to an omitted third variable. Laboratory experiments offer additional evidence against the argument for a third variable. Bolger and Amarel (2007) demonstrated the detrimental effects of receiving support by randomly assigning participants to support or no support conditions. They found that students asked to give an impromptu speech were more anxious when they were aware of having received support than those students who did not receive support. Taken together, these findings suggest that the relationship between receipt of support and negative mood is not spurious.

Diary studies have provided some insight into the contradictory findings regarding receipt of social support. Gleason and colleagues measured support transactions within non-stressed couples and found that on days when a partner reported receiving support but was not able to provide support, they indeed experienced their highest levels of negative mood (2003). However, they found that on days when a partner was able to reciprocate (both receive and give support; supportive reciprocity), the pattern was reversed and they reported their lowest levels of negative mood. In a similar diary study addressing the support transactions of couples in which one partner was facing a stressor (upcoming bar examination), Gleason and colleagues examined the dual effects of support on personal distress and relationship closeness (Gleason, Iida, Bolger, & Shrout, 2008). This work provided a more nuanced look at how support receipt can provide both beneficial and adverse effects simultaneously at the relationship and individual level (respectively). Researchers found that daily support receipt was indeed

associated with greater feelings of closeness, but also with greater negative mood. They also found considerable variability in the way individuals responded to receiving support. For most recipients support was associated with increased relationship closeness and negative mood, but for a substantial subset of individuals (approximately 1/3 of the sample) support receipt was solely positive leading to higher closeness and lower negative mood. They were, however, unable to identify a personality characteristic that explained these different reactions to support receipt.

Many explanations have been proposed in order to explain these and other negative effects of support all of which concern individual characteristics of both the recipient and provider or of their relationship. In line with reciprocity theory, Uehara (1995) has argued that receiving support might make the recipient feel over-benefitted or indebted to his or her partner, thereby increasing stress and anxiety (see also Fehr, Kirchsteiger, & Riedl, 1993). Indeed, the work by Gleason and her colleagues supports this notion as they find that on reciprocal support days negative mood was low and relationship closeness high, however, as mentioned were unable to explain the variation in individuals' reactions. Bolger et al., (2000) suggest that social support may undermine the recipient's self-concept in that it may signal to the recipient that he or she is incompetent and dependent on the provider for help. And similarly, Gleason and her colleagues (2008) posit that receiving support may leave the recipient feeling inefficacious but that by reciprocating, thereby demonstrating one's efficacy, the negative effects are alleviated. This is in line with cognitive theory which posits that negative

thinking styles, such as the perception that one is powerless (i.e., low sense of control), put one at risk for psychological distress (Rotter, 1982).

While these and others have offered possible moderators of these surprising negative effects of support receipt, very few have investigated the role of personality factors in the enacted support process. The current study was designed to investigate this question further by examining the intrapersonal characteristic of control within the interpersonal process of support.

Support and the Role of Personality

As posited above, the process of support involves not only the supportive transactions but the personalities of both people involved. While navigating a large stressor, individual personality characteristics likely influence the way one reacts to support and may ultimately be altered by the stressor. Recall that Gleason and colleagues (2008) found considerable variation in the way that participants responded to receiving support. In line with the cognitive-affecting processing model, these differential findings of support effectiveness are not surprising (Mischel & Shoda, 1995). In the field of personality psychology, Mischel and colleagues have encouraged researchers to approach human behavior and cognition from a person by situation interaction perspective (Mischel & Shoda, 1995; Mischel, 2004). They argue that, in order to best understand personality in concert with thoughts and behaviors of an individual, both person factors and situational contexts must be considered.

Support processes do not exist void of these complex factors. In other words, outcomes based on support transactions are a product of both intrapersonal characteristics

and the situation within which they occur. Fisher et al., (1982) have suggested that situational conditions include provider characteristics (e.g., behavior and attributes of the provider as perceived by the recipient), support characteristics (e.g., cost to the provider), and context characteristics of the support transaction (e.g., recipient's ability to repay the provider). Recipient characteristics include stable dispositions or skills and temporary emotional or cognitive states (Gergen, 1974). Indeed, behaviors exhibited within the support process are not appraised objectively, but instead are interpreted through a cognitive filter of the support recipient (Lakey & Drew, 1997). For instance, individuals high in anxious attachment tend to perceive ambiguous behavior from a close other as less supportive, compared to individuals low in anxious attachment (Collins & Feeney, 2004). Simpson and Rholes (2008) provide additional evidence that suggests the working models of highly anxious women may be distorting their perceptions of spousal support in an overly negative direction. They found that more anxious women who perceived less prenatal spousal support also sought less support from their husbands and reported steeper declines in marital satisfaction across the transition to parenthood. Additionally, highly anxious women perceived significantly less support than their husbands claimed they offered. Underscoring this notion that personality may moderate the support process, Lepore (1995) found that social support was beneficial for individuals low in trait cynicism but ineffective for those high in trait cynicism.

Personal Control as a Potential Moderator of Support

Interestingly, early work in the area of perceived support and stress found differential stress-buffering effects for individuals with internal versus external control

orientations. Specifically, studies concerning the stress-buffering effects of support found locus of control to influence the degree to which individuals experience stress such that individuals who believe they have control of their own lives experience less stress and conversely, those who believe that their lives are out of their control experience greater levels of stress and the subsequent, adverse effects of stress (Lefcourt, Martin, & Saleh, 1984; Sandler & Lakey, 1982). In fact, Sandler and Lakey found that while externals receive a greater quantity of support than internals, the stress buffering effect of perceived support is evident only for internals. Despite these findings, the empirical literature has typically treated support and control separately. However, the question about the joint effectiveness of these two constructs may provide a better understanding for why some individuals positively adapt to stressful life events while others struggle.

The construct of personal control has been studied extensively and has been found to hold serious implications for an individual's psychological well-being and health (Cunningham, Lockwood, & Cunningham, 1990; Keeton, Perry-Jenkins, & Sayer, 2008; Mirowsky & Ross, 1990; Shapiro & Shapiro, 1983) as well as relational well-being (Bugaighis, Schumm, Bollman, & Jurich, 1983). Work on health behaviors has shown that those with an internal locus of control have a more positive adaptation to health challenges than those who do not. For instance internal locus of control in cancer patients has been positively correlated with self-esteem (Lewis, 1982), and positive mood (Cunningham, Lockwood, & Cunningham, 1991). Conversely, anxiety and depression among cancer patients has been associated with a more external locus of control or lack of feeling in control (Shapiro & Shapiro, 1983) and lower levels of control have been

found to be positively related to declining psychological adaptation to a cancer diagnosis (Ell, Nishimoto, Morvay, Mantell, & Hamovitch, 1989).

Control theory suggests that individuals with a greater sense of internal control tend to operate via beliefs that mediate adaptive coping responses (Rotter, 1982). An early review of the literature on locus of control and stress suggests possible reasons for this relationship (Lefcourt, 1983). First, because an important aspect of stress is the degree to which an individual feels they have control over a given situation, internals experience the same events as less stressful than externals. And second, because internals believe that events are determined by their own actions and behaviors, they usually take more proactive steps to eliminate or avoid a stressor. Work on stress supports these notions suggesting that those individuals with a greater sense of internal control have more positive outcomes in the face of stress than their external counterparts (Lefcourt, Martin, & Saleh, 1984; Sandler & Lakey, 1982; Shapiro & Shapiro, 1983). Specifically, Lefcourt and colleagues (1984), like Sandler & Lakey, found that the stress-buffering effects of support were only evident for their participants with an internal locus of control and Fusiler, Ganster, and Mayes (1987) found that those with an external locus of control respond more strongly to stress in their work environment than their internal counterparts.

Generally speaking, those with a more internal sense of control tend to report more positive outcomes than those with an external locus of control. Though originally conceived of as a stable trait, recent research suggests that locus of control should be considered at both the state and trait level (Ryon & Gleason, 2014). In fact, we found

greater variability in daily locus of control than for daily anxiety and depression in our sample. We also found that daily control was significantly associated with daily hassles and stressors as well as positive health habits and negative health symptoms. Additionally, using the mean of our daily control measure, we found it to predict health outcomes while a well-established measure of trait-level control did not. Because we have established variation of locus of control on a daily basis, I am able to examine it in concert with daily support transactions and determine better how the two operate together.

The Current Study

The transition to parenthood is an ideal context in which to study the interpersonal process of support and the potential moderating effects of the intrapersonal characteristic of control. The novel experiences and lack of control often associated with this transition make it a stressful life event for most couples. In order to theoretically replicate previous findings and to determine the extent to which locus of control potentially moderates the effects of the support process, first-time pregnant individuals and their partners (78 couples) were recruited in their third trimester of pregnancy. They were assessed at three time points across the transition to parenthood (during the third trimester, infancy, and toddlerhood). In all three phases individuals were asked to complete three-weeks of daily diaries that measure, among other things, daily control, mood, health behaviors and symptoms as well as support transactions with their partners.

The purpose of this longitudinal daily diary study is three-fold. First (Hypothesis 1), in order to gain a more nuanced understanding of daily support transactions on mood, this study was designed to theoretically replicate findings established by earlier research (i.e., supportive reciprocity) (Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008). While this work has established a pattern in both stressed and non-stressed populations, the current study examines this interpersonal process *across* a major life transition. In other words, this study captures support transactions and mood while couples are anticipating a stressor (i.e., third trimester), during an acute period of stress (i.e., during infancy), and then again when new parents have had time to adjust to their new roles (i.e., during toddlerhood).

Second (Hypothesis 2), this study seeks to determine the role that personality plays in this interpersonal process. When considering the actual act of receiving support, researchers speculate that receiving support either leaves the recipient feeling indebted (based on reciprocity theory) or that it highlights feelings of inadequacy or a lack of efficacy or control resulting in increases in negative mood.

Reciprocity theory suggests that it is the act of giving back that alleviates the negative feelings associated with inequitable exchanges (Fehr, Kirchsteiger, & Riedl, 1993). According to this theory, it is a feeling of indebtedness that causes greater negative mood in an individual who is unable to provide support to their partner once they have received support from their partner (Fehr, Kirchsteiger, & Riedl, 1993). However, this same research also suggests that in close relationships, partners should feel less indebted as they will likely have opportunities in the future to reciprocate the support. Despite this caveat, Gleason and her colleagues do find beneficial effects of reciprocity for committed partners such that on a day when an individual reports receiving support, they report greater levels of negative mood but on days when an individual reports both receiving and giving support to their partner (supportive reciprocity) they report their lowest levels of negative mood. These researchers speculate that receiving support may act to highlight the need for the support (i.e., inadequacy or lack of efficacy), which, in turn, leads to increases in negative mood and that by reciprocating or giving back they alleviate these negative feelings by demonstrating competence. However, despite the average effects of supportive reciprocity, Gleason et al. found individuals responded with considerable variation to receiving support

suggesting that the effects of receiving support are moderated by personality characteristics. According to cognitive theory, negative thinking styles such as the perception that one is powerless (i.e., low sense of control) put one at risk for psychological distress and therefore may leave some individuals more susceptible to the negative effects sometimes associated with support.

Another way to think about this relationship draws from the tenants of control theory which suggest that one who feels as if he or she is in control of one's life tends to employ more adaptive coping responses than one who feels less in control. The amount of stress an individual feels is relative to the amount of control they feel over a given situation therefore those individuals with an internal sense of control experience similar events as less stressful than their external counterparts. Also, because internals believe that they are in control of these events, they are more likely to take steps to avoid or combat any related stress. So when a stressor presents itself, the degree to which an individual feels in control should moderate the effects of support transactions on mood in the following ways: 1) for individuals who have a higher than average sense of control and for those days when one is feeling a greater sense of control than they normally do, receipt of support should not lead to increases in negative mood as the support does not call into question their capabilities, efficacy, or competence rather it can act as a useful tool in their adaptive response to a stressor. The support, in this situation, may have even been solicited as those with an internal sense of control tend to be more proactive in their coping strategies; and 2) for those with lower than average levels of internal control and for those days when one is feeling less in control than their own average, I would expect

to see similar patterns found in the supportive reciprocity work conducted by Gleason and colleagues such that support would act to highlight incompetency leading to higher levels of negative mood, but this could be mitigated through the provision of support. Since maladaptive thinking styles put one at risk for psychological distress, being reminded that one is powerless or incompetent (through offered support) can act to increase these negative feelings about the self. It is in this condition that the act of giving support back to one's partner becomes important as it enables the provider to feel a sense of control or efficaciousness.

Lastly (Hypothesis 3), given the important health outcomes associated with support, this study will examine the extent to which control influences the effects of daily support transactions on negative health symptoms as well as positive health behaviors. There exists a body of research that suggests a positive role for social support with regards to a variety of specific life events including a diagnosis of cancer (Albrecht & Goldsmith, 2003) and aging (Krause, 1987). Additionally, a large body of research has found that for individuals diagnosed with a physical disease, those with an internal locus of control have a more positive psychological adaptation than those who do not (Cunningham, Lockwood, & Cunningham, 1990; Ell, Nishimoto, Morvay, Mantell, & Hamovitch, 1989; Lewis, 1982; Shapiro & Shapiro, 1983). Based on control theory, it stands to reason that those with a more internal sense of control would engage in more proactive behaviors in order to avoid health issues. And since these same individuals tend to operate via beliefs that mediate adaptive coping responses, it seems that they might,

more effectively, put to use the support available to them in order to ensure optimal health.

Method

Participants

Participants were 78 couples transitioning to parenthood for the first time. At the start of the study, expectant mothers were in their third trimester of pregnancy. Couples were recruited using several methods. Couples from the prenatal waitlist for a childcare laboratory at a large Southwestern University were contacted via email. Community-wide recruitment involved advertisements in local newspapers and websites including *Facebook* and *Craig's List.* Additionally, local retailers, wellness centers, and OBGYN offices were asked to display recruitment fliers and postcards. Eligibility requirements included: (a) the pregnant partner had entered her third trimester of pregnancy (27^{th} week)[1], (b) this was the first child for both partners, and (c) both partners could read and write in English.

At the start of the study, participants ranged in age from 19 to 42 years old. On average, pregnant partners were 28.7 (*SD* = 4.4) years old and non-pregnant partners were 30.2 (*SD* = 5.2) years old. Seventy-nine percent of the pregnant women identified themselves as White, 25% as Hispanic/Latina, 1.3% as African American, and 7.9% as Asian American. Eighty-three percent of their partners identified themselves as White, 16.7% as Hispanic/Latino, 3.9% as African American, and 5.2% as Asian (participants were asked to 'please check all that apply' resulting in cumulative percentages greater than 100 percent). Eighty-seven percent of the couples reported being married with a

[1] Adoptive parents expecting their infant to be placed with them in the next three months were also eligible to participate in the study, but none participated.

median household income range of $60,000 to $99,999 annually. The pregnant women reported a median income range of $20,000 to $39,999 annually while their partners reported a median income range of $40,000 to $59,000 annually. Assuming no change in household income across this transition, 23.1% of my sample is estimated to be living below twice the national poverty line once their child is born. Overall, couples reported being together an average of 5.41 years (*SD* = 3.41). Sixty-eight couples reported that they were married and two couples reported that they did not share a residence. There was no significant difference between pregnant women's reports of relationship satisfaction (*M* = 73.28, *SD* = 7.27) and their partners (*M* = 71.21, *SD* = 8.16) (t(77) = 1.26, p =.32) as measured by the Couples Satisfaction Index developed by Funk and Rogge (2007). This scale ranges from 0-81 with larger values indicating greater satisfaction. Their original sample, used to develop the scale, had an overall mean of 61 with a standard deviation of 17, suggesting my sample is higher than average in relationship satisfaction. Couples were heterosexual with the exception of one same-sex (female) couple. For simplicity and ease of reading, the pregnant partners will often be referred to as "mothers" and the non-pregnant partners as "fathers" throughout the manuscript (the categories are equivalent).

Procedure

The study consists of three phases. In Phase 1, during their third trimester, couples came into the lab to complete individual background measures and be trained in the use of electronic daily diaries. The background survey assessed basic demographic information as well as couples' current relationship satisfaction, general health,

communal/exchange orientation, the Inclusion of Other in Self scale (Aron, Aron, & Smollan, 1992), expectations about the experience of parenting, chore division, childcare plans, attachment style, perceived support, big-five personality, and locus of control. For the hypotheses I examine, only the locus of control scales are considered. The background measure was administered via the internet using Snap Surveys software. Participants were assigned a unique login ID for access to the surveys. Upon completion of the background measures, couples were trained on the use of the diary devices.

The diaries were administered on iPod touches (Apple Corporation) provided by the researchers using the iForm data collection software developed by Zerion Corporation. Participants were asked to complete an individual daily diary nightly for a three-week period antepartum. The variables of interest for my hypotheses consisted of emotional support exchanges between partners, momentary mood, negative health symptoms, positive health behaviors, daily hassles, and daily perceived control. The diaries also asked about sleep, support from people other than the partner, practical support from the partner, daily relationship closeness, social contact, time usage, sexual activities, connection to the baby, medical appointments, and positive daily experiences. All participants received their own password-protected device to ensure privacy. These devices automatically tracked the date and times the surveys were completed and stored the data for later download by the experimenter. The devices were programmed to allow access to each day's diary between the hours of 5:00 p.m. and 1:00 a.m. This feature eliminated the potential for participants to complete multiple diaries at one time. Questions were asked in the same order each day and took approximately 5-10 minutes to

complete (participants become faster at completing the survey the more times they take it). Participants were provided postage paid mailers in order to return the devices to the lab at the end of the 3-week period. Couples were paid $50 once the devices were received by the lab.

Similar to the first phase, Phase 2 consisted of an online survey as well as a three-week period of daily diaries administered when the child was approximately 10 weeks old. Participants were provided a unique ID and an electronic link to access the system and take the background survey remotely. With the exception of basic demographic information, the survey consisted of essentially the same measures found in the Phase One background measure. Password protected diary devices were mailed to participants via the United States Postal Service. These devices (iPod touches) used the same technology as that described in Phase 1 and were nearly identical to those described above with the inclusion of a few questions regarding their infant. Participants were provided postage paid mailers in order to return the devices to the lab at the end of the 3-week period. Couples were paid $100 once the devices were received by the lab.

Similar to Phases 1 and 2, Phase 3 consisted of an online survey as well as a three-week period of daily diaries administered when the child was approximately 14 months old (See Appendix A). Protocol for Phase 3 was exactly the same as that of Phase 2. However, the online measure was administered via the internet using Qualtrics software. Assessment included the same measures described above excluding attachment style measures. Password protected diary devices were mailed to participants via the United States Postal Service. These devices (iPod touches) used the same technology as

that described in Phase 1 and again assessed the variables of interest as well as the additional measures listed in Phase 2 and added questions on parental conflict, novel activities, and capitalization concerning their toddler. Participants were provided postage paid mailers in order to return the devices to the lab at the end of the 3-week period. Couples were paid $150 once the devices were received by the lab.

Diary completion rates for Phase 1 are as follows: fifty-three percent (46 pregnant, 37 non-pregnant) of participants completed all 21 days of diaries. Ninety percent (72 pregnant, 68 non-pregnant) of participants completed at least 14 days of the diaries and 98% (77 pregnant, 76 non-pregnant) of participants completed at least one week (7 days) of the daily diaries. Reasons given for diaries with fewer than seven days of entries included: pre-term birth for one couple and another lost the device. In all, pregnant women completed a total of 1068 days of diaries and their partners completed 992 days of diaries. Though the electronic method of data collection was a strength of this research, researcher error resulted in the loss of diary data from one couple (the device was erased prior to the data being stored). Additionally the background data from one participant was not successfully uploaded due to server error.

Seventy-four of the original 78 couples participated in Phase 2 (95%). Two of the couples chose not to continue specifying lack of time as their reason, one couple lost their baby to still birth, and one couple could not be located. Of the 74 couples retained in Phase 2, diary completion rates are as follows: thirty-nine percent (32 pregnant, 26 non-pregnant) of participants completed all 21 days of diaries. Eighty-four percent (62 pregnant, 63 non-pregnant) of participants completed at least 14 days of the diaries and

96% (72 pregnant, 70 non-pregnant) of participants completed at least one week (7 days) of the daily diaries. In all, new mothers completed a total of 1378 days of diaries and their partners completed 1300 days of diaries.

Phase 3 was not included in the original research plan meaning that at the start of the study, couples only agreed to participate in phases 1 and 2. After receiving permission from the internal review board, I attempted to contact participants to ask them to participate in phase 3. As a result, fifty-four of the original 78 couples participated in Phase 3 (69%). Of the 20 couples lost between phase 2 and 3, nine of the couples chose not to continue specifying lack of time as their reason, six couples failed to respond to the request to participate, four couples returned the devices with no data, and the remaining couple reported extenuating circumstances. Of the 54 couples retained in Phase 3, diary completion rates are as follows: fifty-nine percent (33 pregnant, 31 non-pregnant) of participants completed all 21 days of diaries, 90% (49 pregnant, 48 non-pregnant) of participants completed at least 14 days of the diaries, and 94% (49 pregnant, 51 non-pregnant) of participants completed at least one week (7 days) of the daily diaries. In all, new mothers completed a total of 1051 days of diaries and their partners completed 1039 days of diaries. Using multilevel models I tested to see if couples who did not to participate in the third phase were different from those who agreed to continue participation. No significant differences were found on of the following variables measured at the start of Phase 1: global relationship satisfaction, trait-level locus of control, length of relationship, marital status, and income. Nor were they different in their average daily sense of control across the first diary phase.

Measures

Locus of Control: Internal subscale. Measured at the start of each phase (three times over the course of the study), Levenson's (1981) scale consists of 24 items measured on a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The scale consists of separate measures of internality (general perceived control; 8 items), control by others (8 items), and the effects of chance (8 items). Only the Internal subscale is used in the current study. Sample items include: "When I make plans, I am almost certain to make them work" and "I can pretty much determine what will happen in my life." Responses for the Internal subscale are summed with scores ranging from 8 – 48. Levenson found means ranging from the low 30's to the low 40's (SD values approximating 7). The means and standard deviations are listed by partner and phase in Table 1.

Diary Measures

The means and standard deviations for diary measures listed by partner and phase can be found in Table 1 and are described below.

Personal control items. To assess personal control on a daily basis, the research team developed a 3-item measure based on Levenson's Internal subscale and Paulhus' Self-Efficacy subscale (Ryon & Gleason, 2013). The items were rated on a 5-point Likert scale from 0 (*not at all true*) to 4 (*very true*). Internal items included: "I feel that I have control over the things that happen to me" and "Today I was able to deal with my problems." The self-efficacy item asks: "Today I was able to manage my health well." See Table 1 for means and standard deviations. In the original sample of 78 couples

expecting their first child, the daily control scale showed adequate reliability of change within-person for both pregnant (alpha = .74) and non-pregnant partners (alpha = .64). These alphas indicate that this scale is viable for detecting systematic change in control over days.

Negative mood. Anger, depressed mood, and anxiety were measured using items from the Profile of Mood States (McNair, Lorr & Droppleman, 1971). For each mood, at least three high-loading items from a factor analysis conducted by McNair, Lorr, and Droppleman (1971) were used. Anger and anxiety consisted of three items, and depressed mood consisted of four items. For each of these items, participants rated how they felt "right now" on a 5-point Likert scale ranging from 1(not at all) to 5 (extremely). This shortened daily measure of negative mood has previously been documented to be a realiable and consistent measure (Cranford, Shrout, Iida, Rafaeli, Yip, & Bolger, 2006) and has been shown to be influenced by daily support exchanges (Gleason, et al., 2008).

Health. To assess health on a daily basis, the research team developed a 5-item measure that assessed negative health symptoms and positive health behaviors. Items were rated on a 5-point Likert scale from 1 (*not at all*) to 5 (*very much*) and included: "I felt ill today," "I felt tired," and "I had pain or discomfort today" (negative health symptoms), and "I exercised today" and "I followed a healthy diet" (positive health behaviors).

Support exchanges. Participants' provision of both emotional and practical support to their partner and receipt of both emotional and practical support from their partner was assessed each evening. Each measure consisted of a single item in which participants reported whether they had provided emotional support to their partner and, separately,

whether they had received emotional support from their partner. Support receipt was coded 1 and a lack of receipt was coded 0; similarly, support provision was coded 1 and a lack of provision was coded 0.

Covariates

Phase. Each of the phases in the current study represent different times in the transition to parenthood and therefore represent different contexts within which the couples exist. Phase 1 is during the third trimester (will also be reffered to as the pregnancy phase), Phase 2 is when the infant has been in the home for approximately 10 weeks (i.e. the infancy phase), and finally, Phase 3 is captured shortly after the child turns one year old (i.e. the toddler phase). Phase was coded as -1, 0, and 1 in all analyses such that the phase directly after the transition (i.e. the birth of the baby) was therefore the referrent phase. Even when phase did not significantly interact with my variables of interest, I examined the effects at each phase and report accordingly.

Day in study. Temporal effects of being in the study were adjusted for by including day in the study. For each phase the first day of the diary period was coded as 0. If one partner started the diaries before the other partner, the day that the first partner started was coded 0 for both partners.

Age of child. A variable centered on the baby's date of birth was created such that for days in phase 1, day will be a negative value equivalent to the time till the baby's arrival and following the birth (phase 2 and 3) will be a positive value corresponding to the baby's age in days. For phase one, the average number of days till birth was -52.71 ranging from -117 to zero. The average age for children in phase two was 87.53 days

ranging from 46 to 156 days old, and the average age of children in phase 3 is 425.47 days ranging from 374 to 500 days old.

Weekend. Previous studies find mood to be systematically better on weekends than on weekdays and couples are more likely to spend time together providing more opportunities for support exchanges (Gleason et al., 2008), therefore I adjusted for this potential confound by including weekend as a control (weekdays = 0, weekends = 1).

Daily hassles. To assess the experience of hassles on a daily basis, the diary presented participants with a researcher-generated checklist of hassles developed for the current study based on scales used in previous studies (Bolger, et al., 1989; Gleason et al., 2008). The list consisted of 8 common every-day hassles including: conflicts with partner, financial issues, and car maintenance. Participants were asked to indicate whether they had experienced any of the hassles that day. A composite hassles score was computed for each partner on each day by summing the number of hassles reported, with higher scores indicating greater hassles. The options of ‘other hassles’ and ‘no hassles’ were included in this list. In order to receive a score of 0 on the hassles scale, a participant had to check 'no hassles'. If particpants did not check any of the options, that day's hassles were recorded as a missing value.

Analytic Approach

The goal of the current analyses is threefold. First, in order to theoretically replicate findings by Gleason and colleagues concerning supportive reciprocity (Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008), the effects of receiving emotional support from and providing support to one's partner on the individual's level of negative mood on a daily basis are examined. Next, the potential moderating role that the individual's sense of control (both state and trait levels) plays in the association between the support process and negative mood is investigated. Finally this paradigm is extended to investigate whether the support process and the individual's sense of control influence theoretically related health constructs.

Hypotheses were investigated using a multilevel approach. These analyses accounted for the fact that the data are dependent due to the nesting of persons within couples across time (both day and phase). The MIXED procedure in SAS 9.3 (SAS Institute, 2008) is used to model both the within-individual level and the between-individual level. The models were dual intercept models (sometimes called "no-intercept" models), which allowed the pregnant partner (mothers) and non-pregnant partner (fathers) to be estimated simultaneously and separately. The covariance matrix of the residuals was structured such that same-day correlations were allowed for residuals within each couple, and cross-day correlations with a first-order autoregressive pattern were allowed for residuals within each person, accounting for dependency within couples and across days. As recommended by Kenny, Kashy, and Cook (2006), degrees of freedom in the analyses were determined using Satterthwaite approximations. Contrast

analyses investigated whether the mothers' and fathers' coefficients significantly differed from one another and only those that showed a significant difference are reported in the results section.

All models include day in study to adjust for temporal effects of participating in a diary study and age of child to adjust for the stage at which couples were experiencing first-time parenthood. Additionally, as the phases are not continuous, phase is also included in all models as a main effect. As mentioned above, phase was coded such that the second phase (baby at 10-weeks) is the referent phase (when phase = 0). A variable representing weekend is included as negative mood and hassles are lower on weekend days while support is often higher as couples spend more time together introducing possibly spurious associations between the variables of interest. Given that support is more likely to be received on days when individuals experience hassles, a count of daily hassles is included to adjust for the effects of these events as a third variable. The analyses allows the intercept to be random meaning that a participants' starting value of the outcome of interest is allowed to vary individual to individual.

The series of models needed to investigate my hypotheses are complex and are described in detail below. The series was repeated as needed for each outcome variable (negative mood, negative health symptoms, and positive health habits).

Model 1: A theoretical replication of Gleason et al.'s (2003) finding that negative mood is highest on days when one only receives support from one's partner and lowest on supportive reciprocity days is the first model tested. In this model only the variables examining within-person support receipt and provision and their interaction were

included in the model as well as the aforementioned controls (the control variables are in all models and will not be mentioned again). Phase is entered as a main effect, but this model otherwise tests across phases and does not test whether these processes differ within the three different phases. Model 3 will fully test for phase effects.

Model 2: Since the publication of Gleason, et al. (2003, 2008) it has been recommended that in order to fully disentangle within versus between-person effects, a between-person centered version of the within-person effects be included in all models (Bolger & Laurenceau, 2013). In order to do this, for instance, a variable was created that represented the percentage of days in a given diary period a person received emotional support from his/her partner and subtracted the overall mean of support receipt (i.e. the average percentage of days that all participants reported receiving support across the study) to create a centered between-person version of support receipt. This variable tests whether those who receive more or less support than an average study participant across the three-week diary period systematically differ from one another. Centered between-person variables were also created for support provision and hassles for each participant in each phase. These variables as well as the interaction of between-person centered receipt and provision were entered into the model. Results from this model will tell me both whether support receipt, provision, and their interaction on a given day affect that day's negative mood (isolated within-person effects) as well as whether individuals who generally receive and provide more or less support than the average person across the course of the study have generally higher or lower negative mood levels while controlling for the number of hassles experienced daily and across the study.

Model 3: This model examines whether the support process changes across phase. Is the effect of the support process variable based on whether participants are expecting a child, have just had a child, or have a toddler? To accomplish this, phase is interacted with every variable in the model.

Model 4: This model tests for moderation of the support process by both within- and between-person locus of control as derived from daily locus of control. Centered within-person locus of control is calculated by subtracting each person's mean daily locus of control from their daily scores. Centered between-person daily locus of control is created taking the mean of daily locus of control across the study and subtracting the grand mean (the average level of daily locus of control for all participants in the study). Both centered within- and between-person daily locus of control are entered in the model as main effects and interacted with within-person support receipt, provision, and their interaction and centered between-person daily locus of control is interacted with the between-person support receipt, provision, and their interaction. Within-person centered daily locus of control tests whether being higher or lower than one's own average daily locus of control on a given day affects negative mood (main effect) and whether it affects the effects of daily support exchanges on negative mood. Between-person centered daily locus of control tests whether being a person who is generally high or low in daily locus of control (i.e. reporting higher daily locus of control across the study as compared to other participants) affects negative mood and whether it affects the effects of daily support exchanges on negative mood. In addition, centered between-person daily locus of control can be interacted with between-centered support receipt, provision, and their

interaction (discussed in Model 2) in order to test whether being a person generally high or low in daily locus of control influences how overall patterns of support across the study impacts daily negative mood. If phase was a significant moderator of any effects in Model 3, it would also be interacted with relevant variables in this model.

Model 5: This model is identical to Model 4, but the background Locus of Control (Levenson, 1981) measure is substituted for the between-person centered daily locus of control. This model examines whether the background or personality measure of locus of control behaves similarly to that derived from daily measures. It varied by phase and was centered using the grand mean for the sample.

Below is the within-individual equation (the half representing pregnant partners) for Model 4, my most complicated model (assuming phase did not significantly modify any variables of interest):

$$M_{ijk} = (P_{ijk}) * (b_{0pj} + b_{1pj}Phase_{ij} + b_{2pj}D_{ijk} + b_{3pj}W_{ijk} + b_{4pj}A_{ijk} + b_{5pj}M_{ijk-1} + b_{6pj}H_{ijk} + b_{7pj}G_{ijk} + b_{8pj}R_{ijk} + b_{9pj}(G_{ijk} * R_{ijk}) + b_{10pj}LOC_{ij} + b_{11pj}(G_{ijk} * LOC_{ij}) + b_{12pj}(R_{ijk} * LOC_{ij}) + b_{13pj}(G_{ijk} * R_{ijk} * LOC_{ij}) + e_{ijk})$$

$$+ (NP_{ijk}) * (b_{0npj} + b_{1npj}Phase_{ij} + b_{2npj}D_{ijk} + b_{3npj}W_{ijk} + b_{4npj}A_{ijk} + b_{5npj}M_{ijk-1} + b_{6npj}H_{ijk} + b_{7npj}G_{ijk} + b_{8npj}R_{ijk} + b_{9npj}(G_{ijk} * R_{ijk}) + b_{10npj}LOC_{ij} + b_{11npj}(G_{ijk} * LOC_{ij}) + b_{12npj}(R_{ijk} * LOC_{ij}) + b_{13npj}(G_{ijk} * R_{ijk} * LOC_{ij}) + e_{ijk}) \quad (1)$$

The dependent variable M_{ijk} is daily mood for individual *i* (when *i* = 1 the outcome is for pregnant partners and when *i* = 2 the outcome is for non-pregnant partners), in couple *j*, on day *k.* When the outcome is mood for the pregnant partner, P_{ijk} = 1 and NP_{ijk} = 0, and the first part of the model is selected and all of the *b* coefficients

have the subscript *p*. When the outcome is mood for the non-pregnant partner, $P_{ijk} = 0$ and $NP_{ijk} = 1$, and the second part of the model is selected and all of the *b* coefficients have the subscript *np*. $Phase_{ij}$ represent phase in the study, D_{ijk} represents day in study; W_{ijk} represents weekend; A_{ijk} represents the child's age; M_{ijk-1} is yesterday's mood; G_{ijk} is the individual's report of support provision (giving); R_{ijk} is the individual's report of receiving support; H_{ijk} is the number of hassles an individual reports; LOC_{ij} is within-person daily control for each individual; $G_{ijk} * R_{ijk}$ is the interaction term for giving and receiving support; $G_{ijk} * R_{ijk} * LOC_{ij}$ is the 3-way interaction term for giving and receiving support and within-person locus of control; and e_{ijk} is a residual component specific to individual *i* in couple *j* on day *k*. The coefficient b_{0ij} is the regression intercept for individual *i* in couple *j* and represents daily mood on a weekday at the start of the second phase (baby is 9-weeks old) when no support is given or received and yesterday's mood and daily locus of control are at each individual's average level.

The between subjects equations were as follows:

$$b_{0pj} = \gamma_{00} + \gamma_{01}BH_{ij} + \gamma_{02}BLOC_{ij} + \gamma_{03}BG_{ij} + \gamma_{04}BR_{ij} + \gamma_{05}(BG_{ij} * BR)_{ij} + \gamma_{06}(BG_{ij} * BLOC_{ij}) + \gamma_{07}(BR_{ij} * BLOC_{ij}) + \gamma_{08}(BG_{ij} * BR_{ij} * BLOC_{ij}) + u_{0pj} \quad (2)$$

$$b_{2pj} = \gamma_{20} \quad (3)$$

$$b_{7pj} = \gamma_{70} + \gamma_{71}BLOC_{ij} \quad (4)$$

Equation 2 represents the intercept for the pregnant partner, which included a random effect and the between-individual variables representing the individual's centered between-person variables in order: hassles, daily locus of control, support receipt, support

provision, support receipt*provision and the interaction of locus of control with the support exchanges. Equation 3 represents day in study, which was not interacted with any between-person variables and did not include a random effect; the equations for phase, yesterday's mood, child age, weekend, and hassles followed this configuration. Equation 4 represents daily (within-person) support provision, which was interacted with between-person locus of control; the equations for daily support receipt and the interaction between daily support receipt and provision followed this pattern. The non-pregnant partners' Level 2 equations were configured in the same manner as the pregnant partners.

Results

The descriptive statistics for the variables of interest are listed by phase and partner in Table 1. Across the three phases, average daily locus of control was significantly higher for fathers than for mothers. There was no significant difference in negative mood for partners. The grand mean for hassles was significantly greater for fathers than for mothers. Mothers reported significantly more negative health symptoms across the course of the study than did fathers. Additionally, mothers reported significantly more positive health habits across the course of the study. There was no significant difference in the amount of support partners reported giving, however mothers reported receiving significantly more support from their partners than did fathers. There was no significant difference in the level of relationship satisfaction reported by partners. And finally, mothers reported higher levels of trait-level locus of control (as measured by Levenson's (1981) internal subscale) than their partners.

Replication of Supportive Reciprocity

H_1: Based on previous work by Gleason et al., (Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008), it was hypothesized that a participant's negative mood would increase on a day when he or she reports having received support from his or her partner but that these negative effects of received support would be buffered on days when he or she was able to reciprocate by providing support back to one's partner (supportive reciprocity). More specifically, the reciprocity pattern I expect to replicate is such that on days when a partner only receives support, he or she is expected to report his or her highest levels of negative mood. In contrast, on days when

the individual reports both receiving and providing support (supportive reciprocity days), he or she should report their lowest levels of negative mood.

Using Model 1, described above, supportive reciprocity effects for both mothers and fathers was replicated (see Table 2). For new mothers, the intercept, which represents the level of negative mood for an individual on the first weekday of the second phase of the study was equal to 0.73, $t(300) = 12.40$, $p < .001$, and for new fathers it was equal to 0.62, $t(256) = 9.51$, $p < .001$. These represent the predicted level of negative mood for a hypothetical partner, whose previous-day negative mood was at their average level, and whose own same-day hassles was at their average level. There was a significant effect of phase and day in study on negative mood for new mothers (phase: $b = 0.21$, $t(277) = 3.46$, $p \leq .001$; day in study: $b = -0.006$, $t(325) = -3.09$, $p \leq .05$) but not for new fathers such that with each phase, negative mood increases for mothers and with each day, negative mood decreases. There was a significant main effect of prior day's negative mood for both new mothers and fathers respectively ($b = -0.06$, $t(2593) = -3.50$, $p \leq .001$; $b = -0.11$, $t(2209) = -6.00$, $p \leq .001$) such that if an individual's negative mood was higher than their average yesterday, it was below their average that same day. There was also a significant main effect of hassles on negative mood for both partners (women: $b = 0.11$, $t(2599) = 12.99$, $p \leq .001$; men: $b = 0.10$, $t(2162) = 12.21$, $p \leq .001$) such that on a day when an individual reported experiencing more hassles, they also reported an increase in negative mood. There were no main effects for weekend or child's age for either partner.

The main effect of support receipt on negative mood was significant for mothers: $b = 0.07$, $t(2340) = 2.08$, $p \leq .05$; and approaching significance for fathers: $b = 0.07$, $t(2123) = 1.75$, $p = .08$ such that on a day when a partner reported only receiving support from his or her partner they also reported greater negative mood than their average. The main effect of giving support on mood was approaching significance for fathers ($b = -0.07$, $t(2008) = -1.91$, $p = .06$) such that on a day when a partner reported giving support to his partner, he also reported lower than his average negative mood. There was no significant effect of giving support for mothers. As predicted, the interaction between receiving and giving support was significant for both mothers and fathers such that on a day when one reported both receiving support from and providing support to their partner, he or she reported a significantly lower level of negative mood than their average (mothers: $b = -0.22$, $t(2315) = -4.38$, $p \leq .001$; fathers: $b = -0.17$, $t(2023) = -3.29$, $p \leq .001$). This interaction replicates Gleason et al., (Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008), in which it was found that supportive reciprocity days (days in which support is both received and provided) are associated with an individual's lowest levels of negative mood and that receipt-only days are associated with his or her highest levels of negative mood. Contrast analyses provide additional support for replication of this pattern. Analysis comparing the different support conditions (receiving support, giving support, no support, reciprocity) reveal that receipt only days have significantly different effects on negative mood than all other conditions combined for both mothers and fathers (mothers: $b = 0.11$, $t(2326) = 3.67$, $p \leq .001$; fathers: $b = 0.15$, $t(2200) = 3.72$, $p \leq .001$) and that reciprocity days have significantly different

effects on negative mood than all other support conditions combined for both partners (mothers: b = -0.17, t(2505) = - 7.35, $p \leq .001$; fathers: b = -0.17, t(2358) = - 6.48, $p \leq .001$) suggesting that, indeed, receipt only days are those of highest negative mood and reciprocity days are those of lowest negative mood. Contrast analyses comparing how mothers and fathers respond to support conditions reveal that there were no significant differences between partners. In other words, the effects of support on mood were essentially the same for mothers and fathers.

A more stringent test of supportive reciprocity effects is to use the method described in Model 2 which includes between-person variables of hassles and support. The effects were essentially the same as in Model 1 (See Table 3). For new mothers, the intercept, which represents the level of negative mood for an individual on the first weekday of the second phase of the study was equal to 0.76, t(204) = 11.59, $p < .001$, and for new fathers it was equal to 0.72, t(202) = 10.29, $p < .001$. These represent the predicted level of negative mood for hypothetical partners, whose previous-day negative mood was at their average level, and whose own same-day hassles was at their average level. There was a significant effect of phase and day in study on negative mood for mothers (phase: b = 0.17, t(234) = 2.79, $p \leq .05$; day in study: b = -0.01, t(273) = - 3.88, $p \leq .001$) but not for fathers such that with each phase, negative mood increases and with each day, negative mood decreases. There was a significant main effect of prior day's negative mood for both new mothers and fathers respectively (b = -0.57, t(2633) = - 3.29, $p \leq .001$; b = - 0.10, t(2301) = - 5.30, $p \leq .001$) such that if an individual's negative mood was higher than their average yesterday, it was below their average that same day. There

was also a significant main effect of hassles on negative mood for both partners (women: $b = 0.12$, $t(2666) = 13.76$, $p \leq .001$; men: $b = 0.11$, $t(2262) = 12.34$, $p \leq .001$) such that on a day when an individual reported experiencing more hassles, he or she also reported an increase in negative mood. There were no main effects for weekend or child's age for either partner.

The main effect of support receipt on negative mood was approaching significance for both mothers: $b = 0.06$, $t(2322) = 1.90$, $p = .057$; and fathers: $b = 0.07$, $t(2192) = 1.68$, $p = .09$ such that on a day when a partner reported only receiving support from his or her partner they also reported greater negative mood than their average. There was a significant main effect of giving support on mood for fathers ($b = -0.07$, $t(2046) = -1.98$, $p \leq .05$) such that on a day when a partner reported giving support to his partner, he also reported lower than his average negative mood. There was no significant effect of giving support for mothers. Again and as predicted, the interaction between receiving and giving support was significant for both mothers and fathers such that on a day when one reported both receiving support from and providing support to their partner, he or she reported a significantly lower level of negative mood than their average (mothers: $b = -0.19$, $t(2276) = -3.89$, $p \leq .001$; fathers: $b = -0.17$, $t(2084) = -3.31$, $p \leq .001$) again replicating Gleason et al., (Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008) even while isolating the within-person effects of support exchanges from the between-person effects (see Figure 1). This interaction along with the contrast analyses indicate that, for both partners, supportive reciprocity days are associated with an individual's lowest levels of negative mood (mothers: $b = -0.16$, $t(2470) = -6.89$, $p \leq$

.001; fathers: b = -0.17, t(2413) = -6.61, $p \leq .001$) and that receipt-only days are associated with his or her highest levels of negative mood (mothers: b = 0.11, t(2304) = 3.65, $p \leq .001$; fathers: b = 0.15, t(2279) = 3.72, $p \leq .001$). Contrast analyses were conducted to determine if partners experienced support transactions differently from one another and revealed no significant differences.

Recall that this model includes the grand means of giving and receiving support as well as their interaction enabling examination of the between-person effects of support transactions. Significant between-person effects were found for both receiving and giving support for fathers (receiving: b = 0.57, t(74) = 2.33, $p \leq .05$; giving: b = -0.58, t(73) = -2.23, $p \leq .05$). This indicates that fathers who on average received more support, experienced greater than average negative mood and that those who gave more on average experienced lower than average negative mood. Significant between-person reciprocity effects were also found for new fathers (b = - 1.28, t(68) = - 2.66, $p \leq .05$) but not for new mothers. This indicates that fathers who both received and gave more support across the course of the diary periods experienced the lowest levels of negative mood on average (supportive reciprocity as an average effect).

Finally, Model 3 tested whether these effects varied by phase. Recall that this model includes phase interacted with all of the variables in the previous model (i.e., phase was interacted with every variable other than itself in equation 1 above). There was no significant interaction effect for phase and reciprocity for fathers and was only approaching significance for mothers suggesting that the expected supportive reciprocity pattern persists across the course of the study and across person (see Tables 4a and 4b).

These effects were investigated further using, separately, all phases as referent groups. Analyses revealed a marginal effect for reciprocity in phase one for women and a marginal effect for men in phase three (see Figure 2). All other within-person reciprocity effects remained significant. As the figure shows, supportive reciprocity days were still the days of lowest negative mood across all three phases for both mothers and fathers. I did find a significant interaction with phase and receipt of support for mothers ($b = 0.08$, $t(2733) = 2.12$, $p \leq .05$) such that receipt only days were not associated with more negative mood for the mothers when they were in their third trimester, but as stated, there was still a reciprocity effect such that days on which mothers reported receiving and giving were associated with their lowest negative mood. Because phase did not change the overall findings, it was dropped from the remaining analyses to preserve power.

Moderation of Supportive Reciprocity

H_2: It was hypothesized that an individual's sense of control (both state- and trait-level) would moderate the effects of the support process on an individual's mood. Generally, it was expected that an individual's sense of control would moderate the support process such that greater levels of control would decrease the association between support patterns and negative mood. Specifically, it was expected that the negative effects of support receipt would be alleviated on days when an individual reports greater levels of personal control. Or, to put it differently, because I think that the act of providing support to one's partner allows people to experience some sense of control, on days when the individual reports a higher level of control, giving shouldn't be necessary to alleviate the negative effects of receiving support. On these days of higher levels of

control, receiving support should not influence mood in a negative way. Therefore, it was expected that the benefits of supportive reciprocity (both giving and receiving) would be evident only on days when an individual reports lower levels of control than their average.

Using Model 4, I examined the effects of locus of control on the effects of support transactions on mood. The effects of the covariates were essentially the same as in the previous analyses (see Tables 5a and 5b for coefficients). The main effects of daily control were significant for both partners (mothers: b = -0.34, t(2498) = -13.15, $p \leq .001$; fathers: b = -0.28, t(2346) = -9.52, $p \leq .001$) such that on a day when a partner experienced higher than their average sense of control they also experienced lower negative mood. As expected, the between-person effects of control on negative mood were significant for both mothers and fathers respectively (b = - .30, t(82.3) = - 2.55, $p \leq .05$; b = - .50, t(88.3) = - 5.04, $p \leq .001$) such that those individuals with a generally higher sense of control across the diary periods experienced lower levels of negative mood across the course of the study. With daily personal control in the model, the basic reciprocity pattern holds for mothers (b = -0.12, t(2412) = - 2.52, $p \leq .05$) but not for fathers. The main effects of giving and receiving support were no longer significant for either partner.

As expected, personal control was found to moderate the effects of supportive reciprocity on negative mood significantly for both partners (mothers: b = 0.19, t(2303) = 2.85, $p \leq .05$; fathers (b =0.16, t(1991) = 2.16, $p \leq .05$) such that on days when a partner experienced lower than their average sense of control, the pattern of supportive

reciprocity was present but that on days when a partner experienced greater than their average sense of control, these patterns no longer persist. A significant interaction was found between control and giving support for mothers (b =-0.11, t(2539) = -2.01, $p \leq .05$) and a significant interaction was found between control and receiving support for fathers (b =-0.12, t(1989) = -2.06, $p \leq .05$). Contrast analyses were used to determine if partners experienced support transactions differently from one another and revealed no significant differences. Figure 3 illustrates the effects of support at low (-1 *SD*), average, and high (+1 *SD*) levels of control for each partner across the three phases of the study.

To examine these effects further, I re-centered daily locus of control to represent either low daily control or high daily control (+/- 1 *SD*) and substituted these new variables for daily locus of control in Model 4. I was interested in whether the effects of reciprocity were the same for a low control day versus a high control day. I found that for low locus of control days, significant main effects for reciprocity were still present for both partners (mothers: b = -0.19, t(2469) = - 3.35, $p \leq .001$; fathers: b = -0.17, t(2207) = - 2.60, $p \leq .05$). I also found that for high locus of control days, these effects were no longer present for either partner. The contrast effects for these analyses suggest that the effects of reciprocity days remain significantly different from the effects of the remaining support conditions only for low control days (mothers: b = -0.18, t(2535) = - 6.86, $p \leq .001$; fathers: b = -0.16, t(2383) = - 4.94, $p \leq .001$). There were no significant differences between the effects of the different support conditions on mood for high control days. Taken together, these findings support the notion that daily locus of control does buffer the effects of support on mood. Phase effects were examined and revealed no significant

effects of phase on this moderation of supportive reciprocity suggesting that these patterns remain consistent across the course of the study.

Recall that Model 4 includes the grand means of all variables allowing for examination of average daily control across the study (trait-level) as a moderator of daily supportive reciprocity. As expected, there was a significant interaction effect of trait-level control and within-person supportive reciprocity for both mothers and fathers respectively (mothers: $b = 0.25$, $t(2401) = 2.68$, $p \leq .05$; fathers: $b = 0.39$, $t(2241) = 3.92$, $p \leq .001$), such that for individuals with lower than average levels of control, the pattern of supportive reciprocity holds, but for those high in control, supportive reciprocity is not associated with lower negative mood.

Because I was interested in the differential effects for those with a low average locus of control versus those with a high average locus of control, I re-centered the grand mean of daily locus of control to reflect either those with below average locus of control or those with above average locus of control across the study. High average and low average were then substituted separately into Model 4. These analyses reveal that while the effect of reciprocity on mood is still significant for partners with low average levels of control (mothers: $b = -0.25$, $t(2450) = -4.19$, $p \leq .001$; fathers: $b = -0.29$, $t(2236) = -4.47$, $p \leq .001$), it completely falls away for those with higher levels of control. The contrast effects for these analyses reveal that there were no significant differences on mood for support conditions for those partners with higher than average locus of control however, those with below average control did experience support conditions differently. Both mothers and fathers in this latter group experienced significantly lower negative

mood on reciprocity days than they did for all other support conditions (mothers: b = -0.19, t(891) = -4.34, $p \leq .001$; fathers: b = -0.32, t (710) = -7.19, $p \leq .001$).

Again, for fathers, but not mothers, there was evidence of a between-person supportive reciprocity effect (fathers: b = -1.05, t(63.6) = -2.19, $p < .05$), but there was no evidence that it was moderated by between-person daily locus of control.

Model 5 is identical to Model 4, but trait-level locus of control as measured by Levenson's (1981) internal subscale is substituted for the between-person centered daily locus of control. The basic supportive reciprocity pattern holds for both parents (b = -0.27, t(4835) = - 5.14, $p \leq .001$; b = -0.24, t (4828) = -4.27, $p \leq .001$). Contrary to expectations however, there were no significant interaction effects of this measure of trait locus of control and supportive reciprocity (see Tables 6a and 6b for coefficients).

The Effects of Support on Health Outcomes

H_3: It was hypothesized that an individual's sense of control (both trait- and state-level) would moderate the effects of the support process on an individual's reported health symptoms and healthy habits. Generally, it was expected that an individual's sense of control would moderate the support process such that greater levels of control would be associated with fewer negative health symptoms and more reported healthy habits.

Negative Health Symptoms

Because I'm interested in the potential moderation of the support process on negative health symptoms, I am primarily interested in investigating Model 4. However, first I tested whether there was evidence that support exchanges influenced individuals' negative health symptoms and found that a supportive reciprocity similar to that found

for negative mood was present, but only for fathers (Model 2). I then tested whether this pattern varied by phase for mothers or fathers and found, again, that it did indeed vary for fathers, but not mothers. Given these findings, Model 4 was run retaining phase effects to determine whether daily within- and between-locus of control moderated these patterns (see Tables 7a & 7b). In the interest of both brevity and clarity, only the results from Model 4 are reported.

For new mothers, the intercept, which represents the level of negative health symptoms for an individual on the first weekday of the second phase of the study was equal to 1.28, $t(158) = 10.92$, $p < .001$, and for new fathers it was equal to 1.04, $t(195) = 10.02$, $p < .001$. These represent the predicted level of negative health symptoms for a hypothetical partner, whose previous-day negative health symptoms was at his or her average level, and whose own same-day hassles was at his or her average level at the start of the second phase. There was a significant main effect of phase on negative health symptoms for new mothers ($b = - 0.64$, $t(286) = - 6.13$, $p \leq .001$) such that negative health symptoms decreased across the course of the study. There was also a significant effect of child's age for new mothers ($b = 0.002$, $t(258) = 4.92$, $p \leq .001$) such that with there was a very small increase in negative health symptoms with child age. There was no effect of phase or child's age for new fathers. There was a significant effect of day in study on negative health symptoms for new fathers ($b = - 0.01$, $t(316) = - 2.28$, $p \leq .05$) but not for new mothers such that with each day, negative health symptoms decreased slightly for men. There was a significant main effect of prior day's negative health for both new mothers and fathers respectively ($b = -0.05$, $t(2591) = -2.88$, $p \leq .05$; $b = -0.04$,

$t(2366) = -2.25$, $p \leq .05$) such that if an individual's negative health symptoms were greater than their average yesterday, they were less than their average that same day. There were no main effects of weekend or hassles for either partner.

There was a significant main effect of receiving support for men ($b = 0.29$, $t(2087) = 5.08$, $p \leq .001$) such that on a day when one reported receiving support from their partner, he experienced greater than his average negative health symptoms. There was also a significant effect of reciprocity for fathers ($b = -0.27$, $t(2016) = -3.79$, $p \leq .001$). Figure 4 illustrates the different effects of reciprocity on health for mothers and fathers. When examining phase effects, I found a significant effect of phase on receiving support for fathers ($b = 0.19$, $t(2025) = 2.83$, $p \leq .05$) such that the effects of receipt of support are non-significant in phase one but are significant in phases two and three. Similarly, the phase effect on reciprocity was approaching significance for the fathers ($b = -0.17$, $t(2089) = -1.92$, $p = .05$) such that the effects of supportive reciprocity were non-significant in phase one but were significant in phases two and three.

There was a significant interaction between receiving support and control on health for fathers ($b = -0.21$, $t(1785) = -2.66$, $p \leq .05$) such that on a day when a partner reported receiving support and a greater than their average sense of control, he reported fewer negative health symptoms. When examining the phase effects, I found an interaction between phase, control, and reciprocity that was approaching significance for fathers ($b = -0.22$, $t(1760) = -1.91$, $p = .06$). Further investigation of the phases independently revealed that the influence of control on reciprocity was strongest during the third trimester and not at all significant during infancy or toddlerhood (see Figure 5).

As the figure shows, during the third trimester, the reciprocity effects on negative health look to be following the expected pattern on days when one experiences lower levels of control however, on high control days, the effects of all support conditions appear to be essentially the same.

Recall that Model 4 includes the grand means for all variables. A significant interaction between average daily control and grand mean reciprocity on health symptoms was found for women (b = -4.57, t(68.8) = -2.40, $p \leq .05$) such that for one who reports a greater average number of reciprocity days and a greater level of control across the study, she also reports fewer negative health symptoms. There were no other effects of trait-level control on negative health symptoms.

Contrary to expectations, Model 5, which substitutes Levenson's (1981) internal locus of control scale for the grand mean centered daily locus of control, revealed no significant interactions between control and support transactions (see Tables 8a & 8b).

Positive Health Behaviors

As with the investigation of negative health behaviors, my primary interest is in Model 4, but first Model 2 and Model 3 were run to test for basic reciprocity effects across and within phase respectively. Supportive exchanges do not appear to be important for positive health behaviors in either of those models. I report on Model 4 (retaining phase) which tested for the possibility of moderation as it is possible that support would be found to be predictive when locus of control was included in the model. However contrary to my hypothesis, support exchanges were not in themselves influential on positive health behaviors nor did they interact with locus of control. The effects of the

support process on positive health behaviors from Model 4 are reported in Tables 9a and 9b. For new mothers, the intercept, which represents the level of positive health behaviors for an individual on the first weekday of the second phase of the study was equal to 1.62, $t(150) = 14.11$, $p < .001$, and for new fathers it was equal to 1.66, $t(158) = 13.52$, $p < .001$. These represent the predicted level of positive health behaviors for a hypothetical partner, whose previous-day positive health behaviors was at their average level, and whose own same-day hassles was at their average level at the start of the second phase. There was a significant main effect of phase on positive health behaviors for new mothers ($b = - 0.74$, $t(117) = - 7.19$, $p \leq .001$) such that positive health behaviors decreased across the course of the study. There was also a significant effect of child's age for new mothers ($b = .002$, $t(103) = 5.94$, $p \leq .001$) such that as the child got older there was an increase in positive health behaviors. There was no effect of child's age for new fathers. There was a significant effect of day in study on positive health behaviors for new mothers ($b = - 0.01$, $t(110) = - 3.21$, $p \leq .05$) but not for new fathers such that with each day, positive health behaviors decreased. There was a significant main effect of weekend for both partners (mothers: $b = - 0.09$, $t(2553) = - 2.48$, $p \leq .05$; fathers: $b = - 0.12$, $t(2370) = -3.20$, $p \leq .05$) such that partners reported fewer positive health behaviors on weekends. There was a significant main effect of prior day's positive health for fathers ($b = -0.05$, $t(2261) = - 2.71$, $p \leq .05$) such that if one reported more than his average positive health behaviors yesterday, he reported fewer than their average that same day. There were no main effects of hassles for either partner nor were there any significant main effects of support transactions on positive health behaviors for either partner.

There was a significant main effect of control on healthy behaviors for both partners (mothers: $b = 0.34$, $t(2260) = 6.91$, $p \leq .001$; fathers: $b = 0.31$, $t(2304) = 5.81$, $p \leq .001$) such that on a day when one reports a greater daily locus of control than their average, they also report engaging in more healthy behaviors that same day. There was also a significant main effect of daily average control on healthy behaviors for fathers ($b = 0.67$, $t(70) = 3.92$, $p \leq .001$) such that for those who report above average control across the study he or she also reports engaging in more positive health behaviors.

Contrary to expectations, there were no significant interactions between control and support transactions. Additionally, contrary to expectations, Model 5, which substitutes Levenson's (1981) internal locus of control scale for the grand mean centered daily locus of control, revealed no significant interactions between control and support transactions.

Discussion

The aim of this study was three-fold: First, to theoretically replicate the supportive reciprocity patterns established by Gleason et al., (2003, 2008), second, to determine the role that locus of control plays in these processes and third, to examine the influence that daily support and control have on theoretically relevant health outcomes.

Using multilevel models, I examined first, the within-person effects of support transactions on mood controlling for yesterday's negative mood, daily hassles, day in study, child's age, weekend, and phase (Model 1). Next, centered grand mean variables for the constructs of interest were included as this allows for the isolation of the within-person effects from the between-person effects. No differences were found in the basic effects of supportive reciprocity on mood when running these two models. I also ran a model interacting phase with all variables and found no significant interaction effects (Model 3). However, I did examine each phase independently and discuss any meaningful differences below.

Similar to the findings of Gleason et al. (Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008), the results suggest that supportive reciprocity in close relationships is important for an individual's daily negative mood. In other words, with the exception of the third trimester for women, I found that on days when an individual reported only receiving support from their partner (not providing) his or her negative mood was at their highest level but on days when they were able to reciprocate, the act of providing support seemed to buffer the negative effects of receiving support. Contrast analyses for the effects of support transactions further support the hypotheses.

When comparing the effects of the various support conditions (i.e., receiving only, no support, giving only, and reciprocity) on negative mood, receipt only days were found to be significantly different from all other conditions for both partners confirming that those were their days of greatest negative mood. Reciprocity days were also found to be significantly different from the rest of the support conditions confirming that those were the days that individuals reported experiencing their lowest levels of negative mood.

As mentioned above, women in their third trimester of pregnancy experienced receiving support differently than during infancy or toddlerhood. During this phase, women did not experience the negative effects of only receiving support. This is not surprising considering the physically-burdened state of the mother-to-be at this point. Perhaps because the third trimester is physically limiting, a mother-to-be might attribute the need for support to her physical condition instead of a maladaptive cognitive appraisal of her capabilities. Additionally, there may be a shared sense of responsibility for her physical condition, which might limit the negative effects of receipt of support from her partner on mood. Meaning, an expectant mother might feel deserving of any support provided to her by her partner (who is, presumably partially responsible for her condition) and therefore not be negatively affected by these acts. The significant effects of received support on mood once the baby has arrived may speak to the cognitive appraisal of her abilities in her new role as mother. In other words, once the baby arrives, if a new mother is feeling inefficacious or incapable in her new role as mother, she may then experience the negative effects of receiving support. While men experienced significant effects of receipt of support in phases one and two, the effects were only

marginal during toddlerhood. Given that there was no significant interaction effect for phase and reciprocity indicating that this pattern remained consistent across all three phases and that there may be insufficient power in phase three due to attrition, further investigation of new fathers across this transition is required before any speculation is made concerning this difference.

Recall that Model 2 included the grand means of all variables allowing for examination of between-person effects of support transactions. The pattern of reciprocity was found to hold true at the between-person level, at least for fathers. The findings indicate that fathers who on average receive more support across the study also report more negative mood across the study and those that give more support across the study report experiencing less negative mood across the study. There appears to be some sort of cumulative buffering effect for men but not for the women in my sample. This may be due, in part, to the fact that women did not experience significant negative effects of receipt of support in the first trimester.

Although Gleason, et al. (2008) found the above-mentioned pattern of reciprocity to be evident on average, they also found considerable variation in the way that individuals responded to receiving support. These researchers and others have speculated that individual personality factors may be the reason for these differences (e.g., self-esteem or self-efficacy). My results document that, indeed, an individual's sense of control may act to mitigate the negative effects of receiving support. Again, multilevel models were used to examine the potential buffering effects of control on the support process. As expected, it was determined that on days when a partner experienced greater

levels of control than his or her average, giving support was not necessary to alleviate the negative effects of receiving support. In fact, it was found that on high control days individuals reported their lowest levels of negative mood regardless of their support transactions. These effects may be best understood when we consider a day when an individual reports his or her lowest levels of control. On these days, as posited, receiving support may act to highlight a stressor leaving the recipient feeling incapable or inefficacious in controlling the events in his or her life resulting in an increase in negative mood. On these same low control days, if he or she is able to provide support to their partner, thereby demonstrating efficacy or control, the negative effects of receiving support are alleviated such that he or she reports their lowest levels of negative mood (for low control days). On high control days however, an individual's sense of control is likely not challenged thereby buffering the negative effects of receiving support. According to control theory (Rotter, 1982), individuals with a more internal sense of control tend to have better coping strategies when faced with a stressor. Because they believe their own actions are what determine their outcomes, internals behave more proactively when anticipating a stressor and may be more likely to solicit support from their partner. In this case, received support has been a result of their own actions as they have enlisted their partner's help and is less likely going to negatively influence their mood. Their sense of control may be influencing not only the effects of support but the reason the support became available.

To investigate these effects further, I re-centered daily locus of control to represent either +/- 1 *SD* and ran the model separately for each. This way I could

compare the contrast effects of the various support conditions for high versus low control days. Consistent with the results from the previous analysis, the basic supportive reciprocity pattern was evident for those days with lower than average control and was not present on days of greater than average control supporting the notion that locus of control does buffer the effects of the support process and that it does so on a daily basis. Contrast effects provided further support for this. While there were significant differences for the effects of essentially all of the support conditions (independently and combined) on negative mood for days with below average control, there were no significant differences for days of above average control. In other words, on above average days of control, support transactions do not differentially affect mood whereas they do on below average days of control. I did examine phase effects to determine if these patterns were influenced by the stage of the transition and found no effects of phase on the moderation of the support process.

Next, because this model included the grand means for all variables, I was able to examine the between-person effects of control on the within-person effects of the support process using the average daily locus of control across phases as a measure of trait-level control. First, results suggest that individuals with a higher than average locus of control across the study experience lower levels of daily negative mood regardless of support transactions. And, as expected, there was a significant interaction between trait-level control and daily support processes on mood for both partners such that for individuals with lower than average levels of control, the pattern of supportive reciprocity holds, suggesting that giving back is necessary to buffer the negative effects of receiving

support. For those high in control however, supportive reciprocity is not associated with lower negative mood. To get a better understanding of how this process might influence individuals with high versus low locus of control differently, I ran the above model, re-centering the grand mean of average daily control, referencing those 1 *SD* above the mean and those 1 *SD* below the mean independently. While the basic reciprocity effects were still significant for those with below average levels of control across the study, the basic reciprocity pattern no longer exists for those with above average levels of control suggesting that trait-level control buffers the effects of the daily support process on mood. In fact, the contrast analysis comparing different support conditions for each of these analyses best illustrates the difference between individuals with high trait-level locus of control versus those with low trait-level locus of control and the way they experience support. While the significant differences between support conditions remained for those with low average locus of control, the effects fell completely away for those with higher levels of locus of control suggesting that the support conditions do not differentially affect those with a higher than average sense of control. In other words, for those with higher average locus of control, receiving support was not detrimental to mood nor was reciprocity beneficial.

The final analysis concerning the potential moderating effects of locus of control on the support process involved Levenson's (1981) well-established measure of internal locus of control (Model 5). Contrary to my expectations, this measure of trait-level locus of control did not predict the effects of the support process on mood. The lack of association found was unexpected given the research (albeit limited) linking general

measures of control to support and stress (Lefcourt, Martin, & Saleh, 1984; Sandler & Lakey, 1982). Perhaps the lack of association can be understood in the context of how typical locus of control research is conducted. Typical control research has used cross-sectional designs in which participants are asked to report on their locus of control using a retrospective measure and then comparing that with behaviors in a lab setting or using post-intervention surveys. Social learning theory would suggest that one's locus of control is learned over time based on our contingency experiences with stressors (Rotter, 1982). Therefore, retrospective surveys measuring one's sense of control broadly are likely influenced by a lifetime of experiences as well as by social desirability effects or by an individual's feelings at the time of the survey. In the current study, these effects are minimized by asking about in-the-moment (daily) control along with daily mood. It makes sense that these daily accounts of one's cognitions would be more predictive of the effects of daily support processes than Levenson's measure of locus of control (1981).

My last aim was to determine the extent to which daily support processes and daily control were associated with theoretically related health constructs. Because, generally speaking, those with a more internal sense of control tend to report more positive health outcomes than those with an external locus of control (Cunningham, Lockwood, & Cunningham, 1991; Ell, Nishimoto, Morvay, Mantell, & Hamovitch, 1989; Lewis, 1982), and because there are mixed findings concerning health and support (Uchino, 2004), it was anticipated that locus of control would be associated with individual effects of the support process on health.

Again, multilevel analysis was used to model health as a function of the prior day's corresponding health variable, daily hassles, day in study, child's age, weekend effects, phase, and daily support transactions (Model 4). Analyses reveal that support transactions influence negative health symptoms similarly to the way that the process influences mood for fathers only. On a day when a partner receives support only, he reports his greatest level of negative health symptoms. This can be explained in similar terms to the effects of received support on mood such that receiving support may act to highlight a recipient's need or incapability leaving them feeling less well. However, this association may simply be a result of a recipient's need for support based on their physical health. I also found a significant reciprocity effect on negative health symptoms for fathers suggesting that the negative effects of receiving support on health are reversed on days when he is able to give support back to his partner. Similar to the effects of receiving support, this may be explained by the notion that one is able to provide support best when one is experiencing fewer negative health symptoms.

To further examine whether or not a person's sense of control influences the way support is associated with negative health symptoms, I looked at the interaction effects for control and the various support conditions. It was found that on a day when a father reported a greater sense of control and only receiving support he reported fewer negative health symptoms than his own average. It was also found that the reciprocity effects were differentially influenced by control for the different phases. As Figure 5 shows, during the third trimester, the reciprocity effects on negative health look to be following the expected pattern on days when one experiences lower levels of control however, on high

control days, the effects of all support conditions appear to be essentially the same. It also appears that the reciprocity patterns are evident in the remaining phases for both high and low control days. Further investigation of the contrast effects for this four-way interaction is necessary to gain a better understanding of how this moderation is different across phases. Overall, however, fewer negative health symptoms are reported on days when fathers report higher levels of control than those days of lower control.

Finally, using the same model, the potential moderating influence of control on the effects of the support process on healthy habits was investigated. Contrary to predictions, there were no main effects of support transactions on healthy habits meaning that supportive acts between partners did not influence the healthy behaviors he or she engaged in. However, there were significant main effects of control on behavior supporting prior research suggesting that the more in control an individual feels the more likely they are to engage in healthy behaviors as they recognize that their health is within their control and therefore demonstrate preventative behaviors. There was a significant interaction between control and receiving support for fathers such that on a day when one reported receiving support and a greater than their own average sense of control he also reported engaging in fewer healthy behaviors. Since this was the only significant interaction, and it is contrary to expectations, I'll limit speculation to the following: if a partner is feeling ill and requiring support, he may not necessarily feel out of control. He may just feel ill enough to not engage in healthy habits like exercise and eating a well-balanced diet leaving control and receiving support associated with fewer healthy behaviors.

In conclusion, it appears that support transactions along with an individual's sense of control have important influences on mood. These findings contribute to the research concerning both support as well as personality in important ways. First, an important finding is the replication of supportive reciprocity across this important transition. Despite the fact that this is a largely disruptive event in the lives of couples in terms of contextual roles (i.e., first-time mother and father) and emotional well-being (e.g., stress, mood, depressive symptoms) (O'Hara & Swain, 1996; Paulson, Dauber, & Lieferman, 2006; Perren, Von Wyl, Burgin, Simoni, & Von Klitzing, 2005), my data show that the interpersonal process of support has consistent effects across this stressor. This adds to the existing literature in that these established patterns of support on mood are evident in individuals as they transition to new, life-long roles. Understanding that this population is interacting with their partners consistent with other populations within other contexts helps solidify this foundation of knowledge.

Another important contribution to the literature concerning the support process is the finding that control buffers the effects of the support process at both the state and trait (average daily) level. Just as the effects of support were found to be consistent across this transition, I also found both trait and state level of control to buffer these effects in essentially the same way across this transition. In general, the negative effects of the support process are buffered for those individuals in my sample with above average locus of control (trait level). What this means is that while those with a greater sense of control are protected from the potential negative effects of support, those with average to below-average levels of control are at greater risk of the detrimental effects of this process. The

state-level findings, however, suggest that, on a given day, if one experiences greater control than their average, receiving support should be less detrimental than on an average day. Reciprocity theory suggests that it is feeling over-benefitted that elicits the negative feelings associated with inequitable conditions (Fehr, Kirchsteiger, & Riedl, 1993). If this were the case, I would expect to see the negative effects of receiving support (feeling over-benefitted) regardless of control. My findings suggest that lack of reciprocity or feeling indebted to one's partner is not the primary reason for why support is negative rather that feeling incompetent and less in control is leading to the negative feelings. Reciprocity is still important for alleviating the negative effects of support but only for those with lower trait levels of control or on days when an individual is feeling less in control than their average. And, the effects of reciprocity are likely a result of demonstrating competence or capability rather than a result of eliminating feelings of indebtedness.

It's important to point out that the effects found to be associated with receiving support on a single day are relatively small. And although these negative effects may seem relatively inconsequential, one must consider the potential cumulative nature of such effects and the subsequent influence this accumulation of negative effects might have on either the relationship or the individual. As mentioned earlier, the transition to parenthood is considered one of the more stressful events an individual can face in his or her lifetime (Cowan & Cowan, 2000) involving a lengthy adjustment period that often gives rise to symptoms of depression and stress for new mothers and new fathers (O'Hara & Swain, 1996; Paulson, Dauber, & Lieferman, 2006; Perren, Von Wyl, Burgin, Simoni,

& Von Klitzing, 2005). Not unlike the notion set forth by numerous researchers concerning the influence that stress has on the dyad and the long-term impact of stress on maladaptation (e.g., Bodenmann (2005) and Karney & Bradbury (1995)), in the long run, the additive effects of receiving support could lead to a growing sense of dissatisfaction with the relationship. Specifically, negative mood experienced by one partner could distort perceptions of interactions with his or her partner, leading to increases in negative mood and maladaptive responses. It seems important to understand if the negative effects of support are cumulative and further how this might contribute to the psychological distress associated with this transition as well as other life events.

Researchers have questioned the validity of personality assessment arguing that personality measures themselves are invalid because they reflect state affect rather than trait variance (Reich et al., 1987). There are two ways in which researchers consider this dilemma. Some argue that personality traits are, by definition, highly stable and that any measure that is influenced by changes in affective state is invalid as a trait measure. Others call into question the idea that personality is stable (Reich, Noyes, Coryell, & O'Gorman, 1986; Santor, Bagby, & Joffe, 1997). In fact, a more recent trend in personality research suggests considering the extent to which individuals vary on a given trait as a potential predictor. According to Fleeson (2001), while people have a highly stable typical level at which they manifest a given trait, most of the time people are not exhibiting the trait at that level. Instead, most of the time people manifest the trait in their behavior to a lesser or greater degree than is typical for them, often quite a bit lesser or greater. For example, extraverts often act introverted and introverts often act extraverted.

That is to say that people are acting "out of character" most of the time. Findings based on the current sample support the notion that individuals exhibit considerable variation on a daily measure of control (Ryon & Gleason, 2014). In fact, it is the daily measure and the mean of that daily measure that is more highly associated with theoretically related outcomes (e.g., health outcomes) than a well-established trait-level measure of locus of control (i.e., Levenson's internal subscale, 1981). Future research should consider state-level measures as it is likely these state-levels that better predict in-the-moment behavior.

Limitations

There are several factors that limit the interpretation of the current results. It is important to emphasize that the data reported are correlational, and thus I am unable to make strong causal inferences, particularly for same-day effects. Furthermore, I developed the daily locus of control measure for use in this study and have not previously established it as a valid measure of locus of control. However, it was found to be predictive of health outcomes as would be expected given previous work concerning locus of control. Despite this predictive value, average locus of control over the course of the study is not correlated with trait locus of control as measured in the background survey even though the daily items are derived in part from Levenson's (1981) scale. Therefore, these findings may not generalize beyond this particular control measure.

Although one of the aims of this paper is to examine the effects of support across a major life transition, this sample of couples expecting their first child limits the extent to which I can generalize the findings to other transitions. My findings suggest that for women in their third trimester of pregnancy, the burden of carrying a baby and the stress

associated with an impending birth influence support and the associated variables differentially than for new mothers and fathers. However, given that women and men have nearly identical patterns concerning the buffering effects of control on the support process, these results may generalize beyond first-time parents. Finally, given the population of interest and the recruitment method used, the sample size is modest and is at risk of a self-selection bias.

Implications and Future Directions

The current study has broad implications for understanding support and the influence that personality has on this process. Researchers of support have often speculated that individual personality factors such as self-esteem, self-efficacy, and control contribute to the variability with which individuals respond to support. In line with the cognitive-affective processing model (Mischel & Shoda, 1995), it appears that perceptions of control do, indeed, play an important role in how one responds to support. And since all variation in the way individuals respond to support transactions can not be accounted for by control, future work should investigate what other individual characteristics influence this process. Although replication is necessary, this work suggests that any research concerning support transactions should include a measure of control.

This work contributes to the field through the use of a longitudinal daily diary. This type of design allows us to not only determine between-person differences but to establish within person patterns of behavior as individuals and couples navigate life's major events. Considering locus of control at the daily level, using these methods, allows

for further investigation of the associations between this construct and the many variables that have long been linked to trait-level control. An important next step would be to determine further how state- and trait-level locus of control might differentially influence these well-established associations. Additionally, given the considerable variation that people do exhibit on various constructs (e.g., control, extraversion) perhaps the degree to which individuals vary has meaningful consequences for related outcomes and perhaps this variability says something important about personality. As Fleeson's work (2001) suggests, variation in state-level control may be a better indication of personality than the well-established measure of locus of control (Levenson, 1981) that was used in this study. The current dataset consists of nine weeks of daily measures of locus of control which facilitates investigation of this variability as a predictor of theoretically relevant outcomes. A possible next-step in understanding this variability would be to determine what classic personality traits are associated with it. For instance, do those who score higher on the neuroticism scale exhibit more variability or instability in control? And consequently, does the degree of variability predict things such as how malleable ones overall sense of control is or how quickly individuals adapt to stressors?

Because we know, based on recent work (Ryon & Gleason, 2014), that control does operate at the state level and that it is associated with reports of daily experiences, it stands to reason that there is potential to influence these cognitions on a daily basis. Knowing that an individual's daily sense of control can buffer the negative effects of receiving support both in-the-moment and across time can help us build more informed interventions to help couples navigate important life transitions such as becoming

parents. For instance, incorporating cognitive restructuring techniques into prenatal workshops would be a cost-effective method to increase important perceptions of control for first-time parents. Not only would this help safe-guard their daily mood but would likely protect them in terms of their mental health. In addition to this work and that of Keeton, et al., (2008) discussed above, there is some evidence that locus of control is, indeed, highly responsive to experiences. Various educational and psychological interventions aimed at both children and adults designed to strengthen the tie between behavioral choices and outcomes have been found to increase reports of internal locus of control (Hans, 2000; Hattie, Marsh, Neill & Richards, 1997; Krampen, 1987). Therefore, because a more internal sense of control increases the likelihood of taking action (Rotter, 1982), teaching new parents how to maintain or enhance their sense of control may help them maintain their relationship well-being throughout this and other major life events. To date, intervention work aimed at improving or teaching support skills has been scarce probably based on the patchy record of effectiveness for the process of support (see review by Rafaeli & Gleason, 2009). Because the way that individuals interact with one another is influenced by intrapersonal characteristics and cognitions (Lakey & Drew, 1997), it seems reasonable to address these forces in an attempt to more effectively improve interpersonal skills.

And finally, because the buffering effects of control were evident for those approaching a stressor (third trimester), for those experiencing an acute stressor (infancy), and for those adjusting to a new role (toddlerhood), it seems reasonable to speculate that these effects might be evident within different contexts requiring support as

well. Future research should continue to investigate the role that intrapersonal characteristics play in this important interpersonal process as well as other processes such as conflict. Given the importance of these types of interactions within relationships, healthy marriage and relationship initiatives may prove to be more effective once we are better informed as to how individual characteristics influence these processes.

Appendix

Table 1
Means and Standard Deviations

	Phase One		Phase Two		Phase Three	
	Mothers	*Fathers*	*Mothers*	*Fathers*	*Mothers*	*Fathers*
Daily Personal Control						
M	2.82**	2.95**	2.69	2.66	2.70	2.68
SD	(0.82)	(0.79)	(0.77)	(0.80)	(0.81)	(0.79)
Levenson's Locus of Control	36.36*	36.81*	37.12**	36.24**	40.21**	39.12**
M	(5.26)	(5.16)	(5.47)	(5.30)	(6.59)	(5.66)
SD						
Daily Hassles						
M	0.98**	1.24**	1.28	1.38	1.10	1.17
SD	(1.12)	(1.43)	(1.37)	(1.49)	(1.18)	(1.17)
Daily Negative Mood						
M	0.39*	0.45*	0.54	0.53	0.44	0.45
SD	(0.52)	(0.59)	(0.65)	(0.68)	(0.60)	(0.63)
Daily Negative Health Symptoms	1.66**	0.95**	1.39**	1.09**	1.34**	0.99**
M	(0.93)	(0.88)	(0.97)	(0.83)	(0.91)	(0.81)
SD						
Daily Positive Health Behaviors	2.01**	1.84**	1.63	1.60	1.71**	1.51**
M	(0.94)	(1.08)	(1.02)	(1.05)	(1.06)	(1.01)
SD						
Relationship Satisfaction	73.52*	71.44**	65.45	65.68	64.06	64.16
M	*	(7.40)	(17.21)	(13.45)	(14.79)	(11.66)
SD	(7.09)					

Note: Average Daily Personal Control scores could range from 0 to 4. Internal Locus of Control could range from 0-48. Average Daily Hassles could range from 0-8. Average Daily Negative Mood scores could range from 0 to 4. Average Daily Negative Health Symptoms could range from 0-4. Average Daily Positive Habits could range from 0-4. Relationship Satisfaction scores could range from 0 to 81.
** $p \leq .05$; **$p \leq .001$*

Table 2
Replication: Multilevel Models Results

	Daily Negative Mood		
	Effect	SE	*p*
Mothers			
Intercept	0.73**	0.059	0.00
Covariates			
Weekend	-0.01	0.021	0.49
Day in study	-0.01*	0.002	0.00
Phase	0.21**	0.061	0.00
Child age	-0.01*	0.000	0.04
Yesterday's negative mood	-0.06**	0.017	0.00
Daily hassles	0.11**	0.008	0.00
Within-Person Reciprocity			
Receive	0.07*	0.032	0.04
Give	0.01	0.040	0.85
Receive x give	-0.22**	0.049	0.00
Fathers			
Intercept	0.62**	0.066	0.00
Covariates			
Weekend	-0.01	0.023	0.79
Day in study	-0.01	0.002	0.42
Phase	0.03	0.063	0.59
Child age	0.00	0.000	0.99
Yesterday's negative mood	-0.11**	0.019	0.00
Daily hassles	0.10**	0.009	0.00
Within-Person Reciprocity			
Receive	0.07	0.043	0.08
Give	-0.07	0.035	0.06
Receive x give	-0.17**	0.053	0.00

Note: df varied based on Satterwaithe prediction. *df* ranged from 68.4 to 2745.
* $p < .05$, ** $p < .001$.

Table 3

Effects of Support Transactions on Negative Mood including Grand Mean Variables: Multilevel Models Results

	Daily Negative Mood		
	Effect	SE	*p*
Mothers			
Intercept	0.76**	0.065	0.00
Covariates			
Weekend	-0.02	0.021	0.41
Day in study	-0.01**	0.002	0.00
Phase	0.17*	0.060	0.01
Child age	0.00	0.000	0.16
Yesterday's negative mood	-0.06**	0.017	0.00
Daily hassles	0.12**	0.008	0.00
Between-Person (BP) hassles	0.23**	0.061	0.00
Within-Person Reciprocity			
Receive	0.06	0.032	0.06
Give	-0.01	0.040	0.81
Receive x give	-0.19**	0.050	0.00
Between-Person Reciprocity			
BP of support receipt	-0.15	0.278	0.58
BP of giving support	0.13	0.254	0.62
BP give x BP receive	-0.08	0.486	0.87
Fathers			
Intercept	0.72**	0.070	0.00
Covariates			
Weekend	-0.01	0.023	0.79
Day in study	0.00	0.002	0.48
Phase	0.03	0.062	0.63
Child age	0.00	0.000	0.90
Yesterday's negative mood	-0.10**	0.018	0.00
Daily hassles	0.11**	0.009	0.00
BP of hassles	0.21**	0.042	0.00
Within-Person Reciprocity			
Receive	0.07	0.042	0.09
Give	-0.07*	0.034	0.05
Receive x Give	-0.17**	0.053	0.00
Between-Person Reciprocity			
BP of support receipt	0.57*	0.243	0.02
BP of giving support	-0.58*	0.259	0.03
BP give x BP receive	-1.28*	0.480	0.01

Note: df varied based on Satterwaithe prediction. *df* ranged from 68.4 to 2745.

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

Table 4a

Support Transactions on Negative Mood with Phase Interactions for Mothers: Multilevel Models Results

	Daily Negative Mood		
	Effect	SE	*p*
Intercept	0.62**	0.072	0.00
Covariates			
Weekend	0.00	0.023	0.85
Day in study	-0.01**	0.002	0.00
Phase	-0.13	0.100	0.18
Child's age	0.00*	0.001	0.01
Yesterday's negative mood	0.00	0.017	0.95
Daily hassles	0.11**	0.009	0.00
BP hassles	0.23**	0.062	0.00
Within-Person Reciprocity			
Receiving support	0.09*	0.034	0.01
Giving support	0.01	0.041	0.83
Receive x give	-0.22**	0.051	0.00
Phase Effects			
Phase x weekend	0.07*	0.026	0.00
Phase x day in study	0.00	0.0020	0.15
Phase x child's age	0.00*	0.0003	0.00
Phase x yesterday's negative mood	0.05*	0.022	0.02
Phase x daily hassles	-0.05**	0.011	0.00
Phase x receiving support	0.08*	0.039	0.03
Phase x giving support	0.07	0.049	0.17
Phase x receive x give	-0.10	0.060	0.08
Between-Person Reciprocity			
BP receive	-0.17	0.282	0.55
BP give	0.16	0.258	0.55
BP receive x BP give	-0.06	0.494	0.90

Note: df varied based on Satterwaithe prediction. *df* ranged from 76 to 2724.
** p < .05, **p < .001.*

Table 4b
Support Transactions on Negative Mood with Phase Interactions for Fathers: Multilevel Models Results

	Daily Negative Mood		
	Effect	SE	*p*
Intercept	0.68**	0.074	0.00
Covariates			
Weekend	0.02	0.024	0.44
Day in study	0.00	0.0019	0.67
Phase	-0.07	0.104	0.49
Child's age	0.00	0.001	0.47
Yesterday's negative mood	-0.02	0.019	0.37
Daily hassles	0.09**	0.009	0.00
BP hassles	0.21**	0.042	0.00
Within-Person Reciprocity			
Receiving support	0.06	0.043	0.16
Giving support	-0.07	0.036	0.05
Receive x give	-0.17*	0.054	0.00
Phase Effects			
Phase x weekend	0.08*	0.029	0.00
Phase x day in study	0.00	0.002	0.22
Phase x child's age	0.00	0.000	0.46
Phase x yesterday's negative mood	0.06*	0.024	0.02
Phase x daily hassles	-0.07**	0.011	0.00
Phase x receiving support	-0.04	0.051	0.44
Phase x giving support	0.01	0.042	0.80
Phase x receive x give	0.01	0.063	0.92
Between-Person Reciprocity			
BP receive	0.54*	0.242	0.03
BP give	-0.54*	0.257	0.04
BP receive x BP give	-1.29*	0.477	0.01

Note: df varied based on Satterwaithe prediction. *df* ranged from 68.7 to 2473.
* $p < .05$, ** $p < .001$.

Table 5a

Within and Between-Person Effects of Locus of Control on Support Transactions: Multilevel Models Results for Mothers

	Daily Negative Mood		
	Effect	SE	*p*
Intercept	0.66**	0.066	0.00
Covariates			
Weekend	-0.01	0.019	0.48
Day in study	0.00**	0.002	0.00
Phase	0.13*	0.054	0.02
Daily locus of control (LOC)	-0.34**	0.026	0.00
Child's age	0.00	0.000	0.15
Yesterday's negative mood	-0.03*	0.016	0.04
Daily hassles	0.07**	0.008	0.00
BP of daily hassles	0.15*	0.062	0.02
BP LOC	-0.30*	0.118	0.01
Within-Person Reciprocity			
Receiving support	-0.02	0.032	0.48
Giving support	0.02	0.039	0.67
Receive x give	-0.12*	0.049	0.01
Within-Person Moderation of Within-Person Reciprocity			
LOC x receive	-0.03	0.042	0.44
LOC x give	-0.11*	0.056	0.04
LOC x receive x give	0.19**	0.068	0.00
Between-Person Moderation of Within-Person Reciprocity			
Receive x BP LOC	-0.04	0.062	0.49
Give x BP LOC	-0.22*	0.079	0.00
Receive x give X BP LOC	0.25*	0.094	0.01
Between-Person Reciprocity			
BP of receiving	0.15	0.295	0.60
BP of giving	-0.04	0.272	0.87
BP receiving x BP giving	0.52	0.600	0.39
Between-Person Moderation of Between-Person Reciprocity			
BP LOC x BP receiving	0.91	0.559	0.11
BP LOC x BP giving	-1.09*	0.536	0.05
BP LOC x BP receive x BP give	0.64	0.972	0.51

Note: df varied based on Satterwaithe prediction. *df* ranged from 67 to 2730.
* $p < .05$, ** $p < .001$.

Table 5b
Within and Between-Person Effects of Locus of Control on Support Transactions: Multilevel Models Results for Fathers

	Daily Negative Mood		
	Effect	SE	*P*
Intercept	0.61**	0.067	0.00
Covariates			
Weekend	0.01	0.022	0.81
Day in study	0.00	0.002	0.38
Phase	-0.06	0.058	0.29
Daily Locus of Control (LOC)	-0.28**	0.030	0.00
Child's age	0.00	0.000	0.40
Yesterday's negative mood	-0.09**	0.018	0.00
Daily hassles	0.08**	0.008	0.00
BP of daily hassles	0.16**	0.043	0.00
BP LOC	-0.50**	0.099	0.00
Within-Person Reciprocity			
Receiving support	0.01	0.042	0.90
Giving support	-0.04	0.033	0.26
Receive x give	-0.08	0.052	0.12
Within-Person Moderation of Within-Person Reciprocity			
LOC x receive	-0.12*	0.058	0.04
LOC x give	0.01	0.052	0.89
LOC x receive x give	0.16*	0.074	0.03
Between-Person Moderation of Within-Person Reciprocity			
Receive x BP LOC	-0.09	0.075	0.23
Give x BP LOC	0.02	0.067	0.80
Receive x give x BP LOC	0.39**	0.099	0.00
Between-Person Moderation of Within-Person Reciprocity			
BP of receiving	0.19	0.248	0.44
BP of giving	-0.25	0.257	0.34
BP receiving x BP giving	-1.05*	0.477	0.03
Between Person Moderation of Between Person			
BP LOC x BP receiving	-0.24	0.372	0.53
BP LOC x BP giving	0.20	0.374	0.60
BP LOC x BP receive x BP give	0.56	0.861	0.52

Note: df varied based on Satterwaithe prediction. *df* ranged from 67 to 2730.
* $p < .05$, ** $p < .001$.

Table 6a

Between-Person Effects of Levenson's Locus of Control on Support Transactions: Multilevel Models Results for Mothers

	Daily Negative Mood		
	Effect	SE	*p*
Intercept	0.72**	0.065	0.00
Covariates			
Weekend	-0.01	0.020	0.51
Day in study	-0.01**	0.002	0.00
Phase	0.12*	0.056	0.04
Daily locus of control (LOC)	-0.34**	0.027	0.00
Child's age	0.00	0.000	0.25
Yesterday's negative mood	-0.03	0.017	0.12
Daily hassles	0.07**	0.008	0.00
BP of daily hassles	0.24**	0.064	0.00
Levenson's LOC	-0.01	0.006	0.29
Within-Person Reciprocity			
Receiving support	-0.02	0.032	0.44
Giving support	0.05	0.038	0.17
Receive x give	-0.16**	0.048	0.00
Within-Person Moderation of Within-Person Reciprocity			
LOC x receive	-0.03	0.043	0.54
LOC x give	-0.05	0.057	0.37
LOC x receive x give	-0.01	0.068	0.07
Between-Person Moderation of Within-Person Reciprocity			
Receive x Levenson's LOC	0.00	0.005	0.57
Give x Levenson's LOC	0.01	0.007	0.12
Receive x give X Levenson's LOC	-0.01	0.009	0.25
Between-Person Reciprocity			
BP of receiving	-0.14	0.288	0.62
BP of giving	0.09	0.263	0.74
BP receiving x BP giving	-0.20	0.508	0.69
Between-Person Moderation of Between-Person Reciprocity			
Levenson's LOC x BP receiving	0.03	0.024	0.28
Levenson's LOC x BP giving	-0.03	0.022	0.19
Levenson's LOC x BP receive x BP give	0.04	0.041	0.38

Note: df varied based on Satterwaithe prediction. *df* ranged from 65.6 to 2545.
* $p < .05$, ** $p < .001$.

Table 6b

Between-Person Effects of Levenson's Locus of Control on Support Transactions: Multilevel Models Results for Fathers

	Daily Negative Mood		
	Effect	SE	*p*
Intercept	0.64**	0.078	0.00
Covariates			
Weekend	-0.01	0.022	0.75
Day in study	0.00	0.002	0.28
Phase	-0.08	0.061	0.18
Daily locus of control (LOC)	-0.29**	0.031	0.00
Child's age	0.00	0.000	0.06
Yesterday's negative mood	-0.10**	0.018	0.00
Daily hassles	0.09**	0.009	0.00
BP of daily hassles	0.20**	0.050	0.00
Levenson's LOC	-0.01	0.007	0.33
Within-Person Reciprocity			
Receiving support	0.02	0.043	0.68
Giving support	-0.03	0.035	0.40
Receive x give	-0.15*	0.053	0.01
Within-Person Moderation of Within-Person Reciprocity			
LOC x receive	-0.14*	0.060	0.02
LOC x give	-0.01	0.053	0.85
LOC x receive x give	0.19*	0.077	0.02
Between-Person Moderation of Within-Person Reciprocity			
Receive x Levenson's LOC	0.00	0.008	0.86
Give x Levenson's LOC	-0.01	0.006	0.24
Receive x give X Levenson's LOC	0.02	0.010	0.07
Between-Person Reciprocity			
BP of receiving	0.49	0.290	0.10
BP of giving	-0.51	0.312	0.10
BP receiving x BP giving	-1.25*	0.563	0.03
Between-Person Moderation of Between-Person Reciprocity			
Levenson's LOC x BP receiving	0.08*	0.030	0.01
Levenson's LOC x BP giving	-0.09**	0.030	0.00
Levenson's LOC x BP receive x BP give	-0.05	0.049	0.35

Note: df varied based on Satterwaithe prediction. *df* ranged from 65.6 to 2545.
* $p < .05$, ** $p < .001$.

Table 7a

Moderation of Support Transactions on Negative Health with Phase Interactions for Mothers:

Multilevel Models Results

	Daily Negative Health		
	Effect	SE	*p*
Intercept	1.28**	0.117	0.00
Covariates			
Weekend	-0.04	0.030	0.18
Day in study	0.00	0.003	0.65
Phase	-0.64**	0.104	0.00
Daily locus of control	-0.29**	0.040	0.00
Child's age	0.00**	0.000	0.00
Yesterday's negative health	-0.05*	0.018	0.00
Hassles	0.00	0.013	0.71
BP hassles	0.38**	0.107	0.00
BP locus of control	0.09	0.211	0.67
BP hassles x BP control	-0.43*	0.208	0.04
Within-Person Reciprocity			
Receiving support	0.05	0.051	0.32
Giving support	-0.08	0.058	0.15
Receive x give	0.02	0.074	0.80
Within-Person Moderation of Within-Person Reciprocity			
Daily control x receive	-0.11	0.069	0.11
Daily control x give	0.02	0.084	0.84
Daily control x receive x give	-0.06	0.105	0.57
Phase Effects			
Phase x receive	-0.08	0.058	0.15
Phase x give	-0.09	0.070	0.21
Phase x receive x give	0.13	0.087	0.13
Phase x daily locus of control x receive	-0.05	0.062	0.42
Phase x daily locus of control x give	0.08	0.092	0.40
Phase x daily locus of control x receive x give	0.04	0.115	0.74
Between-Person Reciprocity			
BP receive	0.33	0.507	0.52
BP give	0.12	0.469	0.80
BP receive x BP give	-1.37	1.037	0.19
Between-Person Moderation of Between-Person Reciprocity			
BP receive x BP control	-1.24	1.051	0.24
BP give x BP control	0.36	0.956	0.71
BP receive x BP give x BP control	-4.57*	1.902	0.02

Note: df varied based on Satterwaithe prediction. *df* ranged from 72.7 to 2775. * $p < .05$, ** $p < .001$.

Table 7b

Moderation of Support Transactions on Negative Health with Phase Interactions for Fathers:

Multilevel Models Results

	Daily Negative Health		
	Effect	SE	*p*
Intercept	1.04**	0.104	0.00
Covariates			
Weekend	0.04	0.031	0.17
Day in study	-0.01*	0.003	0.02
Phase	-0.07	0.101	0.47
Daily locus of control	-0.23**	0.043	0.00
Child's age	0.00	0.000	0.23
Yesterday's negative health	-0.04*	0.019	0.02
Hassles	0.00	0.012	0.98
BP hassles	0.33**	0.063	0.00
BP locus of control	-0.02	0.138	0.90
BP hassles x BP control	0.25*	0.117	0.04
Within-Person Reciprocity			
Receiving support	0.29**	0.058	0.00
Giving support	0.02	0.048	0.68
Receive x give	-0.27**	0.072	0.00
Within-Person Moderation of Within-Person Reciprocity			
Daily locus of control x receive	-0.21*	0.081	0.01
Daily locus of control x give	-0.01	0.073	0.88
Daily locus of control x receive x give	0.06	0.104	0.58
Phase Effects			
Phase x receive	0.19*	0.069	0.00
Phase x give	0.01	0.058	0.85
Phase x receive x give	-0.17	0.086	0.05
Phase x Daily locus of control x receive	0.07	0.080	0.36
Phase x Daily locus of control x give	0.10	0.076	0.19
Phase x Daily locus of control x receive x give	-0.22	0.115	0.06
Between-Person Reciprocity			
BP receive	0.03	0.364	0.94
BP give	-0.27	0.375	0.47
BP receive x BP give	-0.21	0.693	0.77
Between-Person Moderation of Between-Person Reciprocity			
BP receive x BP control	0.14	0.566	0.80
BP give x BP control	0.32	0.554	0.57
BP receive x BP give x BP control	-0.60	1.250	0.63

Note: df varied based on Satterwaithe prediction. *df* ranged from 72.7 to 2775.* $p < .05$, **$p < .001$.

Table 8a

Between-Person Moderation of Support Transactions on Negative Health with Phase Interactions for Mothers: Multilevel Models Results

	Daily Negative Health		
	Effect	SE	*p*
Intercept	1.24**	0.106	0.00
Covariates			
Weekend	-0.04	0.030	0.18
Day in study	-0.00	0.003	0.59
Phase	-0.65**	0.100	0.00
Daily locus of control	-0.30**	0.041	0.00
Child's age	0.00**	0.000	0.00
Yesterday's negative health	0.01	0.026	0.64
Hassles	0.01	0.013	0.47
BP hassles	0.40**	0.101	0.00
Levenson's locus of control	-0.01	0.010	0.16
Within-Person Reciprocity			
Receiving support	0.04	0.054	0.49
Giving support	-0.05	0.060	0.44
Receive x give	-0.00	0.077	0.98
Within-Person Moderation of Within-Person Reciprocity			
Daily locus of control x receive	-0.10	0.071	0.16
Daily locus of control x give	0.02	0.087	0.86
Daily locus of control x receive x give	-0.05	0.108	0.65
Phase Effects			
Phase x receive	-0.10	0.064	0.12
Phase x give	-0.06	0.074	0.43
Phase x receive x give	0.14	0.092	0.12
Phase x Daily locus of control x receive	-0.04	0.063	0.53
Phase x Daily locus of control x give	-0.00	0.097	0.99
Phase x Daily locus of control x receive x give	0.12	0.120	0.31
Between-Person Reciprocity			
BP receive	0.53	0.459	0.25
BP give	-0.46	0.420	0.27
BP receive x BP give	-1.13	0.809	0.17
Between-Person Moderation of Between-Person Reciprocity			
BP receive x Levenson's control	-0.12**	0.041	0.00
BP give x Levenson's control	0.04	0.038	0.24
BP receive x BP give x Levenson's control	0.02	0.070	0.75

Note: df varied based on Satterwaithe prediction. *df* ranged from 63.7 to 2510.* $p < .05$, ** $p < .001$.

Table 8b

Between-Person Moderation of Support Transactions on Negative Health with Phase Interactions for Fathers: Multilevel Models Results

	Daily Negative Health		
	Effect	SE	*p*
Intercept	0.99**	0.108	0.00
Covariates			
Weekend	0.02	0.031	0.48
Day in study	-0.01*	0.003	0.04
Phase	-0.12	0.099	0.24
Daily locus of control	-0.24**	0.044	0.00
Child's age	0.00	0.000	0.06
Yesterday's negative health	0.09**	0.026	0.00
Hassles	0.00	0.012	0.84
BP hassles	0.02	0.031	0.48
Levenson's locus of control	-0.01*	0.003	0.04
Within-Person Reciprocity			
Receiving support	0.28**	0.062	0.00
Giving support	0.01	0.052	0.78
Receive x give	-0.27**	0.078	0.00
Within-Person Moderation of Within-Person Reciprocity			
Daily locus of control x receive	-0.22*	0.084	0.01
Daily locus of control x give	-0.03	0.077	0.68
Daily locus of control x receive x give	0.09	0.109	0.41
Phase Effects			
Phase x receive	0.18*	0.073	0.02
Phase x give	0.01	0.063	0.82
Phase x receive x give	-0.16	0.093	0.09
Phase x Daily locus of control x receive	0.10	0.082	0.23
Phase x Daily locus of control x give	0.08	0.082	0.30
Phase x Daily locus of control x receive x give	-0.24*	0.121	0.05
Between-Person Reciprocity			
BP receive	0.26	0.375	0.49
BP give	-0.54	0.403	0.18
BP receive x BP give	-0.33	0.723	0.65
Between-Person Moderation of Between-Person Reciprocity			
BP receive x Levenson's control	0.04	0.045	0.38
BP give x Levenson's control	-0.08	0.047	0.09
BP receive x BP give x Levenson's control	-0.13	0.075	0.07

Note: df varied based on Satterwaithe prediction. *df* ranged from 63.7 to 2510.* $p < .05$, ** $p < .001$.

Table 9a

Moderation of Support Transactions on Positive Health Habits with Phase Interactions for Mothers: Multilevel Models Results

	Daily Negative Health		
	Effect	SE	*p*
Intercept	1.63**	0.115	0.00
Covariates			
Weekend	-0.09*	0.036	0.01
Day in study	-0.01*	0.003	0.00
Phase	-0.74**	0.103	0.00
Daily locus of control	0.34**	0.049	0.00
Child's age	0.00**	0.000	0.00
Yesterday's negative health	-0.03	0.019	0.16
Hassles	0.02	0.015	0.11
BP hassles	0.15	0.102	0.13
BP locus of control	0.39	0.198	0.05
BP hassles x BP control	0.29	0.196	0.14
Within-Person Reciprocity			
Receiving support	-0.07	0.062	0.28
Giving support	-0.06	0.071	0.43
Receive x give	0.10	0.091	0.29
Within-Person Moderation of Within-Person Reciprocity			
Daily locus of control x receive	-0.09	0.085	0.31
Daily locus of control x give	-0.04	0.104	0.70
Daily locus of control x receive x give	0.12	0.130	0.34
Phase Effects			
Phase x receive	0.07	0.071	0.34
Phase x give	-0.03	0.086	0.75
Phase x receive x give	0.03	0.107	0.75
Phase x Daily locus of control x receive	-0.06	0.076	0.42
Phase x Daily locus of control x give	-0.19	0.117	0.10
Phase x Daily locus of control x receive x give	0.32*	0.145	0.03
Between-Person Reciprocity			
BP receive	0.36	0.478	0.45
BP give	0.16	0.442	0.72
BP receive x BP give	-0.18	0.978	0.86
Between-Person Moderation of Between-Person Reciprocity			
BP receive x BP control	-0.23	0.998	0.82
BP give x BP control	0.30	0.906	0.74
BP receive x BP give x BP control	0.47	1.777	0.79

Note: df varied based on Satterwaithe prediction. *df* ranged from 72.7 to 2775.

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

Table 9b

Moderation of Support Transactions on Positive Health Habits with Phase Interactions for Fathers: Multilevel Models Results

	Daily Negative Health		
	Effect	SE	*p*
Intercept	1.66**	0.123	0.00
Covariates			
Weekend	-0.12*	0.039	0.00
Day in study	0.00	0.003	1.00
Phase	-0.13	0.105	0.21
Daily locus of control	0.31**	0.054	0.00
Child's age	0.00	0.000	0.34
Yesterday's negative health	-0.05*	0.019	0.01
Hassles	0.02	0.015	0.23
BP hassles	0.15	0.079	0.05
BP locus of control	0.67**	0.171	0.00
BP hassles x BP control	0.16	0.144	0.28
Within-Person Reciprocity			
Receiving support	-0.04	0.074	0.55
Giving support	0.08	0.061	0.19
Receive X give	-0.10	0.092	0.29
Within-Person Moderation of Within-Person Reciprocity			
Daily locus of control x receive	-0.17	0.104	0.09
Daily locus of control x give	0.12	0.094	0.20
Daily locus of control x receive x give	0.13	0.134	0.35
Phase Effects			
Phase x receive	0.00	0.087	0.99
Phase x give	-0.03	0.072	0.72
Phase x receive x give	-0.10	0.109	0.37
Phase x Daily locus of control x receive	0.03	0.104	0.75
Phase x Daily locus of control x give	0.12	0.098	0.21
Phase x Daily locus of control x receive x give	-0.20	0.149	0.19
Between-Person Reciprocity			
BP receive	-0.13	0.451	0.77
BP give	0.11	0.466	0.82
BP receive x BP give	-0.35	0.874	0.69
Between-Person Moderation of Between-Person Reciprocity			
BP receive x BP control	-0.13	0.706	0.86
BP give x BP control	0.12	0.690	0.86
BP receive x BP give x BP control	-0.83	1.559	0.60

Note: df varied based on Satterwaithe prediction. *df* ranged from 72.7 to 2775.

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

Figure 1. Replication of Effects of Supportive Reciprocity on Mood for Mothers and Fathers

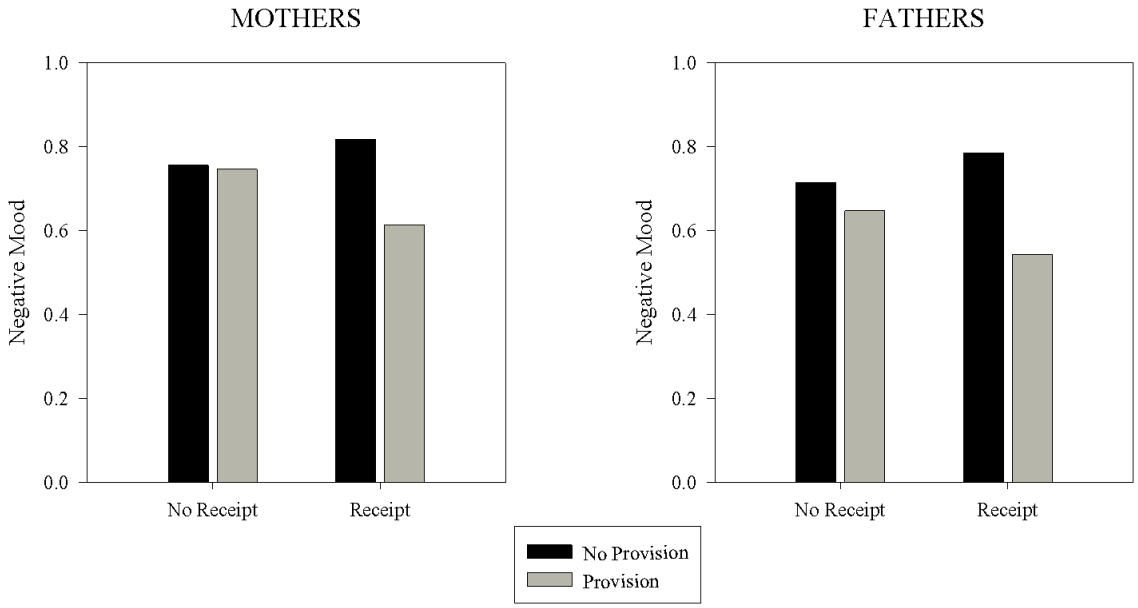


Figure 2. Effects of Supportive Reciprocity on Negative Mood across Phases for Mothers and Fathers

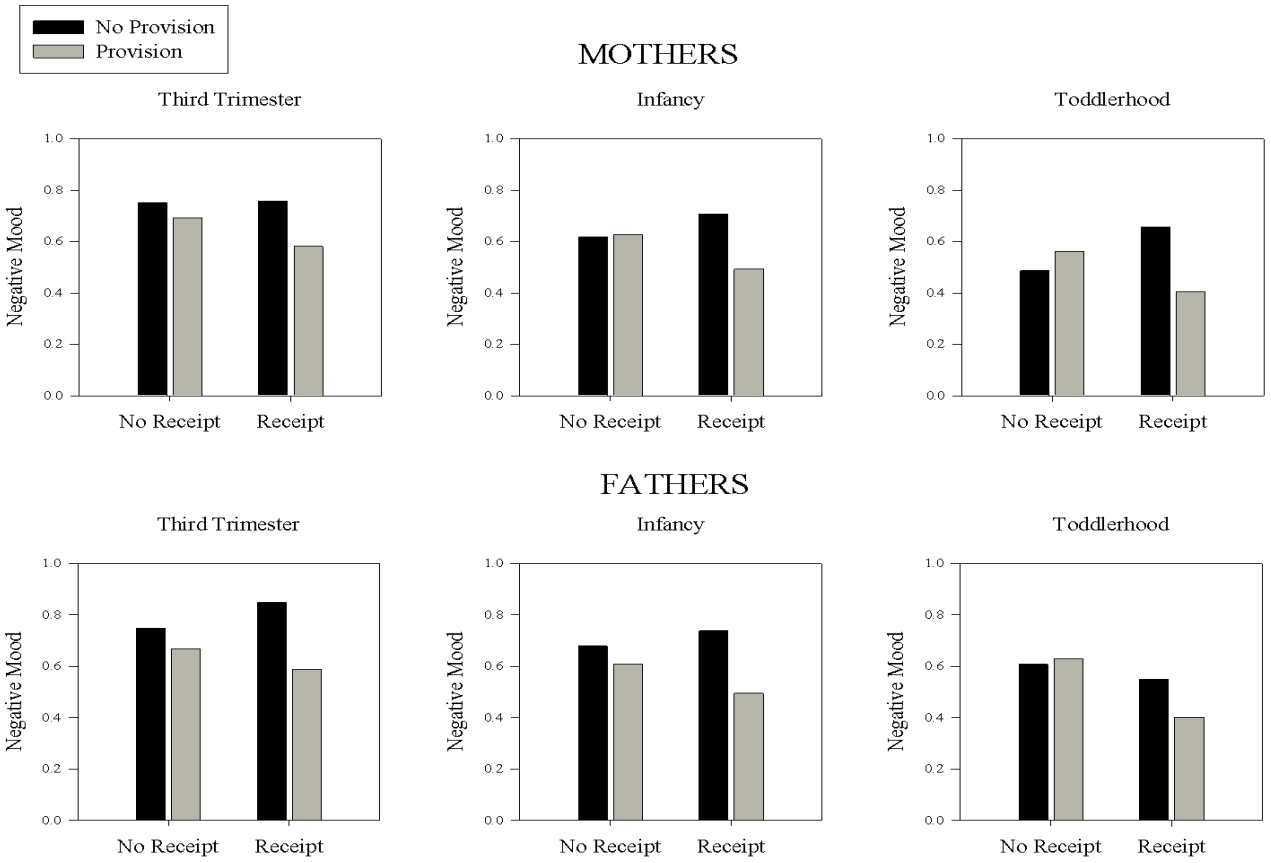


Figure 3. Effects of Within-Person Moderation of Within-Person Supportive Reciprocity for Mothers and Fathers

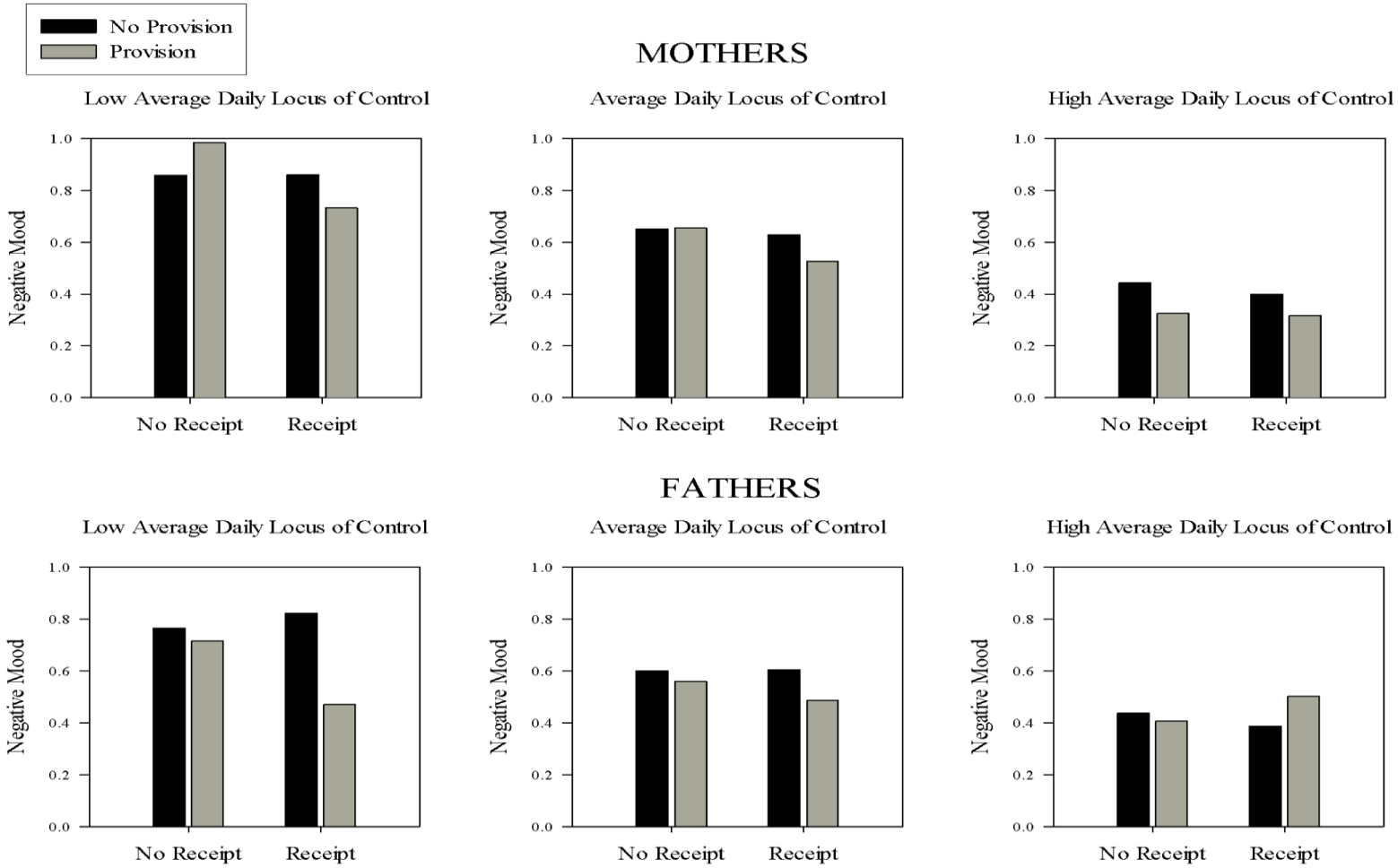


Figure 4. Effects of Supportive Reciprocity on Negative Health Symptoms for Mothers and Fathers

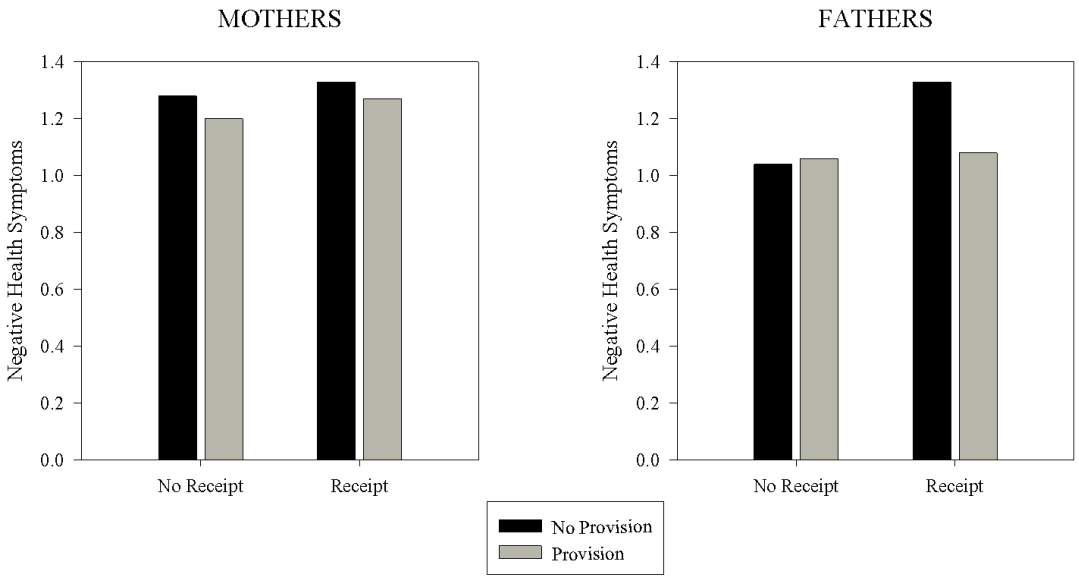
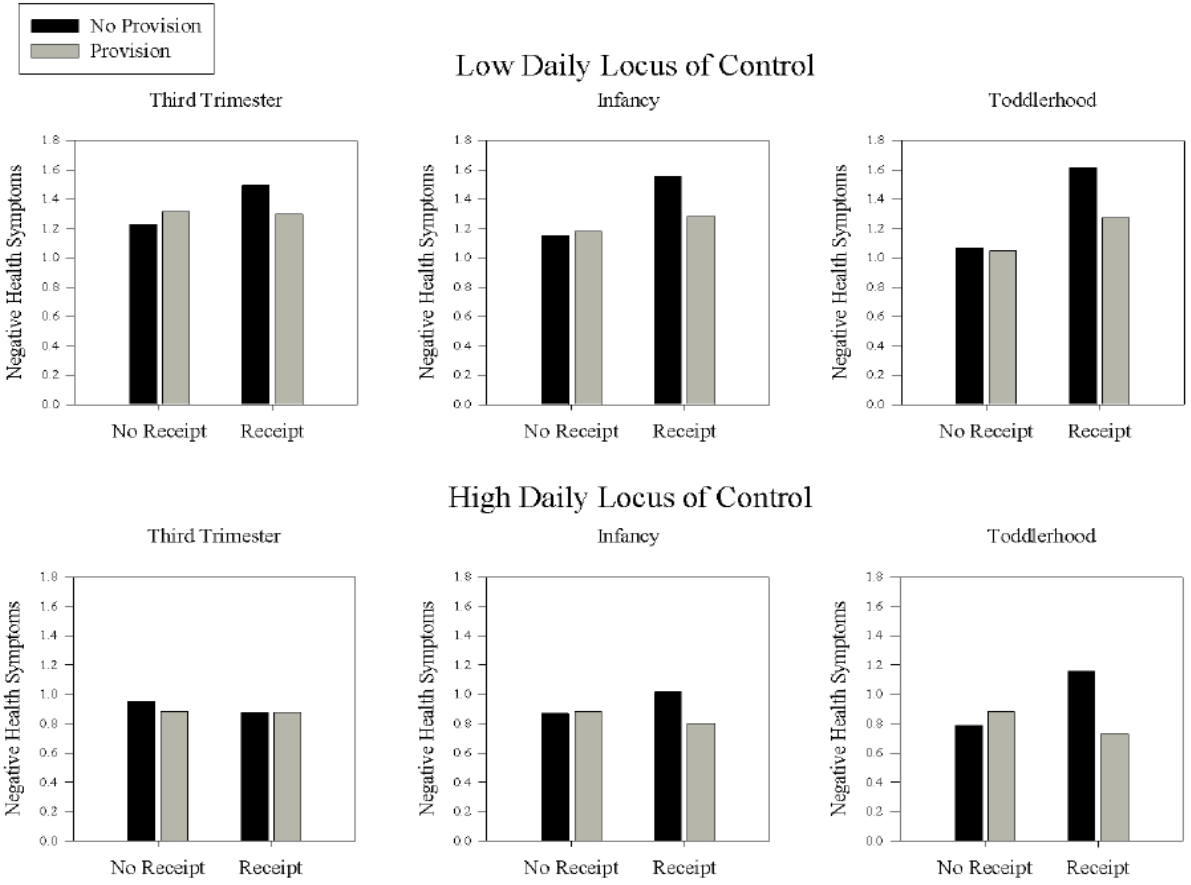


Figure 5. Effects of Within-Person Supportive Reciprocity on Negative Health Symptoms across Phases for Fathers on Low and High Control Days



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