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Partner Support and Maternal Depression in the Context of the Iowa Floods

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Abstract

A systematic investigation of the role of prenatal partner support in perinatal maternal depression was conducted. Separate facets of partner support were examined (i.e., received support and support adequacy) and a multidimensional model of support was applied to investigate the effects of distinct types of support (i.e., informational, physical comfort, emotional/esteem, and tangible support). Both main and stress-buffering models of partner support were tested in the context of prenatal maternal stress resulting from exposure to a natural disaster. Questionnaire data were analyzed from N=145 partnered women using growth curve analytic techniques. Results indicate that received support interacts with maternal flood stress during pregnancy to weaken the association between stress and trajectories of maternal depression from pregnancy to 30 months postpartum. Support adequacy did not interact with stress, but was associated with levels of depressive symptoms controlling for maternal stress and received support. Results demonstrate the distinct roles of various facets and types of support for a more refined explanatory model of prenatal partner support and perinatal maternal depression. Results inform both main effect and

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stress buffering models of partner support as they apply to the etiology of perinatal maternal depression, and highlight the importance of promoting partner support during pregnancy that matches support preferences.

Keywords

prenatal partner support; perinatal maternal depression; prenatal maternal stress; couples; natural disaster

Results of meta-analytic investigations suggest that prevalence rates of perinatal depression (i.e., depression during pregnancy and throughout the postpartum period) range from 7–19% (Gavin et al., 2005; O'Hara & McCabe, 2013), making it a serious mental health concern. Maternal depression has profound and lasting effects on child development, with research demonstrating robust links with poor child behavioral outcomes including internalizing and externalizing behaviors (e.g., Fisher, Brock, O'Hara, Kopelman & Stuart, 2014; Goodman et al., 2011), impaired cognitive development (e.g., Grace, Evindar, & Stewart, 2003), and physical health (e.g., Gump et al., 2009). Social support received from one's friends, family members, and intimate partners has moderate to large associations with (lower levels of) postpartum depression (Beck, 2001; O'Hara & Swain, 1996; Robertson, Grace, Wallington, & Stewart, 2004). Support received *from one's intimate partner* is a particularly vital resource in times of stress and adversity. Indeed, partner support has a greater impact on physical and mental health relative to support received outside of the intimate relationship (Gardner & Cutrona, 2004). Given the importance of support received from one's intimate partner, it is not surprising that there is a link between prenatal partner support and postpartum maternal depression (e.g., Milgrom et al., 2008; Neter, Collins, Lobel, & Dunkel-Schetter, 1995; Stapleton et al., 2012).

Research demonstrating a link between prenatal partner support and maternal depression is informative and directs researchers and clinicians toward an important focus of research and practice; however, these findings must be expanded upon to inform both theoretical models and clinical interventions for preventing and treating maternal depression. Foremost, there is a need for systematic investigations of the multifaceted and multidimensional nature of partner support to clarify under what conditions partner support is more or less adaptive for perinatal women. Individual differences in support needs and preferences must be considered, and the unique implications of different types of support (e.g., instrumental versus emotion-focused support) must be examined. Further, the long-term impact of partner support on maternal depression must be ascertained. The primary purpose of the present study was to apply a multifaceted and multidimensional model of partner support to obtain a more refined framework explaining the role of partner support in maternal depression during the perinatal period and beyond.

A Multifaceted and Multidimensional Model of Partner Support

Social support is a higher-order construct comprised of multiple lower-order facets or components (Brock & Lawrence, 2010a; Pierce, Sarason, Sarason, Joseph, & Henderson, 1996), yet researchers rarely differentiate between these components or examine their

relative effects on maternal depression. For example, there is an important distinction between global perceptions of support availability and specific support transactions. Support transactions consist of complex behavioral exchanges occurring between a support provider and recipient in the context of a personal problem or stressor. From a clinical perspective, support transactions are particularly relevant because they consist of behaviorally identifiable components to directly target in interventions aimed at promoting more adaptive partner support processes.

Support transactions are also multifaceted, and different components of a transaction (i.e., support solicitation, support provision, received support, support adequacy) provide unique information about how a transaction unfolds between two partners. Received support and support adequacy are two facets that have particular relevance for determining the extent to which a transaction has been adaptive (Brock & Lawrence, 2010b). *Received support* refers to the extent to which a recipient perceives or recognizes support. Partners may enact support behaviors, but the intended recipient may not notice or "receive" the behaviors (Pierce et al., 1996). After support is received (or not), recipients also evaluate the utility of support for adapting to stressors and strains. *Support adequacy* refers to the extent to which support that is received is perceived as useful for adapting to stressful or challenging events. Support transactions often include support solicitation and the actual enactment of support; however, reports of received support and support adequacy gauge the extent to which solicitation and provision behaviors (or the lack of these behaviors) ultimately result in adaptive outcomes for the recipient.

In the past decade, researchers have increasingly emphasized the importance of considering the *adequacy of support* that is received during support transactions (e.g., Sullivan & Davila, 2010). Individuals have unique support needs, and support that is adaptive for some may be insufficient and even maladaptive for others. Consequently, it is important to consider the match between support that is received and individual support preferences. Researchers examining the impact of prenatal partner support on perinatal depression have accounted for support adequacy; however, support adequacy is often aggregated with other facets of support such as received support (e.g., Stapleton et al., 2012). Consequently, the potentially unique and salient role of partner support *adequacy* has been overlooked.

In order to gain further specificity with regard to the role of prenatal partner support in perinatal maternal depression, the *multidimensional* nature of support must be considered. Supportive exchanges can consist of different types of behaviors ranging from more action-facilitating support behaviors that involve actively trying to solve a problem to more emotional and nurturing support behaviors that are intended to be comforting to someone in distress (Cutrona & Suhr, 1992; Thoits, 1982). Although multidimensional models of social support have been applied, the potential for a unique multidimensional structure in the context of intimate relationships (compared to friendships or relationships with relatives) has generally been overlooked. Indeed, results of a recent factor analysis (Barry, Bunde, Brock, & Lawrence, 2009) identify four distinct types of support provided in intimate relationships: (a) informational support (e.g., giving suggestions about how to handle a situation, sharing a similar personal experience, offering advice), (b) physical comfort (e.g., holding hands, kissing, cuddling), (c) esteem/emotional support (e.g., listening, expressing confidence in

one's abilities, validating feelings), and (d) tangible support (e.g., directly or indirectly doing something to address the issue). In the context of intimate relationships, *physical comfort* is a unique dimension, and has demonstrated incremental utility beyond other support types (Barry et al., 2009). Consideration of these distinct types of support is an important step in clarifying the role of both received partner support and partner support adequacy in perinatal maternal depression.

The Role of Partner Support in the Context of a Prenatal Maternal Stress

A multifaceted and multidimensional model of partner support might clarify the conditions under which support is adaptive for women during pregnancy; however, another important step in this line of research is to consider the role of partner support in the context of prenatal maternal stress. Indeed, prenatal maternal stress is one of the most robust psychosocial predictors of maternal depression (Beck, 2001; O'Hara & Swain, 1996). Establishing the predictive utility of partner support beyond that of prenatal maternal stress is essential. Further, research is needed to examine interactions between prenatal partner support and maternal stress given that the primary role of social support is often conceptualized as a buffer of the deleterious consequences of stress (e.g., stress-buffering hypothesis of social support; Cohen & Wills, 1985). Further, within a marital discord model of depression (Beach, Sandeen, & O'Leary, 1990), intimate partner support serves a protective function, helping couples adapt to challenges that might put individual partners at risk for depression. Yet, research aimed at examining partner support as a moderator of the link between stress and depression in general (not limited to the perinatal period) has produced inconsistent results (as reviewed by Whisman, 2013). This may be due to inconsistency with regard to the specific facets of support examined, or due to aggregating separate facets that may serve different functions in the context of stress.

Methodological advancements in the measurement of prenatal maternal stress are also necessary to clarify the relative and interactive effects of prenatal partner support and stress. There are few occasions to examine the effects of stress under relatively controlled conditions outside of laboratory sessions; however, natural disasters provide this opportunity. Because disasters of this nature occur sporadically, stress exposure is quasi-randomly assigned to women, potentially reducing confounds such as shared vulnerabilities for stress and psychopathology (e.g., temperament). The rapid and acute onset of natural disasters followed by ongoing strains from adversity caused by the disaster also create circumstances under which women are exposed to varying types and degrees of stress. Further, natural disasters are associated with a substantial (17%) increase in the risk for psychological disorders (Rubonis & Bickman, 1991); therefore, they provide a rigorous test of the protective role of support in the face of relatively extreme levels of adversity. Finally, the use of objective measures of stress is important in the context of a natural disaster to minimize shared method variance. Maternal temperament will undoubtedly influence both subjective perceptions of the natural disaster and degree of depressive symptoms reported during the perinatal period. A measure of objective hardship serves to disentangle stressful elements of the disaster from maternal temperament.

The Iowa Flood Study

In June 2008, the U.S. Midwest experienced its worst flooding in more than 50 years. Eighty-five of Iowa's 99 counties were declared disaster areas. In Cedar Rapids, approximately 5400 residential properties were damaged or destroyed, more than 3000 children were displaced from schools or daycares, and the total cost of recovery has been estimated to be as high as $10 billion. By June 15, 2008, 1800 blocks of Cedar Rapids were under water. By July 22, the Midwest storms and torrential rains had killed at least 24 people. More than 38,000 people had been driven from their homes. This flooding may rank among the top 10 disasters in U.S. history. Thus, the Iowa Floods of 2008 provided a unique opportunity to investigate factors that exacerbate and mitigate the effects of prenatal maternal stress on birth outcomes, maternal mental health, and child development. The Iowa Flood Project was instituted to capitalize on a unique situation: women exposed to the floods had already been participating in a study of psychological functioning, coping, and social support during pregnancy (Nylen, O'Hara, & Engeldinger, 2012); therefore, baseline data were available prior to the onset of the floods to control for pre-existing factors.

Additional Methodological Refinements

We propose additional methodological refinements to further elucidate the role of partner support in maternal depression. First, the long-term impact of support on depression is unclear with the majority of research examining maternal depression within the first year following childbirth (what is typically referred to as the "postpartum" period). In order to clarify the scope of the impact of prenatal support on subsequent depression, symptoms need to be assessed prospectively from pregnancy throughout several years after childbirth. This is particularly relevant given that, more often than not, women experience a pattern of recovery and recurrence of depression beyond the first year following childbirth (Nylen et al., 2010). Further, depression beyond the first year postpartum has enduring effects on child development (Fisher et al., 2014; Halligan, Murray, Martins, & Cooper, 2007), especially during *toddlerhood* when children are especially sensitive to abnormal socialization contexts (Davies & Sturge-Apple, 2007).

Second, there has been debate regarding the application of categorical versus dimensional models of psychopathology (Watson, 2005). Examining disorders at the symptom level (i.e., dimensionally) as opposed to at the diagnostic level addresses problems inherent in a categorical approach. Most notably, a dimensional approach accounts for subthreshold symptoms that are often associated with clinically significant impairment. Further, diagnostic practices involve the application of relatively arbitrary cut-offs such that slight shifts in symptoms result in a change in diagnostic status which undermines reliability (Widiger & Clark, 2000). This is particularly problematic in the context of longitudinal studies given that temporal stability can be compromised despite relatively minor fluctuations in symptom severity. By examining symptoms of depression as opposed to diagnoses, a more sensitive analysis of psychopathology can be obtained across repeated measures.

The Present Study

There were three specific aims to the present study. First, we aimed to examine the main effects of received support and support adequacy during pregnancy on trajectories of maternal depressive symptoms. We predicted that both received support and support adequacy would be associated with rates of change in maternal depressive symptoms (spanning pregnancy to 30 months postpartum) and levels of depressive symptoms at 30 months postpartum, controlling for prenatal maternal stress (i.e., flood stress and stress from sources other than the floods). Further, we predicted that, when examining received support and support adequacy simultaneously, support adequacy would demonstrate predictive dominance over received support.

Second, we aimed to test the stress-buffering roles of received support and support adequacy to determine whether one or both facets interact with prenatal flood stress to minimize risk for depressive symptoms. We had two competing hypotheses for this aim: (1) high levels of *received support* will buffer the effects of stress given this facet represents access to more coping resources, or (2) more *adequate support* will buffer the effects of stress because this facet is indicative of access to support that matches unique support preferences.

The third aim of the present study was to apply the main and/or stress-buffering models of received support and support adequacy identified in Aims 1 and 2 for each of four distinct types of partner support (information, physical comfort, emotional/esteem, and tangible support). A range of provisions may be required to match the multifaceted nature of disaster impact (e.g., Kaniasty & Norris, 1993); therefore, we did not have any specific hypotheses regarding the types of support that would be best suited for coping with hardships associated with a natural disaster.

Method

Participants and Procedures

A study of psychological functioning, coping, and social support during pregnancy was already underway at the time of the Iowa floods: the *Emotional Experiences of Women During Pregnancy* study (Nylen, O'Hara, & Engeldinger, 2012). Measures of support, depression, and stress were being administered by mail at various time points as described below (see Measures: Emotional Experiences Protocol). The *Emotional Experiences* study had been approved by the IRB of the University of Iowa in 2007 and was still recruiting throughout 2008 when the peak of the flooding occurred (June 15, 2008).

Participants in the *Emotional Experiences* study were invited to enroll in a new project designed to assess the impact of the floods – *The Iowa Flood Study* – which received approval on July 11, 2008 from the same IRB. Further, new recruitment for the *Flood Study* occurred between July 1 and November 25, 2008. The newly recruited *Flood Study* participants also completed the *Emotional Experiences* protocol (measures of support, depression, and stress) immediately after enrollment, while all re-recruited women from the *Emotional Experiences* study completed the *Flood Study* protocol (measures of flood stress).

A total of 269 participants completed procedures from both the *Emotional Experiences* and *Flood Study* protocols.

Women were eligible to participate in the *Flood Study* if they met the following criteria: (a) 18 years of age or older, (b) pregnant on (or prior to) June 10, 2008 (the onset of the floods), (c) singleton pregnancy, and (d) English speaking. Women were recruited via brochures, press releases, or in person at obstetric clinics and Women, Infants, and Children (WIC) clinics located in areas affected by the flood.

For the present study, a subsample of 145 participants was identified including women who (a) were exposed to the flood *during* pregnancy, (b) provided *prenatal* measures of support, stress, and depression, and (c) were in committed relationships and cohabiting with their partners. Of these women, 95% were married, 97% identified as White, and 78% were employed. The majority of participants were upper middle class (61.6%; Hollingshead SES status), and modal household income was >$70,001 (39.7%). On average, women were 29.3 years of age (*SD* = 4.7). The majority of women were exposed to the peak of flooding (June 15, 2008) during the second trimester of pregnancy (46.9%); approximately 29.7% were exposed during the first trimester and 23.4% during the third trimester. All women completed the *Emotional Experiences* protocol during pregnancy. Approximately 23.4% of participants completed the *Emotional Experiences* protocol prior to the peak of flooding (*M* = 2.47 months, *SD* = 1.76), whereas the remainder provided these data after (*M* = 2.31 months, *SD* = 1.02).[1]

Measures: Emotional Experiences Protocol

Perinatal Maternal Depression—The *Inventory of Depression and Anxiety Symptoms (IDAS*; Watson et al., 2007) is self-report questionnaire that measures symptoms of depression and related anxiety disorders. Participants indicate the degree to which they have felt or experienced a list of symptoms over the past two weeks using a 5-point Likert scale from 1 (*not at all*) to 5 (*extremely*). The *general depression scale* (20 items) was used in the present study and maps onto traditional measures such as the BDI-II. IDAS scores were obtained at five times: (1) pregnancy (*M* = 3.92 months prior to childbirth; *n* = 145), (2) around the time of childbirth (*M* = 1.89 months prior to childbirth; *n* = 104), (3) 16 months post-childbirth (*M* = 16.18 months; *n* = 102), (4) approximately 18 months post-childbirth (*M* = 17.72 months, with a range of 12.65 to 24.74 months postpartum; *n* = 100), and (5) 30 months post-childbirth (*M* = 30.74 months; *n* = 88). Approximately one-fourth (25.5%) had withdrawn from the study by the fifth wave of data collection (30 months post-childbirth). Varying intervals between time points across participants were accounted for in statistical analyses. Cronbach's αs ranged from .88 to .90 across time.

Partner Support—*Support in Intimate Relationships Scale-Revised (SIRRS-R;* Barry et al., 2009). The SIRRS-R is an adapted version of the SIRRS (Dehle, Larsen, & Landers, 2001) and measures global perceptions of support over extended periods of time (e.g., weeks

[1]Timing of the *Emotional Experiences* assessment (i.e., before or after the floods) did not moderate main or stress-buffering effects of partner support examined in the present study, *t*s ranged from −0.13 to 1.84, *p*s > .05. Further, the magnitude of the effects obtained for the full sample were the same in the subsample of women who only completed assessments *after* the onset of the floods (*n* = 111).

to months at a time rather than daily as in the SIRRS). The SIRRS-R is a shortened version of the original 48-item measure, consisting of 25 items that were factor analytically derived across dating and marital relationships, across men and women, and across time, and demonstrates strong reliability and validity (convergent, divergent, and incremental predictive utility). Items capture a wide range of support behaviors; focus on support from partners in intimate relationships; capture both frequency and adequacy of support; and are anchored in behaviorally specific indicators. Participants are asked to report the frequencies of specific support behaviors from partners over the past month (never, rarely, sometimes, often, almost always) and indicate a preferred frequency for each behavior (more, less, or the same). The SIRRS-R was administered at the same time as the initial IDAS assessment (pregnancy; M = 3.92 mos. prior to childbirth).

To obtain scores of *received support*, responses to estimated frequencies of support behaviors (0=never, 1=rarely, 2=sometimes, 3=often, 4=almost always) were summed. The internal consistency (Cronbach's α) was .95. Support behaviors captured by the SIRRS-R represent four types of support (informational, physical comfort, emotional/esteem, and tangible). Scores of received support were also calculated for each type of support: informational (possible range: 0–32; α = .87), physical comfort (possible range: 0–16; α = .92), emotional/esteem (possible range: 0–32; α = .92), tangible (possible range: 0–20; α = .89)

Scores of *support adequacy* were obtained by coding responses for the preferred frequency of support behaviors such that 0 = inadequate (would like more or less of that support) and 1 = adequate (would like the same amount of that support). A sum score was obtained. Cronbach's α was .92. Scores of support adequacy were also obtained for each type of support: informational (possible range: 0–8; α = .81), physical comfort (possible range: 0–4; α = .87), emotional/esteem (possible range: 0–8; α = .87), tangible (possible range: 0–5; α = .87).

Prenatal Maternal Life Stress—In order to control for prenatal stress from sources other than the flood, we used the *Prenatal Life Experiences Questionnaire* (PLEQ; Larsen, 2004). The PLEQ is a measure adapted for use in pregnant women to assess life events during pregnancy. The PLEQ was previously developed by Larsen (2004) based on several existing life events questionnaires. Items included on this measure assess a variety of life events including career changes, changes in living arrangements, financial troubles, physical and/or sexual abuse, loss of a loved one, difficulties in interpersonal relationships, and problems specific to pregnancy, among others. Using a checklist containing 50 life events (plus space for events not covered on the questionnaire), participants are asked to indicate which, if any, of the events occurred "since you became pregnant." In addition, participants are asked to rate how much of a positive or negative impact each event had on their lives. Ratings are made on a Likert-type scale with the following response options: 1 = highly negative impact, 2 = negative impact, 3 = no impact, 4 = positive impact, 5 = highly positive impact. Items endorsed as negative were tallied to reflect a negative events score (e.g. number of negative/stressful life events). There is little reason to expect that items on a checklist of events should be highly correlated with other items on the measure; therefore, internal consistency

estimates are not relevant. The PLEQ was administered at the same time as the initial IDAS assessment and the SIRRS-R (i.e., during pregnancy).

Measures: Flood Study Protocol

Prenatal Maternal Flood Stress—Based on the Storm32 questionnaire developed for Project Ice Storm (Laplante, Zelazo, Brunet, & King, 2007), the *Iowa Flood 100* (*IF100*) was developed specifically for this study to measure each woman's degree of objective hardship resulting from exposure to the Iowa floods of 2008. Items were written to collect factual information rather than subjective experience. Items assess four key dimensions of natural disasters: 13 items about threat to life or physical integrity, 9 items about loss, 4 items related to the scope of each woman's experience, and 13 items about change. See online supplemental material for the IF100 items and scoring procedures. A committee of three researchers and a statistician constructed the scoring scheme by examining the distribution of each item, attributing an initial scoring scheme to each item, and adjusting the weights of individual items. This was done over many iterations until consensus was reached about the face validity within and across subscales. Each category was finally scored such that the sum of the items could range from 0 (no impact) to a maximum of 25 points (high impact). A total stress score was calculated by summing the four categories. The scales were weighted equally, as was done by McFarlane (McFarlane, 1988) because there was no *a priori* knowledge about which category would have the greatest predictive power. The IF100 was administered within approximately 5 months of the peak of flooding (*M*=2.38 months after peak of the floods, *SD* =0.91).

Data Analysis

Less than 1% of data were missing at the item level, and we used person mean imputation to estimate missing values prior to creating composite scores. Four women failed to complete the more than half of the items assessing support adequacy on the SIRRS-R; therefore, multiple imputation ($m = 5$) was used to estimate these missing values. Analyses were conducted with growth curve analytic (GCA) techniques and HLM 7. GCA estimates within-individual change or growth trajectories for a variable (i.e., depressive symptoms) described by two parameters: *intercept* (symptom levels at a certain point in time) and *slope* (rates of change in symptoms over time). GCA provides tests of whether, on average, intercepts and slopes differ significantly from zero and whether there is variability in parameter estimates across participants. Time was centered at 30 months postpartum to model the intercept as levels of depressive symptoms during toddlerhood. HLM uses all available data from each individual to estimate within-subject parameters; thus, participants without data at every time point are retained in the analyses.

Results

See Table 1 for descriptive statistics and Table 2 for correlations. Prenatal stress was not significantly associated with prenatal received support or support adequacy. The correlation between received support and support adequacy ($r = .65$) was large in magnitude suggesting that more frequent support was generally viewed as adequate; however, this correlation did

not exceed .70 suggesting that these two facets of social support are sufficiently distinct to examine them simultaneously as predictors (Tabachnick & Fidell, 2013).

Baseline Model of Depressive Symptoms across the Perinatal Period

A linear model of change was tested for the IDAS general depression scale using five waves of data:

Level 1: $Y_{ij} = \beta_{0j} + \beta_{1j}$ (time) + r_{ij}

Level 2: $\beta_{0j} = \gamma_{00} + \mu_{0j}$

β_{1j} (time) = $\gamma_{10} + \mu_{1j}$

where Y_{ij} is the level of symptoms at time *i* for subject *j*, β_{0j} is the intercept for subject *j* (levels of symptoms at 30 months postpartum), β_{1j} is the rate of linear change in symptoms over time for subject *j*, and r_{ij} is the residual variance in repeated measures for individual *j*, which is assumed to be independent and normally distributed. On average, maternal depression decreased from pregnancy through 30 months postpartum, $t(144) = -6.50$, $p < .001$. There was significant between-subject variability in the intercept, $\chi^2(112) = 381.16$, $p < .001$, and slope, $\chi^2(112) = 204.53$, $p < .001$. The linear model was compared to a quadratic model. On average, there was no curvilinear change in depression over time, $t(144) = 1.52$, $p = .131$, nor was there significant between-subject variability in the quadratic parameter, $\chi^2(4) = 4.70$, $p = .319$. The addition of the quadratic parameter did not improve the fit of the model, $\chi^2(3) = 6.55$, $p = .086$.

Aim 1: Main Effects of Received Support and Support Adequacy

The first aim was to examine whether trajectories of maternal depression were associated with (a) amount of received support and (b) perceived adequacy of support, controlling for maternal stress. First, separate models of received support and support adequacy were tested:

Level 1: $Y_{ij} = \beta_{0j} + \beta_{1j}$ (time) + r_{ij}

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (IF100) + γ_{02} (PLEQ) + γ_{03} (*Support*) + μ_{0j}

$\beta_{1j} = \gamma_{10} + \gamma_{11}$ (IF100) + γ_{12} (PLEQ) + γ_{13} (*Support*) + μ_{1j}

More frequent partner support during pregnancy was associated with lower levels of maternal depression at 30 months, $t(141) = -2.46$, $p = .015$, but not with rates of change in depressive symptoms over time, $t(141) = -1.18$, $p = .239$. More adequate partner support was also associated with lower levels of depression at 30 months, $t(141) = -1.95$, $p = .053$, but not with rates of change in depression over time, $t(141) = 1.05$, $p = .294$. The slope (angle) of the symptom trajectory was the same regardless of support level; however, the overall trajectory across the perinatal period was higher or lower depending on level of support. Therefore, we retained a more parsimonious model, excluding predictors of the slope parameter (β_{1j}).

Next, we examined received support and support adequacy in the same model, controlling for prenatal maternal stress:

Level 1: $Y_{ij} = \beta_{0j} + \beta_{1j}$ (time) + r_{ij}

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (IF100) + γ_{02} (PLEQ) + γ_{03} (Received Support) + γ_{04} (Support Adequacy) + μ_{0j}

$\beta_{1j} = \gamma_{10} + \mu_{1j}$

Note that the slope parameter (β_{1j}) was modeled as random. More adequate support was associated with lower levels of maternal depression, $t(140) = -2.39$, $p = .018$. More frequent support was *not* significantly associated with levels of depression, $t(140) = -0.51$, $p = .609$, when controlling for support adequacy. Prenatal flood stress (IF100), $t(140) = 2.33$, $p = .021$, and prenatal life stress (PLEQ), $t(140) = 2.49$, $p = .014$, were associated with depression controlling for received support and support adequacy.

Aim 2: Stress-Buffering Effects of Received Support and Support Adequacy

To examine partner support as a moderator of the link between prenatal flood stress and trajectories of maternal depression, we tested the following model:

Level 1: $Y_{ij} = \beta_{0j} + \beta_{1j}$ (time) + r_{ij}

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (IF100) + γ_{02} (PLEQ) + γ_{03} (*Support*) + γ_{04} (IF100 × *Support*) + μ_{0j}

$\beta_{1j} = \gamma_{10} + \gamma_{11}$ (IF100) + γ_{12} (PLEQ) + γ_{13} (*Support*) + γ_{14} (IF100 × *Support*) + μ_{0j}

Support adequacy did not interact with flood stress (IF100) to predict the intercept, $t(140) = -0.66$, $p = .509$, or slope, $t(140) = -0.83$, $p = .407$. In contrast, received support did significantly interact with flood stress. Main effect models (excluding moderation effects) had suggested that flood stress (IF100) was not associated with *rates of change* in depression over times, $t(141) = -0.66$, $p = .512$. However, a Flood Stress × Received Support interaction was significant for the slope parameter, $t(140) = -2.85$, $p = .005$, suggesting that when support is infrequent during pregnancy, greater flood stress is associated with less decline in depressive symptoms over time. Further, more frequent support weakened the association between flood stress and levels of depression at 30 months postpartum, $t(140) = -2.90$, $p = .004$.[2]

Aim 3: Main and Stress-Buffering Effects for Distinct Types of Partner Support

Taken together, results of Aims 1 and 2 indicate that a main effect model best explains the role of support adequacy in maternal depression such that more adequate support is associated with lower levels of depression, but not rates of change in symptoms (reported in Table 3). In contrast, a stress-buffering model best explained the role of received support such that stress is associated with greater linear decline in depressive symptoms over time and lower levels of depression at 30 months to the extent that women receive more frequent support (reported in Table 4). Next, we applied a main effect model of support adequacy and

[2]We also tested a model with all possible two-way and three-way interactions between received support, support adequacy, and IF100. Received Support × IF100 interactions remained significant for both the intercept, $t(136) = -3.08$, $p = .003$, and the slope, $t(136) = -2.25$, $p = .026$. Received Support × Support Adequacy and the three-way interactions, were not significant, $ps > .05$.

a stress-buffering model of received support for each of four distinct support types (i.e., informational, physical comfort, esteem/emotional, tangible).

Support adequacy was examined as a predictor of symptom levels (β_{0j}) for each of four types of support:

Level 1: $Y_{ij} = \beta_{0j} + \beta_{1j}$ (time) + r_{ij}

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (IF100) + γ_{02} (PLEQ) + γ_{03} (Support Adequacy) + μ_{0j}

$\beta_{1j} = \gamma_{10} + \mu_{1j}$

Adequate support was associated with lower levels of depression for informational support, $t(141) = -2.37$, $p = .019$, physical comfort, $t(141) = -3.77$, $p < .001$, and esteem/emotional support, $t(141) = -2.88$, $p = .005$, but not tangible support, $t(141) = -1.39$, $p = .168$. Detailed results of all main effect models (including coefficients and *SE*s) are reported in Table 3.

Next, we examined received support as a moderator of flood stress for each of four types of support:

Level 1: $Y_{ij} = \beta_{0j} + \beta_{1j}$ (time) + r_{ij}

Level 2: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (IF100) + γ_{02} (PLEQ) + γ_{03} (Received Support) + γ_{04} (IF100 × Received Support) + μ_{0j}

$\beta_{1j} = \gamma_{10} + \gamma_{11}$ (IF100) + γ_{12} (PLEQ) + γ_{13} (Received Support) + γ_{14} (IF100 × Received Support) + μ_{0j}

Flood stress (IF100) was associated with less linear decline in depression (β_{1j}) under conditions of infrequent informational support, $t(140) = -2.01$, $p = .047$, esteem/emotional support, $t(140) = -2.48$, $p = .014$, and tangible support, $t(140) = -1.69$, $p = .093$, but not physical comfort, $t(140) = -1.02$, $p = .311$. The association between flood stress (IF100) and levels of depression at 30 months (β_{0j}) was weaker to the extent that partners provided more frequent informational support, $t(140) = -2.42$, $p = .017$, esteem/emotional support, $t(140) = -2.43$, $p = .016$, and tangible support, $t(140) = -1.82$, $p = .071$, but not physical comfort, $t(140) = -1.38$, $p = .170$. (Note that the coefficients for tangible support were marginally significant.) Detailed results of all stress-buffering models (including coefficients and *SE*s) are reported in Table 4.

Discussion

The overarching goal of the present study was to conduct a systematic investigation of partner support to inform a more refined explanatory model of the role of support in perinatal maternal depression. We aimed to (a) examine the main effects of received support and support adequacy during pregnancy on trajectories of maternal depression across the perinatal period, (b) test the stress-buffering roles of received support and support adequacy to determine whether one or both facets interact with prenatal flood stress to minimize risk for depressive symptoms, and (c) apply a multidimensional model of partner support to account for distinct types of *partner* support (information, physical comfort, emotional/esteem, and tangible support).

A unique feature of the current study is the examination of partner support and maternal psychopathology at a time when the family system is under threat by a sudden-onset, external, independent stressor: a natural disaster. Other studies of stress in pregnancy may lack sufficient power if most women do not experience significant stress in their lives. In addition, studies that examine major life events (e.g., job loss) and daily hassles may be confounded by a woman's own propensity to create strife in her life, whereas a natural disaster is independent of temperament and pre-existing relationship dynamics. It is also rare to find a study of stress in pregnancy in which all women are experiencing the same stressor. Further, because the degree of exposure to the flooding varied among women, we could test dose-response relationships between the magnitude of hardship and maternal depression in a relatively controlled manner.

Results of Aim 1 suggest that partner support is not associated with *rates of change* in depressive symptoms from pregnancy to 30 months postpartum; however, both received support and support adequacy were associated with depression levels during the perinatal period. Notably, these associations are significant when controlling for prenatal maternal stress, which is one of the most robust risk factors for maternal depression (Beck, 2001; O'Hara & Swain, 1996). Partner support is not only associated with depression during the months before and after childbirth, but also beyond what is traditionally conceptualized as the postpartum period (i.e., one year following delivery). Indeed, support during pregnancy appears to have long-term implications for maternal mental health, as it is associated with less depressive symptomatology during critical periods in child development (e.g., toddlerhood) when children are especially susceptible to the effects of maternal depression (Fisher et al., 2014; Halligan et al., 2007).

When examining both facets of support simultaneously, support adequacy emerged as having predictive dominance over received support. The degree to which women were satisfied with the level of support they received from their partners (i.e., more adequate support) was associated with lower levels of maternal depression, and this appears to be more essential than providing frequent support. This finding contradicts more traditional views of support indicating that "more support is better" and is consistent with contemporary conceptualizations of partner support emphasizing the match between support that is received and support preferences (e.g., Brock & Lawrence, 2010b; Dehle et al., 2001). Indeed, support adequacy may be a key facet of support to consider when explaining perinatal maternal depression. Nonetheless, results of moderation analyses (Aim 2) suggest that received support plays a role in maternal depression, but primarily through its interaction with flood stress. Under high levels of stress, receiving frequent support may be helpful even if it is not necessarily the type of support that is desired. In contrast, support adequacy did not interact with flood stress to predict maternal depression, suggesting that its primary role is through a direct association with depressive symptoms.

Taken together, results of Aims 1 and 2 suggest that partner support impacts maternal mental health through varying and complex pathways. A stress-buffering model best explains the role of received support, which weakens the link between stress and depression. In contrast, a main effect model is better suited for explaining support adequacy: more adequate support is associated with lower depression levels regardless of stress level. This

pattern of results demonstrates the importance of examining distinct facets of support as they appear to play unique roles in maternal depression. Further, consideration of multiple facets of support helps to clarify under what conditions women may be at greatest risk for depression, and the conditions under which intimate relationships may serve the greatest protective function. To the extent that support is both adequate and frequent, women may benefit most from support. That is, when women receive higher levels of support, and the support that they receive meets their needs, risk for depression may decrease. In contrast, women who desire support but do not receive it (i.e., inadequate and infrequent support) may be at particular risk for developing depression.

Building on the results of Aims 1 and 2, we applied a stress-buffering model of received support and a main effect model of support adequacy to examine whether associations varied as a function of support type. Results of Aim 3 revealed that more frequent informational, esteem/emotional, and tangible support weakens the association between prenatal flood stress and trajectories of maternal depression; however, frequency of received *physical comfort* did not interact with prenatal flood stress. In order for support to effectively mitigate the link between flood stress and depression, it appears that support should be in the form of advice about how to best cope with a problem (*informational*), *instrumental* support that directly alleviates a problem, or communication of confidence in one's ability to handle a problem (*esteem/emotional*).

Physical comfort—a dimension of support that is unique to intimate relationships—appears to be insufficient for coping with stress resulting from a natural disaster. Further, inadequate physical comfort (e.g., too much or too little) was directly linked to higher levels of maternal depression. Therefore, it appears that partners should take care in providing this type of support given physical comfort not only fails to serve a protective function, but might also undermine mental health if it is unwanted. In contrast, providing instrumental (tangible) forms of support may be the "safest" option when there is uncertainty about how to be supportive. Indeed, inadequate tangible support was *not* associated with maternal depression, yet more frequent support of this nature interacted with flood stress. This finding is expected to generalize to other forms of stress; however, tangible types of support may be especially pertinent in the context of a natural disaster due to the types of stress encountered (e.g., substantial disruption in day-to-day activities and responsibilities, manual labor required to recover from damage).

The present study was not without limitations. First, partner support was examined during pregnancy; however, support processes may evolve and change over time, especially following childbirth when role transitions occur. In addition, given that partners were simultaneously coping with hardships from the flood, their ability to provide adequate support may have been impaired and could improve over time. Received support and support adequacy should be assessed later in the perinatal period, following childbirth. Repeated measures of support should also be examined to determine if changes in support are associated with changes in depression. Second, additional measures of relationship quality were not included in the present study; therefore, the incremental predictive utility of partner support beyond other relationship processes is unclear. Third, the sample consisted primarily of White, high SES, heterosexual couples limiting the generalizability of our

findings. Fourth, causal conclusions cannot be drawn due to the correlational nature of the study. Fifth, results may have been strengthened by multiple reports of stress and support (e.g., from both partners) to minimize correlational bias and rater specific error. It is preferential to obtain reports from both partners when assessing dyadic processes (e.g., support). Sixth, measures of depression immediately following childbirth, and during the first year postpartum, would have allowed for a more sensitive analysis of the developmental course of maternal depression. Seventh, future examinations of partner support and maternal mental health might be strengthened by multi-method (i.e., observational, self-report) examinations to capture additional facets of support transactions (e.g., solicitation behaviors) in order to best delineate support behaviors associated with mental health outcomes. Eighth, the results reflect associations among stress, partner support and depression in the context of natural disaster, and may not generalize to other forms of maternal stress and anxiety. Finally, there are many advantages to adopting a dimensional model of psychopathology; however, it is important to note that the dimensional measure used in the present study does not account for degree of impairment associated with levels of depressive symptoms.

Despite these limitations, there were numerous strengths to the present study. First, multiple facets of partner support were examined using a factor analytically derived measure of support including behaviors specific to intimate relationships. Second, depressive symptoms were examined (as opposed to diagnoses) across multiple waves spanning pregnancy to 30 months postpartum to examine the long-term effects of prenatal partner support, and to address limitations inherent in categorical approaches to studying maternal depression. Third, growth curve analytic (GCA) techniques were implemented to model change in depressive symptoms over time, and to account for varying intervals of time between assessment points across subjects. Fourth, objective measures of prenatal maternal stress were utilized, and we focused on stress resulting from a natural disaster to minimize confounds such as stress generation effects.

Theoretical and Clinical Implications

Our results have implications for the refinement of etiological models of maternal depression during the perinatal period. Evidence supporting *both* a main effect model and a stress buffering model of prenatal partner support was obtained by examining the unique roles of distinct facets of support (i.e., received support versus support adequacy). We also applied a multidimensional model to account for distinct types of *partner* support (i.e., informational, tangible, emotional/esteem, physical comfort). Our results inform a more refined conceptual framework for understanding the role of prenatal partner support in perinatal maternal depression. Inadequate support during pregnancy appears to represent a primary and distinct pathway through which maternal depression may develop during the postpartum period and beyond. This pathway appears to be independent from that of prenatal maternal stress, and has implications for maternal depression across the perinatal period up to 30 months postpartum, when children are toddlers. More frequent support (regardless of its adequacy) plays a protective role, minimizing the association between prenatal flood stress and trajectories of depression over time. We believe that these results generalize to stress arising from other natural disasters (e.g., hurricanes, tornadoes, tsunamis,

fires) which are widespread and impact millions of people each year. We also expect these findings to generalize to stress arising from sources other than natural disasters; however, this remains a direction for future research.

Results of the present study indicate that adequacy of partner support is a particularly relevant aspect of intimate relationships to consider when explaining the role of relationships in maternal depression, yet researchers rarely examine this facet. Indeed, most research is focused on global perceptions of support or counts of received support behaviors. We call for researchers to more routinely incorporate support adequacy in future research, and to also identify mechanisms explaining why inadequate support is directly linked to higher levels of maternal depression. For example, research indicates that inadequate support leads to marital discord (e.g., Brock & Lawrence, 2009; Dehle, Larsen, & Landers, 2001) which is a notable risk factor for maternal depression (O'Hara & Swain, 1996). Perhaps changes in one's intimate relationship (e.g., more conflict, less emotional intimacy and closeness) resulting from ongoing inadequate support represent key pathways through which inadequate support leads to depression.

The relative importance of prenatal partner support beyond the effects of maternal stress also demonstrates the etiological significance of intimate relationships in maternal depression. Perhaps other aspects of intimate relationships represent key protective factors to be examined. For example, recent research has demonstrated the relative importance of having a strong emotional bond with one's partner during the transition into marriage for the mental health of women (Brock & Lawrence, 2011; Brock & Lawrence, 2014a). Indeed, emotional intimacy—closely related to support but also a distinct construct—predicts depressive and anxiety symptoms during the first seven years of marriage, beyond the effects of enduring vulnerabilities (i.e., neuroticism) and stress external to the relationship.

We propose that future research include investigations of the multifaceted nature of intimate relationships, accounting for multiple processes beyond support (e.g., intimacy), to better understand their unique effects on maternal depression following childbirth. In particular, the degree to which couples are able to maintain, or even strengthen, their emotional bond during pregnancy may have important long-term implications for the family. Further, examining how relationship processes interact with one another to promote or diminish mental health is important for developing better explanatory models of perinatal maternal depression. For example, a lack of emotional intimacy in one's relationship is a key risk factor for inadequate support (Brock & Lawrence, 2014b). Future research might involve repeated measures of these processes to examine how they change in concert with one another over time leading to more or less functional intimate relationships and, subsequently, influence maternal psychopathology.

There are also clinical implications of the present research. Partner support was examined during pregnancy to inform interventions already implemented during this time period such as parenting programs and prenatal health care. Our results suggest that parenting programs might be expanded to not only include training in best parenting practices, but to also include skill-based training to strengthen the quality of the interparental relationship. In particular, social support training that emphasizes optimal match between support provided

and support desired appears advantageous to aid a couple through the transition into parenthood and the numerous challenges and changes that accompany this transition. Just as there are multiple stages to a support transaction, there are multiple points of intervention for promoting more adequate support during these exchanges. For example, a support skills module might consist of multiple components including: (a) educating each partner about their roles as support providers and the range of potential support behaviors they might provide (e.g., informational support versus physical comfort) and teaching them how to provide them most skillfully, (b) helping partners to engage in self-reflection and identification of support behaviors that tend to be more or less helpful under different circumstances, and teaching them how to most effectively ask for these types of support, (c) educating couples about the importance of not making assumptions about what one person might need when he or she is in distress, and encouraging open communication about support needs prior to providing unsolicited support, and (d) facilitating effective responsiveness behaviors when support is not welcome or is experienced as unhelpful to aid partners in soliciting more adequate support without being hurtful or alienating their partners.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Descriptive Statistics

	Possible Range		Observed Range			
variable	**Min.**	**Max.**	**Min.**	**Max.**	**Mean**	**SD**
Prenatal Flood Stress (IF00)	0	100	0	50	7.66	9.57
Prenatal Life Stress (PLEQ)	0	50	0	8	0.88	1.41
Received Support	0	100	3	100	59.76	18.92
Support Adequacy	0	25	0	25	16.63	6.62
Depressive Symptoms *M*4 mos. prior to birth	20	100	24	84	38.46	10.48
Depressive Symptoms *M*2 mos. prior to birth	20	100	22	72	37.44	9.49
Depressive Symptoms *M*16 mos. postpartum	20	100	22	60	35.51	9.20
Depressive Symptoms *M*18 mos. postpartum	20	100	22	69	33.31	9.65
Depressive Symptoms *M*30 mos. postpartum	20	100	22	67	32.54	7.88
Types of Received Support						
Informational	0	32	0	32	16.40	6.44
Physical Comfort	0	16	0	16	11.72	4.08
Esteem/Emotional	0	32	0	32	20.12	7.19
Tangible	0	20	0	20	11.51	4.86
Types of Support Adequacy						
Informational	0	8	0	8	5.49	2.37
Physical Comfort	0	4	0	4	2.44	1.65
Esteem/Emotional	0	8	0	8	5.50	2.64
Tangible	0	5	0	5	3.16	1.95

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Table 2

Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Flood Stress (IF100)																
2	Life Stress (PLEQ)	.25**															
3	Received Support	.11	.01														
4	Support Adequacy	−.01	.00	.65**													
Depressive Symptoms																	
5	*M*4 mos. prior to birth	28**	.29**	−.11	−.26**												
6	*M*2 mos. prior to birth	.15	.14	−.02	−.17	.77**											
7	*M*16 mos. postpartum	.14	.34**	−.14	−.20*	.61**	.62**										
8	*M*18 mos. postpartum	.23*	.15	−.25*	−.27**	.62**	.67**	.76**									
9	*M*30 mos. postpartum	.12	.13	−.28**	−.13	.46**	.58**	.65**	.61**								
Received Support																	
10	Informational	.11	−.09	.84**	.41**	−.11	.00	−.13	−.14	−.11							
11	Physical	.10	.02	.78**	.56**	−.11	−.12	−.14	−.25*	−.28**	.54**						
12	Esteem/Emotional	.03	.06	.88**	.64**	−.18*	−.07	−.14	−.25*	−.35**	.59**	.63**					
13	Tangible	.17*	.07	.83**	.55**	.06	.14	−.05	−.19	−.21	.61**	.56**	.64**				
Support Adequacy																	
14	Informational	−.05	−.04	.48**	.78**	−.27**	−.22*	−.14	−.22*	−.08	.42**	.32**	.44**	.40**			
15	Physical	.07	.07	.52**	.66**	−.19*	−.22*	−.18	−.21*	−.21*	.30**	.69**	.45**	.37**	.31**		
16	Esteem/Emotional	−.07	−.02	.50**	.84**	−.28**	−.11	−.22*	−.32**	−.20	.22**	.38**	.64**	.38**	.55**	.45**	
17	Tangible	.09	.02	.55**	.75**	−.06	−.01	−.09	−.10	−.06	.37**	.47**	.43**	.60**	.46**	.45**	.46**

* < .05.

** < .01.

Table 3

Main Effect Models for Support Adequacy

Predictor Variable	γ	*SE*	*t*(141)	*p*-Value
β_{0j}(Depressive Symptoms at 30 Mos.)				
Intercept, γ_{00}	32.73	0.78	42.09	<0.001
Flood Stress (IF100), γ_{01}	0.13	0.06	2.18	0.031
Life Stress (PLEQ), γ_{02}	1.48	0.59	2.51	0.013
Full Scale Support Adequacy, γ_{03}	**−0.31**	**0.09**	**−3.43**	**<0.001**
β_{1j}(Rates of Change in Symptoms)				
Intercept, γ_{10}	−0.16	0.02	−6.45	<0.001

Predictor Variable	γ	*SE*	*t*(141)	*p*-value
β_{0j}(Depressive Symptoms at 30 Mos.)				
Intercept, γ_{00}	32.76	0.79	41.34	<0.001
Flood Stress (IF100), γ_{01}	0.12	0.07	1.89	0.061
Life Stress (PLEQ), γ_{02}	1.46	0.56	2.58	0.011
Informational Support, γ_{03}	**−0.69**	**0.29**	**−2.37**	**0.019**
β_{1j}(Rates of Change in Symptoms)				
Intercept, γ_{10}	−0.16	0.02	−6.42	<0.001

Predictor Variable	γ	*SE*	*t*(141)	*p*-value
β_{0j}(Depressive Symptoms at 30 Mos.)				
Intercept, γ_{00}	32.77	0.77	42.57	<0.001
Flood Stress (IF100), γ_{01}	0.14	0.06	2.49	0.014
Life Stress (PLEQ), γ_{02}	1.58	0.56	2.82	0.006
Physical Comfort, γ_{03}	**−1.35**	**0.36**	**−3.77**	**<0.001**
β_{1j}(Rates of Change in Symptoms)				
Intercept, γ_{10}	−0.15	0.02	−6.41	<0.001

Predictor variable	γ	*SE*	*t*(141)	*p*-value
β_{0j}(Depressive Symptoms at 30 Mos.)				
Intercept, γ_{00}	32.72	0.78	42.04	<0.001
Flood Stress (IF100), γ_{01}	0.12	0.06	1.92	0.057
Life Stress (PLEQ), γ_{02}	1.47	0.58	2.55	0.012
Esteem Support, γ_{03}	**−0.65**	**0.23**	**−2.88**	**0.005**
β_{1j}(Rates of Change in Symptoms)				
Intercept, γ_{10}	−0.16	0.02	−6.48	<0.001

Predictor variable	γ	*SE*	*t*(141)	*p*-value

β_{0j}(Depressive Symptoms at 30 Mos.)				
Intercept, γ_{00}	32.76	0.78	41.83	<0.001
Flood Stress (IF100), γ_{01}	0.14	0.06	2.14	0.034
Life Stress (PLEQ), γ_{02}	1.49	0.58	2.57	0.011
Tangible Support, γ_{03}	−0.51	0.37	−1.39	0.168
β_{1j}(Rates of Change in Symptoms)				
Intercept, γ_{10}	−0.16	0.02	−6.43	<0.001

Note. IF100, PLEQ, and Support Adequacy were not associated with rates of change in symptoms, $p > .05$; therefore, they were removed as predictors of β_{1j} in the final models. β_{1j} was modeled as random. Significant parameter estimates for Support Adequacy are bolded.

Table 4

Stress-Buffering Models for Received Support

	β_{0j}(Depressive Symptoms at 30 Mos.)			β_{1j}(Rates of Change in Symptoms)		
Predictor Variable	**γ**	***SE***	***t*(140)**	**γ**	***SE***	***t*(140)**
Flood Stress (IF100)	0.18	0.08	2.15*	0.00	0.00	−0.10
Life Stress (PLEQ)	0.74	0.64	1.15	−0.03	0.03	−1.03
Received Support	−0.13	0.05	−2.64**	0.00	0.00	−1.43
IF100 × Full Scale	**−2.00**	**0.69**	**−2.90****	**−0.06**	**0.02**	**−2.85****
Flood Stress (IF100)	0.21	0.11	1.98	0.00	0.00	0.08
Life Stress (PLEQ)	0.58	0.70	0.83	−0.03	0.03	−0.98
Informational Support	−0.21	0.15	−1.43	0.00	0.00	−0.38
IF100 × Informational	**−1.91**	**0.79**	**−2.42***	**−0.05**	**0.03**	**−2.01***
Flood Stress (IF100)	0.14	0.09	1.55	0.00	0.00	−0.42
Life Stress (PLEQ)	0.97	0.68	1.44	−0.02	0.03	−0.76
Physical Comfort	−0.61	0.22	−2.79**	−0.01	0.01	−1.35
IF100 × Physical	−1.02	0.74	−1.38	−0.03	0.03	−1.02
Flood Stress (IF100)	0.07	0.08	0.90	0.00	0.00	−0.96
Life Stress (PLEQ)	1.05	0.60	1.75	−0.02	0.03	−0.79
Esteem/Emotional	−0.31	0.12	−2.58*	0.00	0.00	−0.80
IF100 × Esteem	**−1.45**	**0.60**	**−2.43***	**−0.05**	**0.02**	**−2.48***
Flood Stress (IF100)	0.18	0.12	1.58	0.00	0.00	0.18
Life Stress (PLEQ)	0.61	0.67	0.92	−0.03	0.03	−1.26
Tangible Support	−0.41	0.18	−2.21*	−0.01	0.01	−2.53*
IF100 × Tangible	**−1.86**	**1.02**	**−1.82+**	**−0.06**	**0.03**	**−1.69+**

Note. Significant parameter estimates for IF100 × Received Support are bolded.

+ < .10.

* < .05.

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** < .01.

*** < .005.

**** < .001.