

A longitudinal assessment of relationship characteristics that predict new parents' relationship satisfaction

JENNIFER A. THEISS,^a ROI ESTLEIN,^a AND KIRSTEN M. WEBER^b

^aRutgers University and ^bCentral Michigan University

Abstract

Drawing on the relational turbulence model, this study queries whether it is the amount of relational uncertainty and partner interference in a relationship, or the magnitude of an increase in these mechanisms over time, that accounts for decreased relationship satisfaction for new parents. To test these competing hypotheses, a longitudinal study of 78 couples was conducted in which both partners completed surveys about their relationship at 4 time points during the transition to parenthood. Multilevel modeling revealed that the amount and the increase of relational uncertainty and partner interference were negatively associated with relationship satisfaction when considered separately, but when evaluated in combination, the magnitude of an increase in these variables was the stronger predictor of relationship satisfaction.

The transition to parenthood is usually an exciting time for couples, but the myriad changes to the romantic relationship that accompany the birth of a first child can contribute to unexpected stressors (Gottman & Notarius, 2000; Simpson, Rholes, Campbell, Wilson, & Tran, 2002). Although some studies have shown that relationship satisfaction remains relatively stable during the transition to parenthood (e.g., Clements & Markman, 1996; Huston & Vangelisti, 1995; Kurdek, 1993), most existing research on this pivotal moment in relationships suggests that the birth of a first child is associated with a decline in relationship satisfaction (e.g., Belsky & Rovine, 1990; Cowan et al., 1985; Belsky & Cox, 2000; Elek, Hudson, & Bouffard, 2003; Glenn & McLanahan, 1982; Lawrence, Rothman, Cobb, Rothman, & Bradbury, 2008). To

explain decreases in relationship satisfaction during the transition to parenthood some scholars have pointed to ecological factors, such as cultural norms and lack of social network support (e.g., Levy-Shiff, 1994; Levy-Shiff, Dimitrovsky, Shulman, & Har-Even, 1998), and others have focused on dispositional factors, such as psychological characteristics and past relationship experiences (e.g., Antonucci & Mikus, 1988; Cowan & Cowan, 2000). The goal of this study is to more specifically highlight relationship characteristics that are salient during this transition that account for decreased relationship satisfaction following the birth of the first child.

We draw on the logic of the relational turbulence model (Solomon & Knobloch, 2001, 2004; Solomon & Theiss, 2008) to identify the relationship characteristics that predict changes in relationship satisfaction during the transition to parenthood. The relational turbulence model nominates *relational uncertainty* and *interference from partners* as relationship characteristics that are heightened during relationship transitions and make people more reactive to their relational

Jennifer A. Theiss, Roi Estlein, Department of Communication, Rutgers University; Kirsten M. Weber, Department of Communication, Central Michigan University.

Correspondence should be addressed to Jennifer A. Theiss, Department of Communication, Rutgers University, 4 Huntington St., New Brunswick, NJ 08901, e-mail: jttheiss@rutgers.edu.

circumstances. Most applications of the relational turbulence model have focused on the *amount* of relational uncertainty and interference from partners as predictors of upheaval in relationships (e.g., Solomon & Knobloch, 2004; Solomon & Theiss, 2008). An alternative explanation is that relationship partners experience turmoil when there is a *change* in the amount of relational uncertainty and partner interference they perceive in the relationship. Particularly in the long term, committed relationships where relational uncertainty and partner interference are consistently low, “high levels” of these variables are typically still below the midpoint of the scale (e.g., Knobloch, 2008; Knobloch, Miller, Bond, & Mannone, 2007; Theiss & Nagy, 2010). Thus, people may experience relational turbulence in response to a change in their baseline levels of these characteristics rather than in response to “high” amounts of those qualities.

Thus, the goals of this study are twofold. Our first objective is to draw on theory to identify relationship characteristics that contribute to decreased relationship satisfaction during the transition to parenthood. We turn to the relational turbulence model as our theoretical framework for accomplishing this goal. Our second objective is to extend the relational turbulence model by probing one of the core tenets of the model regarding the amount of relational uncertainty and partner interference, versus changes in these variables over time, as predictors of turmoil. We begin by articulating the logic behind these objectives. Then, we describe the results of a longitudinal dyadic study in which couples who were becoming first-time parents responded to surveys about their relationship at four time points during the transition to parenthood, ranging from pregnancy to 6 months after birth.

Assumptions of the relational turbulence model

The relational turbulence model argues that certain periods of relationship development are vulnerable to turmoil and give rise to extreme reactions to relationship events. Although the model was originally developed

to explain turmoil during the transition from casual to serious involvement in dating relationships (Solomon & Knobloch, 2004), scholars have more recently acknowledged that relational turbulence can arise during any transition that transforms the norms and expectations for the relationship (Solomon, Weber, & Steuber, 2010). For example, recent studies have applied the relational turbulence model to such transitions as the diagnosis of breast cancer (Weber & Solomon, 2008), the diagnosis of infertility (Steuber & Solomon, 2008), and the reunion of military couples following deployment (Theiss & Knobloch, in press; Knobloch & Theiss, in press, 2011). In this study, we apply the tenets of the relational turbulence model to better understand sources of upheaval during the transition to parenthood.

In the model, the variety of tumultuous experiences that may occur within romantic relationships during times of change are labeled *relational turbulence*, which is defined as intensified emotional, cognitive, and communicative reactions to relationship circumstances (Solomon & Knobloch, 2001, 2004). In this article, we focus on relationship satisfaction as a cognitive marker of underlying relational turbulence during the transition to parenthood. *Relationship satisfaction* refers to partners' subjective evaluation of the extent to which they feel enjoyment, contentment, and love in their romantic relationship (Hendrick, 1988). The relational turbulence model identifies two mechanisms in romantic relationships that promote heightened relational turbulence, namely, relational uncertainty and interference from partners.

Relational uncertainty refers to the lack of confidence people have in their perceptions of a relationship and it encompasses three interrelated sources of doubt: *self uncertainty* refers to the ambiguity that people have regarding their own involvement in a relationship, *partner uncertainty* refers to doubts about a partner's level of involvement in a relationship, and *relationship uncertainty* refers to doubts about the status of the relationship more generally (Knobloch & Solomon, 1999). Relational uncertainty is a persistent factor in both dating

relationships (Knobloch & Solomon, 1999) and more committed associations (Knobloch, 2008; Solomon & Theiss, 2008; Theiss & Nagy, 2010) that polarizes people's cognitive, emotional, and behavioral reactions to relationship events (e.g., Solomon & Knobloch, 2004).

Interference from partners refers to the degree to which individuals perceive their partner as undermining personal goals and actions (Solomon & Knobloch, 2001). It manifests in situations where one person's routine is interrupted by efforts to coordinate actions and establish interdependence with a relational partner (Berscheid, 1983). The process of establishing interdependence allows partners to have more influence in one another's lives, which can either facilitate one's goals or interfere with them (Knobloch & Solomon, 2002; Solomon & Knobloch, 2004). Early tests of the relational turbulence model on dating relationships argued that the early stages of relationship development provide few opportunities for influence, but as partners begin to integrate their lives, increased opportunities for influence can be disruptive to individual goals and routines. With time and practice, partners learn to establish more coordinated patterns of behavior that facilitate, rather than interfere with, one another's goals. Although the model initially argued that interference from partners should be replaced with facilitation at high levels of intimacy (Solomon & Knobloch, 2004), data indicate that partner interference does not subside but plateaus in highly intimate relationships (Solomon & Theiss, 2008). Moreover, transitional periods in relationships require changes to well-established routines, which can contribute to increased partner interference (Solomon et al., 2010). Thus, recent tests of the relational turbulence model have expanded the model's logic to identify sources of partner interference in more established relationships.

Relational uncertainty and interference from partners have been cited as direct predictors of relationship dissatisfaction (e.g., Knobloch, 2008; Knobloch & Theiss, 2011), but they are also implicated in many of the empirical explanations for decreased relationship

satisfaction that have been uncovered in prior research on the transition to parenthood. In the next section, we summarize the sources of relationship dissatisfaction that have emerged in the literature on the transition to parenthood and we explain how they may be associated with relational uncertainty and interference from partners.

The transition to parenthood as relational turbulence

The transition to parenthood is one of the most dramatic changes to occur in the course of a romantic relationship (MacDermid, Huston, & McHale, 1990; Segrin & Flora, 2005). There is a long history of research on the transition to parenthood as a crisis for couples, with studies indicating that this transition is marked by a significant decrease in relationship satisfaction (e.g., Cowan & Cowan, 2000; Cox, Paley, Burchinal, & Payne, 1999; Glenn & McLanahan, 1982; Gottman & Gottman, 2007; Hackel & Ruble, 1992; Kurdek, 1993). Research has pointed to a variety of factors that may explain declines in relationship satisfaction for new parents. Notably, most of the factors that have been identified in prior research are related to the mechanisms in the relational turbulence model that account for upheaval during relationship transitions.

One explanation for decreased relationship satisfaction is the significant decline in both physical and emotional intimacy between partners that occurs during the transition to parenthood. Verbal and nonverbal expressions of positive affection, including sexual intimacy, are decreased after the birth of the child (Belsky & Kelly, 1994; Cowan & Cowan, 2000). New parents also spend much less time together (Belsky, 1990) and engage in fewer leisure activities together as a couple (Huston & Vangelisti, 1995; MacDermid et al., 1990; Moller, Hwang, & Wickberg, 2008). Relationship partners experience less emotional intimacy and empathy during this transition (Kerem, Fishman, & Josselson, 2001). The decreased physical intimacy that corresponds with the birth of a child may contribute to questions about what sexual behaviors are now appropriate in the relationship (i.e.,

relationship uncertainty), whether or not a partner is still attracted to the other (i.e., partner uncertainty), and the extent to which individuals are motivated to maintain a relationship that lacks intimacy (i.e., self uncertainty). A lack of physical intimacy can also be seen as a source of interference in one's goal of enjoying a healthy sex life. Taken together, these circumstances may contribute to dissatisfaction for new parents.

Attachment style is another variable that has been linked to various outcomes during the transition to parenthood. One longitudinal study indicated that anxious and avoidant attachment styles were associated with increased depressive symptoms during the 2 years following the birth of the first child, and these associations were moderated by characteristics of the spousal relationship and interference from the child, respectively (Rholes et al., 2011). Another longitudinal investigation revealed that spouses with ambivalent attachment styles tended to be less satisfied following the birth of their first child, especially when they perceived limited spousal support (Rholes, Simpson, Campbell, & Grich, 2001; Simpson & Rholes, 2002; Simpson et al., 2002). In addition, individuals with preoccupied and dismissive attachment styles are unlikely to maintain relational closeness postpartum (Curran, Hazen, Jacobvitz, & Feldman, 2005). Thus, insecure attachment orientations have been linked to relatively unstable and dissatisfying outcomes of the transition to parenthood. The working models of the insecure attachment orientations compel people to doubt or question their own self-worth or their partner's intentions (Collins & Read, 1994), which is related to the types of doubts and concerns one may experience with relational uncertainty. Thus, relational uncertainty may be a theoretical mechanism that helps to organize empirical explanations linking attachment style with decreased relationship satisfaction during the transition to parenthood.

The decline in relationship satisfaction for new parents has also been attributed to the increased stress a child places on a couple's relationship (Lavee, Sharlin, & Katz, 1996). Specifically, the new responsibilities

associated with the birth of a first child can interfere in the personal goals, routines, and actions that partners enjoyed prior to becoming parents (O'Brien & Peyton, 2002). Moreover, the transition to parenthood is described as a period of traditionalization of gender roles, in which each parent begins assuming more gendered responsibilities. After the birth, wives usually take care of the interior household chores and child rearing and most husbands take care of exterior household chores and finance (Cowan & Cowan, 2000; Huston & Vangelisti, 1995; Moller et al., 2008; Rochlen, McKelley, Suizzo, & Scaringi, 2008). During this transition, then, spouses need to reestablish roles and task responsibilities, reorganize the division of housework, negotiate issues with regard to child rearing, and renegotiate existing boundaries (Claxton & Perry-Jenkins, 2008; Moller et al., 2008; Rochlen et al., 2008). The new roles and routines that partners must negotiate during the transition to parenthood create circumstances ripe for partner interference. Although research has tended to focus on ways in which the child itself impedes parents' goals (e.g., Dew & Wilcox, 2011), the ways that partners respond to their changing circumstances can also be a source of interference. For example, a new mother might experience interference from her partner if he forgets to pick up formula from the store or stops cooking healthy dinners for them every night. Similarly, a new father might experience interference from his partner if she spends an extra hour at the gym while he cares for the baby or fails to do the laundry that included a clean shirt for work.

A final factor that may influence new parents' relationship satisfaction is increased conflict during the transition to parenthood. Following the birth of the first child, spouses report a greater frequency of negative interaction, increased conflict, and more disagreement (Belsky, Lang, & Rovine, 1985; Cowan & Cowan, 2000; Crohan, 1996). A longitudinal study revealed that increased conflict during pregnancy was related to decreased relationship quality during the transition to parenthood (Kluwer & Johnson, 2007). In particular, attacking one's spouse or

leaving the scene of the conflict are associated with a decline in marital happiness for new parents (Crohan, 1996). Prior research on the relational turbulence model has shown that increased irritability and conflict are markers of relational turbulence that stem from heightened relational uncertainty and interference from partners (Solomon & Knobloch, 2004; Theiss & Knobloch, 2009; Theiss & Solomon, 2006b). Thus, the mechanisms in the relational turbulence model are strongly implicated in explanations for decreased relationship satisfaction during the transition to parenthood.

Predicting declines in relationship satisfaction

Drawing on the logic of the relational turbulence model, we nominate relational uncertainty and interference from partners as two factors that contribute to decreased relationship satisfaction during the transition to parenthood. Although prior tests of the relational turbulence model in cross-sectional data have tended to focus on the amount of relational uncertainty and partner interference as predictors of upheaval, the longitudinal data employed in this study provide a unique opportunity to challenge this assumption by focusing on the dynamic nature of the transition to parenthood. Thus, we query whether it is the *amount* of relational uncertainty and partner interference that predicts declines in relationship satisfaction for new parents, or if partners are reacting to *changes* in the amount of these variables over time.

Amount of relational uncertainty and partner interference as predictors of satisfaction

Countless studies have documented the consequences that the *amount* of relational uncertainty and interference from partners has for people's cognitive, emotional, and communicative reactions to relational episodes. With regard to cognitive reactivity, both relational features are associated with perceptions of irritations as more severe and relationally threatening (Solomon & Knobloch, 2004; Theiss & Knobloch, 2009; Theiss & Solomon,

2006b), increased suspicion over third-party rivals (Theiss & Solomon, 2006a), heightened appraisals of turmoil (Knobloch, 2007), the perceived intentionality of hurtful messages and the perceived damage they have to the relationship (Theiss, Knobloch, Checton, & Magsamen-Conrad, 2009), and decreased sexual satisfaction (Theiss & Nagy, 2010). As for emotional reactivity, relational uncertainty and interference from partners correspond with increased negative emotion (Knobloch, Miller, & Carpenter, 2007; Knobloch & Theiss, 2010), more intense feelings of hurt (Theiss et al., 2009), and with increased emotional jealousy (Knobloch, Solomon, & Cruz, 2001; Theiss & Solomon, 2006a). These two relational mechanisms are also associated with several communicative manifestations in romantic relationships, such as the tendency to withhold private information from romantic partners (Afifi & Guerrero, 2000), to avoid talking about certain topics (Knobloch & Carpenter-Theune, 2004), and to be more indirect in communication with a partner about jealousy (Theiss & Solomon, 2006a), irritations (Theiss & Knobloch, 2009; Theiss & Solomon, 2006b), sexual intimacy (Theiss, 2011), and hurt (Theiss et al., 2009).

Following the logic of the relational turbulence model, one reason for upheaval during the transition to parenthood might be the *amount* of relational uncertainty and interference from partners that people experience during this time. As predicted by the relational turbulence model, high levels of relational uncertainty and partner interference after the birth of a child should correspond with intensified reactions to relationship circumstances. Prior research has linked relational uncertainty and partner interference with sexual satisfaction (Theiss & Nagy, 2010) and relationship satisfaction (Knobloch & Theiss, 2011). Consistent with these findings, we predict that high amounts of relational uncertainty and interference from partners are negatively associated with relationship satisfaction during the transition to parenthood. Formally stated:

H1: *Self, partner, and relationship uncertainty are negatively associated with new parents' relationship satisfaction.*

H2: *Interference from partners is negatively associated with new parents' relationship satisfaction.*

Change in relational uncertainty and partner interference as predictors of satisfaction

An alternative explanation for decreased relationship satisfaction during the transition to parenthood is the *change* in relational uncertainty and partner interference from previous levels rather than the raw amount of these variables. In other words, it may not be high amounts of relational uncertainty and interference from partners that contribute to a decline in new parents' relationship satisfaction, but rather the *magnitude of the increase* in these relational mechanisms during the transition to parenthood. Prior tests of the relational turbulence model have largely focused on the amount of relational uncertainty and interference from partners as predictors of upheaval in relationships, due in part to cross-sectional research designs that prohibit the observation of change over time (e.g., Knobloch & Carpenter-Theune, 2004; Solomon & Knobloch, 2004; Theiss, 2011; Theiss & Nagy, 2010). Moreover, most studies, especially those conducted on more established and committed relationships, document extremely low mean levels of relational uncertainty and partner interference (e.g., Knobloch et al., 2007; Theiss, 2011; Theiss & Nagy, 2010); therefore, individuals who are "high" on these scales still have relatively low levels of each variable. Thus, there are conceptual and operational advantages to thinking about the change in relational uncertainty and interference from partners as predictors of tumult for new parents.

Similar to our argument that an *increase* in the mechanisms of turbulence correspond with less satisfaction in a romantic relationship, one previous study documented the reverse pattern, such that a *decrease* in relational uncertainty, rather than low amounts of uncertainty, was associated with heightened relational intimacy (Theiss & Solomon, 2008). This finding stems from the logic that the process of uncertainty reduction itself is

perceived as rewarding for relationship partners (Knobloch & Solomon, 2002; Livingston, 1980) because it helps them to "clarify ambiguities, resolve doubts, and achieve mutual understanding of the nature of their relationship" (Theiss & Solomon, 2008, p. 630). Based on this logic, we argue that the opposite is also true, such that the change in relational uncertainty and interference from partners during transitional periods in relationships is what couples perceive as dissatisfying rather than being in a cognitive state characterized by high levels of doubt and disruption. In other words, partners become dissatisfied when a relationship that was once characterized by confidence and coordination is now marked by a greater degree of uncertainty and interference. This logic is presented in the following hypotheses:

H3: *The magnitude of an increase in relational uncertainty is negatively associated with new parents' relationship satisfaction.*

H4: *The magnitude of an increase in partner interference is negatively associated with new parents' relationship satisfaction.*

In summary, we offer two competing perspectives to explain the decline in relationship satisfaction that typically accompanies the birth of the first child. On one hand, new parents' dissatisfaction might be responsive to high levels of relational uncertainty and partner interference that are triggered during this transition. On the other hand, new parents may be less satisfied because they perceive a change from what was a relatively tranquil relationship before the arrival of their child to what is now more uncertain and disruptive than they are used to. Thus, we conducted a longitudinal dyadic study to distinguish between the effects of the *amount* of relational uncertainty and partner interference versus the *change* in these variables over time. Accordingly, we offer one final research question that disentangles these explanations for decreased relationship satisfaction during the transition to parenthood:

RQ1: *Is the amount of relational uncertainty and partner interference, or*

the magnitude of an increase in relational uncertainty and partner interference, the best predictor of relationship satisfaction?

Method

To test our hypotheses and research question, we conducted a longitudinal web-based survey of couples who were navigating the transition to parenthood. We recruited participants for this study by posting announcements in online support forums for first-time parents and distributing flyers at obstetrics and gynecology (ob-gyn) offices. Individuals who were interested in participating were instructed to email the researchers, at which point they received a brief screening questionnaire to verify that they met the eligibility requirements for the study. Individuals were eligible to participate if (a) they were involved in a heterosexual romantic relationship, (b) they or their partner were pregnant with their first child, (c) the pregnancy had progressed to the second or third trimester, (d) both individuals in the relationship were the biological parents of the child, (e) the partners were cohabiting, (f) both partners were at least 18 years of age, and (g) they had Internet access in their home. When individuals indicated that they met the eligibility criteria, we requested contact information for their romantic partner so that we could obtain informed consent. If the romantic partner also consented to participate, each individual was assigned a unique username and password to access the online questionnaires. Participants completed online questionnaires at four time-points during the transition to parenthood (a) during pregnancy, (b) 1 month after birth, (c) 3 months after birth, and (d) 6 months after birth. Individuals received \$15 gift cards to a national retailer for completing the first and last waves of the study and \$10 gift cards for completing the second and third waves of the study.

Participants

A total of 78 couples (156 individuals) participated in the study. Across the four waves of the study, the response rate for each survey ranged from 97% to 77%. Participants

ranged in age from 18 to 48 years, with a mean age of 28.38 years.¹ The majority of the sample was Caucasian (83.2%), with an additional 5.8% Hispanic, 3.9% Indian, 3.2% African American, 3.2% Native American, 1.9% Asian/Pacific Islander, and 2.6% Other.² With regard to relationship status, 68 couples were married, 6 couples were engaged to be married, and 4 couples were cohabiting but not married. Couples had been in their current level of relationship status for an average of 2.47 years (range = 3 months to 10 years). Most couples indicated that their pregnancy was planned (67.09%). In addition, 21.05% of couples previously had a pregnancy that resulted in miscarriage or stillbirth.

Procedures

The questionnaires for each wave of the study were administered through an Internet website. Respondents submitted their survey responses online and data were stored on a secure server. The prebirth questionnaire obtained demographic and relational information and they completed closed-ended scales to report their perceptions of relationship satisfaction, relational uncertainty, and partner interference. The subsequent waves of the study at 1 month, 3 months, and 6 months postbirth began with an open-ended question in which participants were asked to give an account of the ways in which their relationship had changed since completing the previous questionnaire. They also included the same measures of relationship satisfaction, relational uncertainty, and partner interference that were included in the prebirth questionnaire.

Measures

A variety of closed-ended Likert-type scales were used to operationalize the variables

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1. Bivariate correlations revealed that respondent age was not significantly associated with any of the variables in this study; thus, age was not included as a moderator in our analyses.
 2. The percentages for ethnicity sum to more than 100% because participants were instructed to check all ethnicities that applied.

in this study. Confirmatory factor analyses (CFAs) were conducted on all multi-item scales to ensure they met the criteria of face validity, internal consistency, and parallelism (Hunter & Gerbing, 1982). CFAs were conducted using data from the first wave of the study, and the same factor structure was used to calculate variables in the subsequent waves to ensure consistency. All items that were retained had a factor loading greater than .75. Criteria for an acceptable model fit were set at $\chi^2/df < 3$, confirmatory fit index (CFI) $> .95$, and root mean square error of approximation (RMSEA) $< .08$ (Brown & Cudek, 1993). After confirming unidimensionality, composite scores were calculated for each scale by averaging responses across items. See Table 1 for a summary of descriptive statistics for each scale during each wave of the study.

Relationship satisfaction

We developed items to measure relational satisfaction. Participants used a 7-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*) to indicate their level of agreement with five items: (a) I am completely satisfied with my relationship, (b) I am very happy with all aspects of my relationship, (c) I am content with my partner, (d) some things about this relationship make me unhappy (reverse coded), and (e) this relationship is gratifying to me ($\chi^2/df = 1.88$, CFI = .99, RMSEA = .07; $\alpha = .85$).

Relational uncertainty

We used Knobloch's (2008) scale that measures the sources of relational uncertainty in marriage. Respondents used a 6-point Likert-type scale from 1 (*completely or almost completely uncertain*) to 6 (*completely or almost completely certain*) to respond to items that were preceded by the stem, "How certain are you about ...?" All items were reverse coded so that the resulting measure indexed relational uncertainty. The *self uncertainty* scale consisted of four items: (a) your feelings about your relationship, (b) your goals for the future of your relationship, (c) your view of your relationship, and (d) the importance of the relationship

to you ($\chi^2/df = 2.16$, CFI = .97, RMSEA = .08; $\alpha = .92$). *Partner uncertainty* was measured with four items: (a) your partner's view of your relationship, (b) the importance of your relationship to your partner, (c) your partner's goals for the future of your relationship, and (d) how your partner feels about your relationship ($\chi^2/df = 2.45$, CFI = .97, RMSEA = .08; $\alpha = .92$). The *relationship uncertainty* scale included four items: (a) the current status of your relationship, (b) how you can or cannot behave around your partner, (c) the definition of your relationship, and (d) the future of your relationship ($\chi^2/df = 2.08$, CFI = .98, RMSEA = .08; $\alpha = .77$).

Interference from partners

Solomon and Knobloch's (2001) scale was used to measure partner interference. Participants used a 6-point Likert-type scale from 1 (*strongly disagree*) to 6 (*strongly agree*) to indicate their level of agreement with five items: (a) this person interferes with the achievement of everyday goals I set for myself, (b) this person interferes with the amount of time I spend with my friends, (c) this person interferes with my ability to use my time well, (d) this person interferes with the things I need to do each day, and (e) this person interferes in my ability to make plans ($\chi^2/df = 1.99$, CFI = .99, RMSEA = .08; $\alpha = .85$).

Increase in relational uncertainty and partner interference³

We also computed variables measuring an increase in the sources of relational uncertainty and interference from partners. These

3. One common concern about change scores is that they compound measurement error because error is contributed by each score used in the computation (Harris, 1963). To obtain a more accurate assessment of the reliability of the change scores, we squared the coefficient α for each of the independent variables as measured in the prebirth questionnaire. Applying the product rule in this way provides a general estimate of the constraint imposed on the reliability of the change score by error within each component variable (Anderson & Gerbing, 1982). With the exception of relationship uncertainty ($\alpha^2 = .59$), the squared reliability estimates for self uncertainty ($\alpha^2 = .85$),

Table 1. Descriptive statistics for all variables in each wave of the study

	Prebirth survey	1-month survey	3-month survey	6-month survey
Sample size (<i>N</i>)	151	144	122	119
Relational satisfaction	6.07 (1.01)	6.11 (1.01)	5.51 (1.06)	5.49 (1.12)
Self uncertainty	1.26 (0.51)	1.28 (0.49)	1.33 (0.56)	1.33 (0.54)
Partner uncertainty	1.65 (0.80)	1.45 (0.73)	1.50 (0.77)	1.56 (0.89)
Relationship uncertainty	1.30 (0.50)	1.29 (0.54)	1.35 (0.54)	1.42 (0.66)
Interference from partners	1.65 (1.01)	1.62 (0.86)	1.82 (1.10)	1.87 (1.01)

Note. Cell entries are means. Values in parentheses are standard deviations.

variables were computed by subtracting the level of each variable in one wave of the study from the level of that same variable in the subsequent wave of the study (self uncertainty Δ : range = -4.00 to 3.00 , $M = .02$, $SD = 0.55$; partner uncertainty Δ : range = -3.25 to 3.00 , $M = -.10$, $SD = 0.64$; relationship uncertainty Δ : range = -2.50 to 2.50 , $M = .02$, $SD = 0.47$; interference from partners Δ : range = -2.80 to 5.00 , $M = .09$, $SD = 0.82$). Thus, positive values represent the magnitude of an increase in relational uncertainty and partner interference, and negative values represent the magnitude of a decrease in relational uncertainty and partner interference.

Analyses

Preliminary analyses

As a starting point, we conducted paired-samples *t* tests on all variables in each wave of the study to evaluate mean differences in our variables between male partners and female partners. Results indicated no significant differences in the prebirth survey. In the 1st month after birth, there was a significant difference in relationship uncertainty, $t(61) = 2.49$, $p < .05$, such that male partners ($M = 1.33$) experienced more relationship uncertainty than female partners ($M = 1.19$). In the 3rd month after birth, there were significant differences in interference from partners, $t(51) = -2.27$, $p < .05$;

self uncertainty, $t(51) = -2.11$, $p < .05$; and relationship uncertainty, $t(51) = -2.09$, $p < .05$, such that male partners reported more partner interference ($M = 1.94$), self uncertainty ($M = 1.38$), and relationship uncertainty ($M = 1.39$) than females ($M = 1.61$, $M = 1.22$, $M = 1.25$, respectively). Similarly, the 6th month after birth revealed significant differences in interference from partners, $t(51) = -2.30$, $p < .05$, male $M = 2.01$, female $M = 1.71$; self uncertainty, $t(50) = -2.22$, $p < .05$, male $M = 1.35$, female $M = 1.16$; and relationship uncertainty, $t(49) = -2.06$, $p < .05$, male $M = 1.42$, female $M = 1.23$.⁴

Next, we assessed the bivariate correlations among all of the variables in data from the first wave of the study (Table 2). Results indicated that the three sources of relational uncertainty were all positively interrelated, and they

4. Given that several of our variables revealed sex differences in the later waves of the study, we investigated the potential moderating effect of respondent sex in our substantive analyses. We incorporated sex in two ways. First, we entered respondent sex as an uncentered covariate on the intercept in the model. Second, we included respondent sex as an uncentered covariate on each of the substantive slopes in the model. Results indicated that respondent sex did not alter the value of the intercept in any of the models. In addition, with one exception, respondent sex did not moderate any of the slopes in the models. The only sex difference to emerge in the substantive analyses was for the amount of interference from partners predicting relationship satisfaction, such that females were significantly less satisfied under conditions of partner interference than males. Because sex differences were not widespread, we did not include respondent sex as a covariate in the substantive analyses.

partner uncertainty ($\alpha^2 = .85$), and interference from partners ($\alpha^2 = .72$) were acceptable.

Table 2. Bivariate correlations among all variables

	1	2	3	4	5
1. Relationship satisfaction					
2. Self uncertainty	-.56***				
3. Partner uncertainty	-.59***	.56***			
4. Relationship uncertainty	-.74***	.72***	.69***		
5. Interference from partners	-.57***	.31***	.35***	.44***	

Note. Correlations were calculated using data from the first wave of the study.

*** $p < .001$.

were all positively associated with partner interference and negatively associated with relationship satisfaction. Interference from partners was also negatively associated with relationship satisfaction.

We also calculated the intraclass correlation (ρ) for relationship satisfaction as the dependent variable in this study. The intraclass correlation calculates the total variability in the dependent variable that is attributable to between-persons and between-groups variance, as opposed to within-person variance. An intraclass correlation that is close to 0 indicates that most of the variability in the dependent variable is attributable to within-person variance, and an intraclass correlation that is close to 1 indicates that most of the variability is attributable to between-persons and between-groups variance (Kreft & De Leeuw, 2002; Snijders & Bosker, 2003). The intraclass correlation for relationship satisfaction ($\rho = .16$) indicates that the majority of the variability is attributable to within-person variance across waves of the study.

Substantive analyses

The longitudinal analyses focused on how the amount of relational uncertainty and partner interference corresponded with concurrent reports of relationship satisfaction during the same wave of the study, and on how the change in relational uncertainty and partner interference from the previous wave

corresponded with concurrent reports of relationship satisfaction. The data were analyzed using hierarchical linear modeling 6.0 (HLM) software, which is designed to accommodate nonindependent or nested data (Bryk & Raudenbush, 1992). We evaluated our hypotheses using a full maximum likelihood, three-level model with repeated measures as Level 1 variables, stable individual characteristics as Level 2 variables, and dyadic characteristics as Level 3 variables. Predictors were entered into the model as uncentered variables, group mean-centered variables (i.e., centered around the individual's mean across waves of the study), or grand mean-centered variables (i.e., centered around the sample mean). Intercepts were estimated as random effects and slopes were estimated as fixed effects.

To conduct our analyses, we configured the data so that the sources of relational uncertainty, partner interference, and relationship satisfaction during the previous wave (Wave $T-1$) were combined with measures of the same variables and change scores in the subsequent wave (Wave T). In each of our analyses, relationship satisfaction for Wave T was treated as the dependent variable, so we controlled for the level of relationship satisfaction reported during the previous wave ($T-1$) in our analyses. Relationship length measured during the first wave was included as a covariate on Level 3 intercept and was entered as grand mean-centered to control for differences in relationship satisfaction between couples with longer or shorter relationships. To test H1 and H2, each of the facets of relational uncertainty and partner interference, as measured in Wave T , were entered as predictors in separate models. The predictors were entered as group mean-centered to determine how deviations around the individual mean of that variable corresponded with perceptions of the dependent variable. To test H3 and H4, the change score for each of the relational uncertainty variables and partner interference were entered as uncentered predictors in separate models. We also included the within-subject mean for the corresponding independent variable in each model as a covariate on the Level 2 intercept to discern

the within-person effect from the between-persons effect. See the Appendix for equations.

Our final model included both the amount and the change in each independent variable as predictors in the same model to determine which mechanism best predicts decreased satisfaction. Again, relationship satisfaction in Wave T was the dependent variable in this model. We included relationship length on the Level 3 intercept to control for between-couple differences in relationship satisfaction. We also included relationship satisfaction in Wave $T-1$ as a covariate in the model. The amount of self, partner, and relationship uncertainty or partner interference in Wave T were entered as group mean-centered predictors in separate models. The within-person mean for the corresponding variable was also entered on the Level 2 intercept to control for between-person variation in relational uncertainty. We

also included the change in the corresponding independent variable as uncentered predictors. See the Appendix for equations.

Results

Recall that our first set of hypotheses predicted that the amount of relational uncertainty (H1) and partner interference (H2) are negatively associated with relationship satisfaction (Table 3). The between-person effects are reflected in the results for the within-person means on the intercept and they indicate that individuals with above average levels of relational uncertainty and partner interference reported less relationship satisfaction. Length of relationship was not significantly associated with relationship satisfaction. The within-person effects are represented in the slopes and revealed that relational uncertainty and partner interference were negatively associated with relationship satisfaction over

Table 3. Amount of relational uncertainty and partner interference predicting concurrent relationship satisfaction

	Self uncertainty	Partner uncertainty	Relationship uncertainty	Interference from partners
Intercept	4.27***	3.50***	3.96***	2.96***
Relationship length	-0.00	-0.00	-0.00	-0.00
Self uncertainty mean	-0.92***			
Partner uncertainty mean		-0.50***		
Relationship uncertainty mean			-0.79***	
Interference from partners mean				-0.33***
Slopes				
Relationship satisfaction $_{(T-1)}$	0.44***	0.51***	0.47***	0.56***
Self uncertainty $_{(T)}$	-.78***			
Partner uncertainty $_{(T)}$		-0.46***		
Relationship uncertainty $_{(T)}$			-0.84***	
Interference from partners $_{(T)}$				-0.29***
Residuals				
Intercept $_{(Level1)}$	0.00	0.00	0.00	0.00
Intercept $_{(Level2)}$	0.04**	0.00	0.02	0.01

Note. The dependent variable in each model is relationship satisfaction in Wave T . Coefficients are unstandardized. Cell entries in the intercept category are the change in the intercept attributable to relationship length or the within-person mean, which represents the between-persons effect on that variable. The cell entries in the slopes category represent the within-person slope over the course of the study. The cell entries in the residuals category are τ and represent the remaining unexplained variation in the intercept. Self, partner, and relationship uncertainty and interference from partners were entered in separate models and their effects are represented on the diagonal.

** $p < .01$. *** $p < .001$.

time. Thus, H1 and H2 were supported. The residuals indicated that there was significant variability left to explain in the Level 2 intercept for the model in which self uncertainty was the predictor.

Our second set of hypotheses predicted that the change in relational uncertainty (H3) and partner interference (H4) from one wave to the next was negatively associated with concurrent relationship satisfaction (Table 4). Again, relationship length did not alter the value of the intercept. The between-person effects on the intercept revealed that individuals with above average levels of relational uncertainty and partner interference reported significantly less relationship satisfaction. The within-person effects showed that an increase in relational uncertainty or partner interference from one wave to the next was negatively associated with relationship satisfaction. Thus, the hypotheses were supported.

Residuals showed no variability left to be explained in the intercepts for the model.

One final set of analyses examined the amount of relational uncertainty and partner interference, as well as the change in those variables over time, as predictors in the same model to distinguish between these competing explanations for decreased relationship satisfaction during the transition to parenthood (Table 5). Again, relationship length did not significantly alter the intercept, but there were between-person differences such that individuals with above average relational uncertainty and partner interference reported less relationship satisfaction. With regard to the slopes, results indicated that the amount of relationship uncertainty and partner interference were nonsignificant in all of the models. In contrast, the change in relational uncertainty and partner interference were significant, such that an increase in relational uncertainty and partner interference from one

Table 4. Change in relational uncertainty and partner interference predicting subsequent relationship satisfaction

	Self uncertainty	Partner uncertainty	Relationship uncertainty	Interference from partners
Intercept	3.18***	3.19***	2.93***	2.60***
Relationship length	0.00	-0.01	-0.00	-0.01
Self uncertainty mean	-0.64***			
Partner uncertainty mean		-0.46***		
Relationship uncertainty mean			-0.53***	
Interference from partners mean				-0.29***
Slopes				
Relationship satisfaction _(T-1)	0.57***	0.55***	0.60***	0.62***
Δ Self uncertainty	-0.52***			
Δ Partner uncertainty		-0.29**		
Δ Relationship uncertainty			-0.57***	
Δ Interference from partners				-0.24***
Residuals				
Intercept _(Level1)	0.00	0.00	0.00	0.00
Intercept _(Level2)	0.00	0.00	0.00	0.00

Note. The dependent variable in each model is relationship satisfaction in Wave *T*. Coefficients are unstandardized. Cell entries in the intercept category are the change in the intercept attributable to relationship length or the within-person mean, which represents the between persons effect on that variable. The cell entries in the slopes category represent the within-person slope over the course of the study. The cell entries in the residuals category are τ and represent the remaining unexplained variation in the intercept. Changes in self, partner, and relationship uncertainty and interference from partners were entered in separate models and their effects are represented on the diagonal.

** $p < .01$. *** $p < .001$.

Table 5. Amount of relational uncertainty and partner interference versus change in predicting subsequent relationship satisfaction

	Self uncertainty	Partner uncertainty	Relationship uncertainty	Interference from partners
Intercept	3.27***	3.29***	3.14***	2.64***
Relationship length	-0.00	-0.00	-0.00	-0.00
Self uncertainty mean	-0.66***			
Partner uncertainty mean		-0.47***		
Relationship uncertainty mean			-0.59***	
Interference from partners mean				-0.29***
Slopes				
Relationship satisfaction _(T-1)	0.56***	0.53***	0.57***	0.61***
Self uncertainty _(T)	-0.18			
Partner uncertainty _(T)		-0.23		
Relationship uncertainty _(T)			-0.31	
Interference from partners _(T)				-0.06
Δ Self uncertainty	-0.46***			
Δ Partner uncertainty		-0.21*		
Δ Relationship uncertainty			-0.44***	
Δ Interference from partners				-0.21**
Residuals				
Intercept _(Level1)	0.00	0.00	0.00	0.00
Intercept _(Level2)	0.00	0.00	0.00	0.00

Note. The dependent variable in each model is relationship satisfaction in Wave T . Coefficients are unstandardized. Cell entries in the intercept category are the change in the intercept attributable to relationship length or the within-person mean, which represents the between-persons effect on that variable. The cell entries in the slopes category represent the within-person slope over the course of the study. The cell entries in the residuals category are τ and represent the remaining unexplained variation in the intercept. Self, partner, and relationship uncertainty and interference from partners were entered in separate models and their effects are represented on the diagonal.

* $p < .05$. ** $p < .01$. *** $p < .001$.

wave to the next were negatively associated with relationship satisfaction. Residuals indicated no variability left to explain in the intercept. Thus, the results of this analysis point to an increase in relational uncertainty and partner interference as the only predictor of relationship satisfaction when the concurrent amount of these variables is covaried.

Discussion

This study drew on the relational turbulence model to offer competing explanations for decreased relationship satisfaction among first-time parents. On one hand, the relational turbulence model highlights the *amount* of relational uncertainty and interference from

partners as predictors of dissatisfaction. On the other hand, we reasoned that it may be the *change* from a relatively certain and coordinated relationship to one that is more uncertain and disruptive that predicts a decrease in relationship satisfaction. When evaluated separately, results indicated that both the amount and the change in relational uncertainty and partner interference were viable explanations for decreased relationship satisfaction during the transition to parenthood. When evaluated together, the change in these variables emerged as the only significant predictor of relationship satisfaction. In this section, we discuss these results with regard to their implications for the literature on the transition to parenthood and for the relational turbulence model.

Explaining challenges during the transition to parenthood

An ever-expanding literature consistently points to the transition to parenthood as a tumultuous time in the trajectory of romantic relationships. Studies suggest that couples experience less physical and emotional intimacy (Belsky & Kelly, 1994), engage in fewer joint activities (Moller et al., 2008), communicate less frequently (Salmela-Aro, Aunola, Saiato, Halmesmaki, & Nurmi, 2006), and engage in more conflict (Cowan & Cowan, 2000). Moreover, the majority of research on this transition points to decreased relationship satisfaction after the arrival of a baby (Glenn & McLanahan, 1982; Kurdek, 1993; Schulz, Cowan, & Cowan, 2006). Our study adds to the growing body of literature that points to a decline in relationship satisfaction during the transition to parenthood, but we nominate two new variables that predict this outcome: relational uncertainty and interference from partners.

Although many studies point to the hardships that accompany the birth of a first child, the literature is lacking in terms of theoretically driven explanations for the challenges that emerge during this transition (see Simpson et al., 2002). Our study draws on the relational turbulence model as a theoretical framework that helps to explain why the transition to parenthood might be characterized by tumult, distress, and dissatisfaction. Specifically, our results indicate that relational uncertainty and interference from partners are two mechanisms in romantic relationships that correspond with dissatisfaction. Although many studies of new parents have identified sources of hardship after the arrival of a new baby, relatively fewer studies have articulated how those experiences are associated with relational mechanisms that are linked to decreased satisfaction (see Elliston, McHale, Talbot, Parmley, & Kuersten-Hogan, 2008; Van Egeren, 2004). Relational uncertainty and interference from partners are two mechanisms inherent to relationship functioning that may mediate the association between a variety of relationship events (e.g., decreased physical

intimacy, increased conflict) and relationship dissatisfaction.

With regard to relational uncertainty, there are a variety of experiences during the transition to parenthood that might contribute to doubts about one's commitment to the relationship. Women go through a number of psychological, emotional, and physical changes during pregnancy (Devine, Bove, & Olson, 2000), which might ignite questions over whether or not her partner is still attracted to her postpregnancy body, whether or not he understands her emotional needs, and whether or not she can still connect with him on an intimate level. Similarly, men may question if their partner will continue to invest in the romantic relationship now that her attention is divided between her roles as a mother and a relationship partner (Finnbogadóttir, Crang-Svalenius, & Persson, 2003). A number of studies point to decreased intimacy following the birth of a child (Cowan & Cowan, 2000; Twenge, Campbell, & Foster, 2003), which can raise doubts over the viability of that romantic relationship over time. Thus, we are encouraged by the utility of relational uncertainty as one variable that helps to explain people's reactivity during the transition to parenthood.

Interference from partners is also an explanatory mechanism that helps to organize existing findings regarding relationship challenges following the birth of a child. Studies consistently show a redistribution of roles and responsibilities between new parents (Claxton & Perry-Jenkins, 2008; Dew & Wilcox, 2011), which is at the heart of partner interference. Relationship partners may be discouraged and frustrated in their efforts to keep a clean house, schedule a daily workout, acquire groceries, or stay late at the office now that they have to renegotiate these routines with their partner. Thus, interference from partners is another variable that is useful for understanding why relationship partners struggle during the transition to parenthood. In combination, support for relational uncertainty and partner interference as predictors of new parents' relational dissatisfaction highlights the utility of the relational turbulence model for explaining

heightened reactivity during the transition to parenthood.

Extending the relational turbulence model

This study also extends the relational turbulence model conceptually and operationally. One way in which this study expands the relational turbulence model is by applying it to a salient transition in the development of romantic relationships. Originally, the relational turbulence model was intended to explain heightened reactivity to relationship circumstances during the transition from casual to serious involvement in dating relationships (Solomon & Knobloch, 2004; Solomon & Theiss, 2008). More recently, the model has gained traction as a tool for explaining upheaval during various transitional moments in more established romantic relationships (Solomon et al., 2010), such as the diagnosis of breast cancer (Weber & Solomon, 2008), coping with infertility (Steuber & Solomon, 2008), and the reunion of military couples following deployment (Knobloch & Theiss, 2011, in press; Theiss & Knobloch, in press). To this list, we add the transition to parenthood as a relationship experience that is characterized by turmoil and marked by relational uncertainty and interference from partners. The model is fruitful in this context because it helps to organize a literature that is currently devoid of theory and it points specifically to relationship processes that explain why new parents face relational challenges during this transition.

Beyond the application of the relational turbulence model in a new context, this study marks an important contribution to the model because it is the first to longitudinally document a relationship transition as it occurs. Most of the studies that examine transitions in established relationships have two shortcomings: (a) they are cross-sectional in nature and (b) they are focused on individuals or dyads who have already experienced the transition and are currently responding to the aftermath in their relationship (e.g., Knobloch & Theiss, in press; Steuber & Solomon, 2008; Weber & Solomon, 2010). Even the longitudinal studies that were conducted in dating

relationships surveyed individuals and dyads at various stages of relationship development and could not guarantee that partners made the transition from casual to serious involvement during the course of the study (e.g., Knobloch & Theiss, 2010; Solomon & Theiss, 2008). By recruiting couples during pregnancy and tracking changes to their relationship following the birth of their child, our study evaluates the transition to parenthood as it unfolds. Thus, as the relational turbulence model expands to consider transitional periods in more established relationships, more studies are needed that are capable of documenting those transitions from beginning to end.

Operationally, this study also extends the relational turbulence model by investigating the nature of relational uncertainty and partner interference as variables that are reflective of change. Whereas the vast majority of studies that employ the relational turbulence model focus on the amount of relational uncertainty and interference from partners as predictors of upheaval, we offered competing hypotheses that examined the magnitude of an increase in these variables as predictors of relational outcomes. Results indicated that the change in relational uncertainty and interference from partners were stronger predictors of relationship satisfaction than the raw amounts of those variables. These findings lay a foundation for thinking about the mechanisms of the relational turbulence model in a different way.

Although scholars have consistently used the amount of relational uncertainty and interference from partners as predictors in the relational turbulence model, this strategy raises at least two issues. First, individuals in romantic relationships, especially highly committed relationships, tend to report low levels of relational uncertainty and partner interference. In most studies, the mean for each variable is well below the midpoint of the scale. Thus, comparisons of individuals with low versus high amounts of the variable are really contrasting individuals with low and lower amounts of the variable. Second, the scales measure people's global assessments of relational uncertainty and partner interference, so

they are not sensitive to episodic spikes in each variable at any given time. The items that measure these variables ask respondents to reflect on their relationship generally, so even during turbulent transitions, respondents might respond in a way that reflects their typical feelings about their relationship rather than their feelings about the relationship in that moment. Although the amount of relational uncertainty and partner interference might be a suitable predictor in cross-sectional studies, research that employs longitudinal designs might consider calculating the increase or decrease in those variables as a more meaningful predictor of reactivity in relationships.

Strengths, limitations, and future directions

Our study has some significant strengths, but also a few weaknesses that should be acknowledged. The first strength of this study is the longitudinal nature of the data. One benefit of a longitudinal design is that it enabled us to measure changes in relationship characteristics from one wave of the study to the next. Specifically, we were able to observe how a change in relationship functioning predicted subsequent reactions to relationship events. Another strength of this study is the use of dyadic data, which takes into account the relationship experiences of both partners during the transition to parenthood. Many studies have focused on the ways in which motherhood has relational implications for women (e.g., Goldstein, Diener, & Mandelsdorf, 1996; Horowitz & Damato, 1999; Porter & Hsu, 2003), but relatively fewer studies have focused on the struggles that men face as they become fathers (but see Finnboadóttir et al., 2003). Moreover, studies that have examined the experiences of both mothers and fathers surveyed individuals, rather than dyads (e.g., Cowan & Cowan, 2000; Delmore-Ko, Pancer, Hunsberger, & Pratt, 2000). By surveying both mothers and fathers from the same couple, we were able to obtain a more complete picture of this experience.

There are also a few weaknesses of this study. First, our inclusion criteria required that couples be in their second or third trimester in order to participate because we wanted to

avoid the potential for miscarriage (which is heightened during the first trimester), but we acknowledge that the transition to parenthood may begin before couples get to this point. Relationships may begin to change at the point couples decide to try for a pregnancy, when they become pregnant, and during the first trimester as they start to prepare their lives for a new addition. Similarly, changes to the romantic relationship are likely to continue past the 6th month after a child is born, but limited resources prevented a more long-term study. Although we successfully captured part of the transition, our study falls short in terms of documenting the full length of time in which partners experience relationship change. Another limitation of this study is that we limited participation to couples who were the biological parents of their child. Thus, our results do not generalize to couples who are going through the experience of adoption, which may present an array of other challenges not reflected in these results.

In conclusion, this study used a longitudinal research design to distinguish between the mechanisms in the relational turbulence model that are responsible for decreased relationship satisfaction during the transition to parenthood. Our findings suggest that it is not necessarily high amounts of relational uncertainty and partner interference that contribute to dissatisfaction, but rather an increase in these relationship variables over time. These results are significant because they apply theory to the literature on the transition to parenthood and they extend the relational turbulence model by evaluating the influence that its core mechanisms have on relationship outcomes. Future research on new parents should continue to investigate more theoretically driven hypotheses, and future tests of the relational turbulence model should consider alternatives to evaluating the mechanisms of turbulence. We are hopeful that future research will embrace these recommendations to further disentangle the challenges that face new parents.

References

- Afifi, W. A., & Guerrero, L. K. (2000). Motivations underlying topic avoidance in close relationships. In

- S. Petronio (Ed.), *Balancing the secrets of private disclosures* (pp. 165–179). Mahwah, NJ: Erlbaum.
- Antonucci, T. C., & Mikus, K. (1988). The power of parenthood: Personality and attitudinal changes during the transition to parenthood. In G. Y. Michaels & W. A. Goldberg (Eds.), *The transition to parenthood: Current theory and research* (pp. 62–84). New York, NY: Cambridge University Press.
- Belsky, J. (1990). Children and marriage. In F. D. Finchman & T. A. Bradbury (Eds.), *The psychology of marriage: Basic issues and applications* (pp. 172–200). New York, NY: Guilford.
- Belsky, J., & Kelly, J. (1994). *The transition to parenthood: How a first child changes a marriage. Why some couples grow closer and others apart*. New York, NY: Dell.
- Belsky, J., Lang, M. E., & Rovine, M. (1985). Stability and change in marriage across the transition to parenthood: A second study. *Journal of Marriage and the Family*, 47, 855–865.
- Belsky, J., & Rovine, M. (1990). Patterns of marital change across the transition to parenthood: Pregnancy to three years postpartum. *Journal of Marriage and the Family*, 52, 5–19.
- Berscheid, E. (1983). Emotion. In H. H. Kelley, E. Berscheid, A. Christensen, J. Harvey, T. L. Huston, G. Levinger, et al. (Eds.), *Close relationships* (pp. 110–168). San Francisco, CA: Freeman.
- Brown, M. W., & Cudek, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.
- Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage.
- Claxton, A., & Perry-Jenkins, M. (2008). No fun anymore: Leisure and marital quality across the transition to parenthood. *Journal of Marriage and the Family*, 70, 28–43.
- Clements, M., & Markman, H. (1996). The transition to parenthood: Is having children hazardous to marriage? In N. Vanzetti & S. Duck (Eds.), *A lifetime of relationships* (pp. 290–310). Pacific Grove, CA: Brooks/Cole.
- Collins, N. L., & Read, S. J. (1994). Cognitive representations of attachment: The structure and function of working models. In K. Bartholomew & D. Perlman (Eds.), *Attachment processes in adulthood* (pp. 53–90). London, UK: Kingsley.
- Cowan, C. P., & Cowan, P. A. (2000). *When partners become parents: The big life change for couples*. Mahwah, NJ: Erlbaum.
- Cowan, C. P., Cowan, P. A., Heming, G., Gerratt, E., Coysh, W. S., Curtis-Boles, H., & Boles A. J. (1985). Transition to parenthood: His, hers, and theirs. *Journal and Family Issues*, 6, 451–481.
- Cox, M. J., Paley, B., Burchinal, M., & Payne, C. C. (1999). Marital perceptions and interactions across the transition to parenthood. *Journal of Marriage and the Family*, 61, 611–625.
- Crohan, S. E. (1996). Marital quality and conflict across the transition to parenthood in African American and White couples. *Journal of Marriage and the Family*, 58, 933–944.
- Curran, M., Hazen, N., Jacobvitz, D., & Feldman, A. (2005). Representations of early family relationships predict marital maintenance during the transition to parenthood. *Journal of Family Psychology*, 19, 189–197.
- Demo, D. H., & Cox, M. J. (2000). Families with young children: A review of research in the 1990s. *Journal of Marriage and the Family*, 62, 876–896.
- Devine, C. M., Bove, C. F., & Olson, C. M. (2000). Continuity and change in women's weight orientations and lifestyle practices through pregnancy and the postpartum period: The influence of life course trajectories and transitional events. *Social Sciences and Medicine*, 50, 567–582.
- Dew, J., & Wilcox, W. B. (2011). If Momma ain't happy: Explaining declines in marital satisfaction among new mothers. *Journal of Marriage and Family*, 73, 1–12.
- Elek, S. M., Hudson, D. B., & Bouffard, C. (2003). Marital and parenting satisfaction and infant care self-efficacy during the transition to parenthood: The effect of infant sex. *Issues in Comprehensive Pediatric Nursing*, 26, 45–57.
- Elliston, D., McHale, J., Talbot, J., Parmley, M., & Kursten-Hogan, R. (2008). Withdrawal from coparenting interactions during early infancy. *Family Processes*, 47, 481–499.
- Finnbogadóttir, H., Crang-Svalenius, E., & Persson, E. K. (2003). Expectant first-time fathers' experiences of pregnancy. *Midwifery*, 19, 96–105.
- Glenn, N. D., & McLanahan, S. (1982). Children and marital happiness: A further specification of the relationship. *Journal of Marriage and the Family*, 44, 63–72.
- Goldstein, L. H., Diener, M. L., & Mangelsdorf, S. C. (1996). Maternal characteristics and social support across the transition to motherhood: Associations with maternal behavior. *Journal of Family Psychology*, 10, 60–71.
- Gottman, J. M., & Gottman, J. S. (2007). *And baby makes three*. New York, NY: Crown.
- Gottman, J. M., & Notarius, C. I. (2000). Decade review: Observing marital interaction. *Journal of Marriage and the Family*, 62, 927–947.
- Hackel, L. S., & Rubel, D. N. (1992). Changes in the marital relationship after the first baby is born: Predicting the impact of expectancy disconfirmation. *Journal of Personality and Social Psychology*, 62, 944–957.
- Hendrick, S. S. (1988). The Relationship Assessment Scale. *Journal of Marriage and the Family*, 50, 93–98.
- Horowitz, J. A., & Domato, E. G. (1999). Mothers' perceptions of postpartum stress and satisfaction. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 28, 595–605.
- Hunter, J. E., & Gerbing, D. W. (1982). Unidimensional measurement, second order factor analysis,

- and casual models. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 4, pp. 267–320). Greenwich, CT: JAI Press.
- Huston, T. L., & Vangelisti, A. L. (1995). How parenthood affects marriage. In M. A. Fitzpatrick & A. L. Vangelisti (Eds.), *Explaining family interactions* (pp. 147–176). Thousand Oaks, CA: Sage.
- Kerem, E., Fishman, N., & Josselson, R. (2001). The experience of empathy in everyday relationships: Cognitive and affective elements. *Journal of Social and Personal Relationships*, *18*, 709–729.
- Kluwer, E. S., & Johnson, M. D. (2007). Conflict frequency and relationship quality across the transition to parenthood. *Journal of Marriage and Family*, *69*, 1089–1106.
- Knobloch, L. K. (2007). Perceptions of turmoil within courtship: Associations with intimacy, relational uncertainty, and interference from partners. *Journal of Social and Personal Relationships*, *24*, 363–384.
- Knobloch, L. K. (2008). The content of relational uncertainty within marriage. *Journal of Social and Personal Relationships*, *2008*, 467–495.
- Knobloch, L. K., & Carpenter-Theune, K. E. (2004). Topic avoidance in developing romantic relationships: Associations with intimacy and relational uncertainty. *Communication Research*, *31*, 173–205.
- Knobloch, L. K., Miller, L. E., Bond, B. J., & Mannone, S. E. (2007). Relational uncertainty and message processing in marriage. *Communication Monographs*, *74*, 154–180.
- Knobloch, L. K., Miller, L. E., & Carpenter, K. E. (2007). Using the relational turbulence model to understand negative emotion within courtship. *Personal Relationships*, *14*, 91–112.
- Knobloch, L. K., & Solomon, D. H. (1999). Measuring the sources and content of relational uncertainty. *Communication Studies*, *50*, 261–278.
- Knobloch, L. K., & Solomon, D. H. (2002). Information-seeking beyond initial interaction: Managing relational uncertainty within close relationships. *Human Communication Research*, *28*, 243–257.
- Knobloch, L. K., Solomon, D. H., & Cruz, M. G. (2001). The role of relationship development and attachment in the experience of romantic jealousy. *Personal Relationships*, *8*, 205–224.
- Knobloch, L. K., & Theiss, J. A. (2010). An actor-partner interdependence model of relational turbulence: Cognitions and emotions. *Journal of Social and Personal Relationships*, *27*, 595–619.
- Knobloch, L. K., & Theiss, J. A. (2011). Depressive symptoms and mechanisms of relational turbulence as predictors of relationship satisfaction among returning service members. *Journal of Family Psychology*, *25*, 470–478.
- Knobloch, L. K., & Theiss, J. A. (in press). Relational turbulence during the post-deployment transition: Relational maintenance, partner responsiveness, and appraisals of turmoil. *Journal of Social and Personal Relationships*.
- Kreft, I., & de Leeuw, J. (1998). *Introducing multilevel modeling*. Thousand Oaks, CA: Sage.
- Kurdek, L. A. (1993). Nature and prediction of changes in marital quality for first-time parent and nonparent husbands and wives. *Journal of Family Psychology*, *27*, 627–626.
- Lavee, Y., Sharlin, S., & Katz, R. (1996). The effect of parenting stress on marital quality. *Journal of Family Issues*, *17*, 114–135.
- Lawrence, E., Rothman, A. D., Cobb, R. J., Rothman, M. T., & Bradbury, T. N. (2008). Marital satisfaction across the transition to parenthood. *Journal of Family Psychology*, *22*, 41–50.
- Levy-Shiff, R. (1994). Individual and contextual correlates of marital change across the transition to parenthood. *Developmental Psychology*, *30*, 591–601.
- Levi-Shiff, R., Dimitrovsky, L., Shulman, S., & Har-Even, D. (1998). Cognitive appraisals, coping strategies, and support resources as correlates of parenting and infant development. *Developmental Psychology*, *34*, 1417–1427.
- Livingston, K. R. (1980). Love as a process of reducing uncertainty: Cognitive theory. In K. S. Pope (Ed.), *On love and loving* (pp. 133–151). San Francisco, CA: Jossey-Bass.
- MacDermid, S. M., Huston, T. L., & McHale, S. M. (1990). Changes in marriage associated with the transition to parenthood: Individual differences as a function of sex-role attitudes and changes in the division of household labor. *Journal of Marriage and the Family*, *52*, 475–486.
- Moller, K., Hwang, C. P., & Wickberg, B. (2008). Couple relationship and transition to parenthood: Does workload at home matter? *Journal of Reproductive and Infant Psychology*, *26*, 57–68.
- O'Brien, M., & Peyton, V. (2002). Parenting attitudes and marital intimacy: A longitudinal analysis. *Journal of Family Psychology*, *16*, 118–127.
- Porter, C. L., & Hsu, H. C. (2003). First-time mothers' perceptions of efficacy during the transition to motherhood: Links to infant temperament. *Journal of Family Psychology*, *17*, 54–64.
- Rholes, W. S., Simpson, J. A., Campbell, L., & Grich, J. (2001). Adult attachment and the transition to parenthood. *Journal of Personality and Social Psychology*, *81*, 421–435.
- Rholes, W. S., Simpson, J. A., Kohn, J. L., Wilson, C. L., Martin, A. M., Tran, S., & Kashy, D. A. (2011). Attachment orientations and depression: A longitudinal study of new parents. *Journal of Personality and Social Psychology*, *100*, 567–586.
- Rochlen, A. B., McKelley, R. A., Suizzo, M. A., & Scaringi, V. (2008). Predictors of relationship satisfaction, psychological well-being, and life satisfaction among stay-at-home fathers. *Psychology of Men and Masculinity*, *9*, 17–28.
- Salmela-Aro, K., Aunola, K., Saiato, T., Halmesmaki, E., & Nurmi, J. E. (2006). Couples share similar changes in depressive symptoms and marital satisfaction anticipating the birth of a child. *Journal of Social and Personal Relationships*, *23*, 781–803.

- Schulz, M. S., Cowan, C. P., & Cowan, P. A. (2006). Promoting healthy beginnings: A randomized controlled trial of a preventive intervention of preserve marital quality during the transition to parenthood. *Journal of Consulting and Clinical Psychology, 74*, 20–31.
- Segrin, C., & Flora, J. (2005). *Family communication*. Mahwah, NJ: Erlbaum.
- Simpson, J. A., & Rholes, W. S. (2002). Attachment orientations, marriage, and the transition to parenthood. *Journal of Research in Personality, 36*, 622–628.
- Simpson, J. A., Rholes, W. S., Campbell, L., Wilson, C., & Tran, S. (2002). Adult attachment, the transition to parenthood, and marital well-being. In P. Noller & J. A. Feeney (Eds.), *Understanding marriage: Developments in the study of couple interaction* (pp. 385–410). Cambridge, UK: Cambridge University Press.
- Snijders, T. A. B., & Bosker, R. J. (2003). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Thousand Oaks, CA: Sage.
- Solomon, D. H., & Knobloch, L. K. (2001). Relationship uncertainty, partner interference, and intimacy within dating relationships. *Journal of Science and Personal Relationships, 18*, 804–820.
- Solomon, D. H., & Knobloch, L. K. (2004). A model of relational turbulence: The role of intimacy, relational uncertainty, and interference from partners in appraisals of irritations. *Journal of Social and Personal Relationships, 21*, 795–816.
- Solomon, D. H., & Theiss, J. A. (2008). A longitudinal test of the relational turbulence model of romantic relationship development. *Personal Relationships, 15*, 339–357.
- Solomon, D. H., Weber, K. M., & Steuber, K. R. (2010). Turbulence in relational transitions. In S. R. Wilson & S. W. Smith (Eds.), *New directions in interpersonal communication research* (pp. 115–134). Thousand Oaks, CA: Sage.
- Steuber, K. R., & Solomon, D. H. (2008). Relational uncertainty, partner interference, and infertility: A qualitative study of discourse within online forums. *Journal of Social and Personal Relationships, 25*, 831–855.
- Theiss, J. A. (2011). Modeling dyadic effects in the associations between relational uncertainty, sexual communication, and sexual satisfaction for husbands and wives. *Communication Research, 38*, 565–584.
- Theiss, J. A., & Knobloch, L. K. (2009). An actor-partner interdependence model of the experience and expression of irritations in romantic relationships. *Communication Research, 36*, 510–536.
- Theiss, J. A., & Knobloch, L. K. (in press). Relational turbulence during the post-deployment transition: Relational maintenance, partner responsiveness, and appraisals of turmoil. *Communication Research*.
- Theiss, J. A., Knobloch, L. K., Checton, M. G., & Magsamen-Conrad, K. (2009). Relationship characteristics associated with the experience of hurt in romantic relationships: A test of the relational turbulence model. *Human Communication Research, 35*, 588–615.
- Theiss, J. A., & Nagy, M. E. (2010). Actor-partner effects in the associations between relationship characteristics and reactions to marital sexual intimacy. *Journal of Social and Personal Relationships, 27*, 1089–1109.
- Theiss, J. A., & Solomon, D. H. (2006a). Coupling longitudinal data and hierarchical linear modeling to examine the antecedents and consequences of jealousy experiences in romantic relationships: A test of the relational turbulence model. *Human Communication Research, 32*, 469–503.
- Theiss, J. A., & Solomon, D. H. (2006b). A relational turbulence model of communication about irritations in romantic relationships. *Communication Research, 33*, 391–418.
- Theiss, J. A., & Solomon, D. H. (2008). Parsing the mechanisms that increase relational intimacy: The effects of uncertainty amount, open communication about uncertainty, and the reduction of uncertainty. *Human Communication Research, 34*, 625–654.
- Twenge, J. M., Campbell, W. K., & Foster, C. A. (2003). Parenthood and marital satisfaction: A meta-analytic review. *Journal of Marriage and Family, 65*, 574–583.
- Van Egeren, L. A. (2004). The development of the coparenting relationship over the transition to parenthood. *Infant Mental Health Journal, 25*, 453–477.
- Weber, K. M., & Solomon, D. H. (2008). Locating relationship and communication issues among stressors associated with breast cancer. *Health Communication, 23*, 548–559.
- Weber, K. M., & Solomon, D. H. (2010, November). *The relational turbulence model and couple decision making*. Paper presented at the annual meeting of the National Communication Association, Interpersonal Communication Divisions, San Francisco, CA.

Appendix

In the models that follow, the subscript *i* refers to the time of measurement (Level 1), the subscript *j* refers to the respondent (Level 2), and the subscript *k* refers to the couple (Level 3). Variables that are italicized are group mean-centered and variables that are capitalized are grand mean-centered.

The following equations represent the model that was constructed when amount of self uncertainty was the independent variable. Identical models were constructed for partner uncertainty, relationship uncertainty, and interference from partners when testing H1 and H2, and for the change in each independent variable when testing H3 and H4.

Model 1: The amount of relational uncertainty and partner interference as predictors of concurrent relationship satisfaction

Level 1 equation:

$$Y_{ijk} = \pi_{0jk} + \pi_{1jk}(Y_{(i-1)jk}) \\ + \pi_{2jk}(\text{self uncertainty}_{jk}) + r_{ijk}$$

Level 2 equation:

$$\pi_{0jk} = \beta_{00} + \beta_{01}(M\text{self uncertainty}_{jk}) + u_{0jk}$$

$$\pi_{1jk} = \beta_{10}$$

$$\pi_{2jk} = \beta_{20}$$

Level 3 equation:

$$\beta_{00} = \gamma_{000} + \gamma_{001}(\text{RELATIONSHIP} \\ \times \text{LENGTH}_k) + u_{00k}$$

$$\beta_{01} = \gamma_{010}$$

$$\beta_{10} = \gamma_{100}$$

$$\beta_{20} = \gamma_{200}$$

Model 2: Distinguishing between amount versus change in relational uncertainty and partner interference as predictors of relationship satisfaction

The following equations represent the model that was constructed when self uncertainty

and change in self uncertainty were the independent variables. Identical models were constructed for partner uncertainty, relationship uncertainty, and interference from partners

Level 1 equation:

$$Y_{ijk} = \pi_{0jk} + \pi_{1jk}(Y_{(i-1)jk}) \\ + \pi_{2jk}(\text{self uncertainty}_{jk}) \\ + \pi_{3jk}(-\Delta \text{ in self uncertainty}_{ijk}) + r_{ijk}$$

Level 2 equation:

$$\pi_{0jk} = \beta_{00} + \beta_{01}(M\text{self uncertainty}_{jk}) + u_{0jk}$$

$$\pi_{1jk} = \beta_{10}$$

$$\pi_{2jk} = \beta_{20}$$

$$\pi_{3jk} = \beta_{30}$$

Level 3 equation:

$$\beta_{00} = \gamma_{000} + \gamma_{001}(\text{RELATIONSHIP} \\ \times \text{LENGTH}_k) + u_{00k}$$

$$\beta_{01} = \gamma_{010}$$

$$\beta_{10} = \gamma_{100}$$

$$\beta_{20} = \gamma_{200}$$

$$\beta_{30} = \gamma_{300}$$