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Personality, Communication, and Depressive Symptoms Across the Transition to Parenthood: A Dyadic Longitudinal Investigation

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Abstract: This study adopted a person (actor) by partner perspective to examine how actor personality traits, partner personality traits, and specific actor by partner personality trait interactions predict actor's depressive symptoms across the first 2 years of the transition to parenthood. Data were collected from a large sample of new parents (both partners in each couple) 6 weeks before the birth of their first child, and then at 6, 12, 18, and 24 months postpartum. The results revealed that higher actor neuroticism and lower partner agreeableness predicted higher levels of depressive symptoms in actors. Moreover, the specific combination of high actor neuroticism and low partner agreeableness was a particularly problematic combination, which was intensified when prepartum dysfunctional problem-solving communication and aggression existed in the relationship. These results demonstrate the importance of considering certain actor by partner disposition pairings to better understand actors' emotional well-being during major life transitions. Copyright © 2015 European Association of Personality Psychology

Key words: personality; depressive symptoms; marriage; marital communication; dyads

The transition to parenthood is a stressful life event for virtually all new parents. When partners first learn of their pregnancy, they begin to anticipate and prepare for the arrival of their new baby by discussing how they will parent, arranging the baby's room, talking with other expecting parents, and learning about how their lives will change. They also start to contemplate all uncertainties that accompany becoming a new parent (e.g. uncertainty about the childbirth process, what their child will be like, and how well they will parent). After the baby is born, couples must then rapidly shift from anticipating and preparing for parenting to actually engaging in parenting tasks while also juggling the other important areas of their life.

Most prior research indicates that the transition to parenthood has deleterious effects on both relationships (e.g. Belsky, Lang, & Rovine, 1985; Belsky & Pensky, 1988; Belsky, Spanier, & Rovine, 1983; Cowan & Cowan, 1988, 1995, 2000; Lawrence, Rothman, Cobb, Rothman, & Bradbury, 2008; Twenge, Campbell, & Foster, 2008) and individual well-being (such as depressive symptoms; e.g. Cowan & Cowan, 1995; Feeney, Alexander, Noller, & Hohaus, 2003; O'Hara & Swain, 1996; Parade, Blankson, Leerkes, Crockenberg, & Faldowski, 2014; Simpson, Rholes, Campbell, Tran, & Wilson, 2003). Not all relationship partners, however, experience the transition in the same way. Recent research has identified some of the key personal and environmental factors—particularly the prepartum factors—that forecast marital satisfaction (e.g. Belsky & Rovine, 1990; Kohn et al., 2012) and depressive symptoms (e.g. O'Hara & Swain, 1996; Parade et al., 2014; Rholes et al., 2011; Simpson et al., 2003) across the transition to parenthood. Belsky and Rovine (1990) and Cowan and Cowan (1995), for example, emphasized the importance of prepartum factors (rather than those following the baby's birth) in attempting to understand how each partner in a relationship uniquely experiences the transition. Extending these findings, the current longitudinal study of first-time parents investigates how certain *prepartum* personality traits of each partner predict depressive symptoms experienced across the transition by adopting a dyadic, person-by-situation perspective.

Personality and depressive symptoms

According to many personality psychologists, personality traits are captured by five higher order dimensions—neuroticism, agreeableness, extraversion, openness to experience, and conscientiousness—collectively known as the Big 5 (Digman & Takemoto-Chock, 1981; Norman, 1963). Individuals who score high on neuroticism are dispositionally anxious, tense, unstable, sensitive, prone to worry, hostile, impulsive, and tend to experience negative affect. Highly agreeable individuals are trusting, sympathetic, warm, praising, gentle, altruistic, unselfish, forgiving, affectionate, and cooperative. Highly extraverted individuals are sociable, outspoken, energetic, active, adventurous,

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outgoing, lively, and experience positive emotions. Highly open individuals are imaginative and sensitive to art and beauty, intellectually curious and intelligent, resourceful, and behaviourally flexible. And those who score high on conscientiousness are trustworthy, well organized, cautious, responsible, efficient, and diligent (see Costa & McCrae, 1985, 1992; John & Srivastava, 1999, for more information on each trait).

Among the Big 5, neuroticism is the strongest predictor of clinical depression (e.g. Kotov, Gamez, Schmidt, & Watson, 2010) and depressive symptoms (e.g. Chioqueta & Stiles, 2005). Two mechanisms account for this strong association. First, highly neurotic individuals tend to report and/or experience more stress in their daily lives (e.g. Bolger & Zuckerman, 1995; Gunthert, Armeli, & Cohen, 1999; Hammen, 2006; Hutchinson & Williams, 2007; Kendler, Kuhn, & Prescott, 2004; Ormel & Wohlfarth, 1991; Van Os & Jones, 1999). Gunthert and colleagues (1999), for example, examined different types of stressors and found that highly neurotic individuals report experiencing more *interpersonal* stressors on a daily basis (rather than stressors associated with academic, work, fatigue, illness, etc.) than less neurotic individuals do. One possible reason for this is highly neurotic individuals' tendency to have negative interactions with other people, especially their romantic partners. Other research has found that highly neurotic individuals are relatively more likely to engage in negative communication patterns (e.g. Caughlin, Huston, & Houts, 2000; Donnellan, Assad, Robins, & Conger, 2007; Donnellan, Conger, & Bryant, 2004; Donnellan, Larsen-Rife, & Conger, 2005), poorer emotional regulation (e.g. aggressive and externalization; Vater & Schröder-Abé, 2015), display dysfunctional conflict styles (Hanzal & Segrin, 2009), and occasionally become violent or aggressive (e.g. Hellmuth & McNulty, 2008) with their romantic partners.

Second, when confronted with a stressor, highly neurotic individuals often react more intensely than less neurotic individuals, reporting higher levels of distress (e.g. Gunthert et al., 1999), poorer mental health (e.g. Van Os & Jones, 1999), greater anger (e.g. Bolger & Zuckerman, 1995), and more depressive symptoms (e.g. Bolger & Zuckerman, 1995; Hutchinson & Williams, 2007). Neuroticism, therefore, is particularly important for predicting and understanding individuals' psychological reactions to stressful events. As a result, highly neurotic individuals should be more vulnerable to experiencing adverse depressive symptoms during chronically stressful life transitions.

Surprisingly, little research has investigated neuroticism and its ties to depressive symptoms in the context of the transition to parenthood, which is one of the most common and difficult life transitions experienced by most adults (Cowan & Cowan, 2000). A large body of research has focused on postpartum depression, which is a clinically defined specific depressive episode following childbirth (see the *Diagnostic and Statistical Manual of Mental Disorders*; American Psychiatric Association, 2000, 2013). This work indicates that neuroticism predicts more postpartum depressive problems during the first few months after childbirth (e.g. Areias, Kumar, Barros, & Figueredo, 1996; Dudley, Roy, Kelk, & Bernard, 2001; O'Hara & Swain, 1996; Robertson, Grace, Wallington, & Stewart, 2004; Verkerk, Denollet, Van Heck, Van Son, & Pop, 2005). This research, however, is limited because the definition of postpartum depression usually excludes depressive symptoms, which are experienced by a much higher percentage of new parents and lie on the low-to-middle part of the unipolar depression continuum (O'Hara & Swain, 1996). In addition, nearly all prior postpartum depression research has focused on mothers, with remarkably little considering fathers. Additionally, prior research has not investigated prepartum depression or depressive symptoms, which also is an important time during the transition to parenthood. In fact, to our knowledge, only one study (Matthey, Barnett, Ungerer, & Waters, 2000) has examined the association between neuroticism and depressive symptoms across the transition to parenthood using rigorous methods (i.e. assessing both partners and their depressive symptoms longitudinally, both before and after childbirth). Matthey and colleagues found that higher neuroticism predicted more depressive symptoms measured at four time points (prepartum, and then 6, 18, and 52 weeks postpartum).

Partner personality trait effects

The prior section explores how an *individual's* personality can affect depressive symptoms, particularly in stressful life events (e.g. the transition to parenthood). However, relationship theorists (e.g. Holmes, 2002; Reis, Collins, & Bersheid, 2000; Zayas, Shoda, & Ayduk, 2002) have argued that too much research aiming to understand individuals' reaction to certain situations, has ignored a crucial and salient aspect of the environment context—the *relationship* or *interpersonal* context. According to this perspective, individual outcomes (or behaviours) can be attributable to the interaction between an individual's characteristics and the relationship context (i.e. the *relationship partner's* characteristics).

Within the study of romantic relationships, a growing body of research is beginning to focus on between-person effects (i.e. partner effects), which reflect the influence that a *partner's* dispositions or actions have on an individual's (i.e. the actor's) responses (or outcomes). Partner effects supplement commonly studied within-person effects (actor effects) (see path b and path a, respectively, in Figure 1). (For relevant personality examples, see Dyrenforth, Kashy, Donnellan, & Lucus, 2010; Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010; Robins, Caspi, & Moffitt, 2000; and Schaffhuser, Allemand, & Martin, 2014.) Thus, the typically studied actor effects are only part of the 'puzzle', and important insight about an individual's response to a given

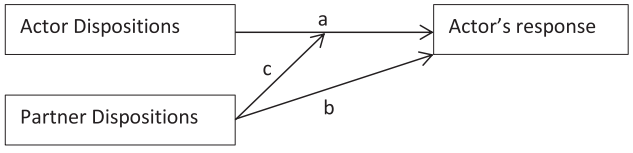

Figure 1. A dyadic model depicting within-person (actor) disposition effects (path a), between-person (partner) disposition effects (path b), and actor by person (partner) disposition effects (path c), predicting actor's response to a situation.

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situation can be gained by taking a dyadic perspective. Despite this growing trend, fairly little is known about whether and how a partner's personality traits affect an actor's well-being, particularly his or her level of depressive symptoms across a chronically stressful life transition.

Of the Big 5 traits, neuroticism and agreeableness ought to be most relevant when considering possible partner personality trait effects on actor well-being, especially during the transition to parenthood. As discussed earlier, highly neurotic individuals experience more stressors (particularly interpersonal stressors) and respond to them more intensely, which should have a significant impact on their romantic partners. We identified only one study that has examined partner neuroticism effects on well-being. Ruiz, Matthews, Scheier, and Schulz (2006) investigated male patients and their spouses (caregivers) before and after coronary artery bypass surgery. Higher caregiver pre-surgery neuroticism predicted more post-surgery patient depressive symptoms, and vice versa. Thus, there is some evidence that partner neuroticism is related to an individual's psychological reactions to a stressful situation, but these findings are confined to a specific patient population in a specific health context.

Agreeableness is associated with the motivation to maintain positive relationships, and it predicts behaviour during interpersonal conflicts (Graziano, Jensen-Campbell, & Hair, 1996). Individuals who score low on agreeableness are less motivated to maintain good, harmonious relationships and instead strive to further their own personal goals and interests, even at the expense of their romantic partners and relationships. Accordingly, disagreeable people (those scoring low on agreeableness) tend to have more antisocial personalities as revealed by their higher levels of delinquency (e.g. Jones, Miller, & Lynam, 2011; Robins, John, & Caspi, 1994), greater anger and frustration (e.g. Ahadi & Rothbart, 1994), and heightened aggression (e.g. Gleason, Jensen-Campbell, & Richardson, 2004; Jones et al., 2011). Lower agreeableness is also systematically related to behaviour in conflict situations with romantic partners, especially the conflict strategies that are displayed and responses to them (e.g. Cote & Moskowitz, 1998; Graziano et al., 1996; Jensen-Campbell & Graziano, 2001; Suls, Martin, & David, 1998; Vater & Schröder-Abé, 2015; van de Vliert & Euwema, 1994). Within romantic relationships, for instance, less agreeable people report and enact more negative behaviours such as poorer communication and greater hostility (Donnellan et al., 2004). Thus, a partner's level of agreeableness should have an effect on an actor's well-being given the tendency of less agreeable partners to elicit and/or evoke negative interactions during relationship conflict.

We suggest that during the transition to parenthood—a time known to fuel marital conflict (e.g. Belsky & Pensky, 1988)—partner agreeableness should be a more robust predictor of actor well-being than partner neuroticism. Although neurotic individuals are prone to experiencing negative affect, less agreeable individuals lack the motivation to maintain positive, constructive relationships. Consequently, highly neurotic partners should be less likely than less agreeable partners to engage in persistent, hostile, or spiteful and vindictive interpersonal exchanges that escalate conflicts and elevate (or sustain) actors' depressive symptoms. To our knowledge, no study to date has examined partner agreeableness and its possible ties to actor well-being across a chronically stressful life transition.

Partner by actor personality trait effects

Despite considering both actor and partner effects to explain an individual's response to a given situation, we are still missing a critical component—possible *interactions* between the specific dispositions of actors and their partners (see path c in Figure 1). Although prior research has found that similarity in personality trait scores predicts greater attraction (Cuperman & Ickes, 2009) and marital satisfaction (e.g. Gonzaga, Campos, & Bradbury, 2007; Robins et al., 2000), no studies have examined actor dispositions (within-person effects), partner dispositions (between-person effects), and actor by partner disposition interactions during a major life event such as the transition to parenthood. Moreover, no research to our knowledge has investigated actor/partner interactions between two different personality traits.

On the basis of prior research examining neuroticism and agreeableness, one might anticipate an interaction between an actor's level of neuroticism and his or her partner's level of agreeableness predicting the actor's depressive symptoms over a chronically stressful life event such as the transition to parenthood, which often entails frequent and sometimes intense interpersonal conflicts.

To illustrate this point, imagine Owen and Christina, who are expecting their first child. Owen is highly neurotic and very stressed as he plans for (and eventually faces) the many new responsibilities of fatherhood. This makes him vulnerable to elevated and persistent depressive symptoms. Christina, on the other hand, is low on trait agreeableness. She does not trust Owen, has little empathy for him, and is uncooperative and quarrelsome (cf. Costa & McCrae, 1985, 1992; Cote & Moskowitz, 1998) when they discuss parenting issues. She also uses more destructive conflict strategies (e.g. van de Vliert & Euwema, 1994), is aggressive (e.g. Jones et al., 2011), and displays poor communication tactics (e.g. Donnellan et al., 2004). Given his neuroticism, Owen reinforces Christina's tendencies by engaging in similar behaviours when the two have heated discussions (e.g. Caughlin et al., 2000; Donnellan et al., 2004, 2005, 2007; Hanzal & Segrin, 2009). Owen perceives their constant arguments as very stressful, which sustains his already high depressive symptoms. But what if his partner was highly agreeable? She would engage in more positive conflict strategies, and Owen should, therefore, feel less interpersonal stress and fewer depressive symptoms as a result.

Now, consider another expecting couple, Jackson and April. Jackson is less neurotic and not prone to experiencing negative affect, even during chronically stressful situations (e.g. Bolger & Zuckerman, 1995; Gunthert et al., 1999; Hutchinson & Williams, 2007; Kendler et al., 2004; Van Os & Jones, 1999). Thus, despite experiencing the same stressors along with the fact that his partner (April) is low on trait agreeableness, this actor/partner personality trait 'combination' should not negatively impact Jackson's depressive symptoms across the transition.

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Partner personality trait by actor personality trait by relationship context effects

Thus far, we have proposed that in order to predict an individual's outcome (depressive symptoms) in a specific situation (the transition to parenthood) accurately, one must assess specific actor traits (e.g. neuroticism), specific partner traits (e.g. agreeableness), and theoretically relevant actor by partner disposition effects (e.g. actor neuroticism by partner agreeableness). However, it is also important to consider the type of *behaviours* enacted by both partners within the relationship.

We suggest that the *combination* of a highly neurotic individual (actor) and a disagreeable (or less agreeable) partner should result in the individual (actor) experiencing more depressive symptoms across the transition to parenthood, especially if such couples enter the transition to parenthood reporting more negative prepartum interactions (e.g. more aggression/hostility and more destructive conflict strategies). More specifically, aggression or dysfunctional prepartum communication patterns (such as expressing hostility or aggression, being unable to solve problems, and lacking empathy and support; e.g. Gill, Christensen, & Fincham, 1999; Gottman & Krokoff, 1989; Lawrence & Bradbury, 2001; Rogge & Bradbury, 1999). As aptly stated by Cowan and Cowan (1995), "A baby's arrival is unlikely to destroy very well-functioning marriages *or* generate closer, more satisfying relationships between already troubled partners" (p. 415). Thus, when highly neurotic individuals are involved with less agreeable partners *and* the couple also has an established pattern of engaging in more negative prepartum communication, individuals (actors) should experience the *highest* levels of depressive symptoms.

The current study

The current longitudinal study tests and extends our knowledge of the *prepartum* predictors (assessed before the child's birth) of depressive symptoms over the transition to parenthood by determining whether and how certain prepartum personality traits of each relationship partner forecast depressive symptoms across the first 2 years of the transition. The study had a five-wave longitudinal design, with the first assessment taking place approximately 6 weeks before the birth of each couple's first child and with postpartum assessments at approximately 6, 12, 18, and 24 months after birth.

For each of the hypotheses listed herein, the prepartum actor, partner, and actor by partner personality trait effects on depressive symptoms could either (i) change across the transition (from 6 weeks before birth to 24 months postpartum) or (ii) remain stable. If the postpartum period is significantly more stressful than the prepartum period, one might anticipate that prepartum actor, partner, and actor by partner personality traits (particularly neuroticism) would be associated with *increases* in depressive symptoms over time. However, as discussed earlier, the transition to parenthood usually begins as soon as most couples discover the pregnancy. In addition, our prepartum assessment occurred just 6 weeks before the due date, a period when all couples are actively preparing for the arrival of their baby and are having important parenting discussions. Even though the stressors that couples face during the prepartum and postpartum phases are different, one phase is not likely to be more or less stressful, particularly for a person who is highly neurotic. Given this fact, we anticipated that associations between actor, partner, and actor by partner personality trait interactions on actors' depressive symptoms should remain fairly stable across the transition. However, we tested for possible linear changes in depressive symptoms across time.

Prior transition studies have found few personality traits by gender effects predicting personal well-being over time. Although there is no reason to expect that personality traits would interact with gender roles during the transition, we also tested for possible gender moderation effects.

We tested the following five hypotheses:

Personality trait hypotheses

Hypothesis 1: The amount of depressive symptoms reported by individuals (actors) should be related to individuals' (actors') prepartum levels of neuroticism (assessed before childbirth). Specifically, individuals who score higher on neuroticism at the prepartum period should report more depressive symptoms compared with their less neurotic counterparts.

Hypothesis 2: The romantic partner's prepartum personality traits should also be related to individuals' (actors') depressive symptoms. Specifically, individuals involved with partners who are less agreeable (assessed before childbirth) should report more depressive symptoms than those involved with partners who are more agreeable.

Hypothesis 3: The *combination* of higher prepartum actor neuroticism and lower prepartum partner agreeableness should predict the most depressive symptoms in actors. Specifically, highly neurotic individuals (actors) involved with less agreeable partners should report particularly high depressive symptoms.

Personality trait by relationship hypotheses

Hypothesis 4: When prepartum communication is poor due to poor problem solving (Hypothesis 4a) or negative affect (e.g. lack of empathy or support) (Hypothesis 4b) in the relationship, highly neurotic individuals (actors) involved with less agreeable partners should report even more depressive symptoms compared with highly neurotic individuals who have more agreeable partners.

Hypothesis 5: When prepartum aggression is higher in the relationship, highly neurotic individuals (actors) involved with less agreeable partners should report even more depressive symptoms than highly neurotic individuals who have more agreeable partners.

METHODS

Participants

We recruited 192 couples (at Time 1), all of whom were living together in a southwestern US city and expecting their first child. Couples were recruited from childbirth classes at a local hospital. Approximately 45% of those approached agreed to

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participate. There were 165 couples at Time 2, 153 couples at Time 3, 151 couples at Time 4, and 137 couples at Time 5 (24 months after childbirth). Fifty-five couples dropped out sometime during the study.

Independent-sample *t*-tests were conducted on the Time 1 variables to determine whether participants who completed the study differed from those who did not, regardless of when they dropped out. As reported in Rholes et al. (2011), participant dropouts reported significantly more negative exchanges and were together (married or involved) for less time, were younger, less educated, and had lower household incomes than participants who completed the entire study. Importantly, the groups did not differ on depression symptoms (see Table 3 in Rholes et al., 2011). In addition, they did not differ on the Marital Satisfaction Inventory (MSI) communication subscales [affective communication, $t(158) = -0.35$, $p = .73$; problem-solving communication, $t(382) = -0.81$, $p = .42$] or the personality measures [neuroticism, $t(382) = -0.20$, $p = .84$; agreeableness $t(382) = -0.36$, $p = .72$]. They did, however, report more aggression in the relationship [$t(382) = -2.34$, $p = .02$].

Most of the participants were Caucasian (82%, with the remaining 9% Asian and 9% Hispanic), and all but 6% had at least some college education. Household income was moderate: 16% of the sample had an annual household income under $25 000, 46% earned $25 000–$55 000 per year, 38% earned more than $55 000 but less than $100 000, and 6% earned over $100 000. At Time 1, the mean ages of women and men were 26.7 ($SD = 4.1$) and 28.4 ($SD = 4.4$) years, respectively. Only 5% of couples at Time 1 were living together but not married. Unmarried couples had been cohabiting for a mean of 1.85 years ($SD = 2.2$). Married couples had been married for a mean of 3.3 years ($SD = 2.6$). For additional sample information, see Rholes et al. (2011).

Procedures

Study inclusion criteria required participants to be (i) married or living together with their romantic partner, and (ii) expecting their first child together. Each partner was privately mailed self-report measures approximately 6 weeks prior to their expected due date (Time 1). Postpartum measures were privately mailed to each partner at approximately 6 (Time 2), 12 (Time 3), 18 (Time 4), and 24 months (Time 5) following childbirth. Partners were instructed to complete their questionnaires *privately and independently* (i.e. they were not to talk to or consult with their partners) and to return them in separate, pre-paid mail envelopes. Participants were given cash rewards for each completed questionnaire, and couples entered a random drawing for completing all five phases (see Rholes et al., 2011).

Measures

Because we were interested in prepartum predictors of depressive symptoms, we examined how predictors (personality and relationship variables) assessed at Time 1 predicted the outcome measure (depressive symptoms), which was measured at all five assessment waves. Cronbach alphas for each measure are presented in Table 1.

Personality traits: neuroticism and agreeableness (Time 1)
The appropriate subscales from a 35-item version of the 44-item Big Five Inventory (John, Donahue, & Kentle, 1991; John & Srivastava, 1999) assessed the degree of neuroticism (seven items; e.g. 'I get nervous easily') and agreeableness (seven items; e.g. 'I like to cooperate with others') reported by each individual. All items were answered on 5-point scales, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Table 1. Means, standard deviations, Cohen's *d* effect size, and within-dyad correlations for prepartum predictors and depressive symptoms (over time)

	Men		Women			
Variable	α	*M* (*SD*)	α	*M* (*SD*)	*d*	*r*
Depressive symptoms						
Prepartum	.88	7.78 (7.54)	.88	13.36 (8.35)	−0.70	.21**
6 months	.88	7.94 (7.32)	.91	9.63 (8.86)	−0.20	.26**
12 months	.91	8.72 (8.26)	.90	9.84 (8.68)	−0.13	.21*
18 months	.91	8.34 (8.21)	.92	11.11 (10.20)	−0.30	.25**
24 months	.92	8.33 (8.83)	.90	10.44 (9.07)	−0.24	.20*
Prepartum predictors						
Neuroticism	.79	2.23 (0.67)	.84	2.83 (0.80)	−0.81	.03
Agreeableness	.68	3.79 (0.56)	.70	3.80 (0.59)	−0.01	.11
Problem-solving communication	.88	5.74 (4.73)	.86	4.51 (4.10)	0.28	.52***
Affective communication	.83	1.73 (1.89)	.68	2.41 (2.68)	−0.29	.43***
Aggression	.77	1.74 (2.05)	.78	1.31 (1.85)	0.22	.39***

Note: Cohen's *d* reflects the magnitude of the differences between men's and women's means for the prepartum predictors and depressive symptoms over time. Pearson *r*s are within-dyad correlations between measures collected from each relationship partner (e.g. the correlation between each husband's and wife's prepartum depressive symptoms). Radloff (1991) administered the same measure (Center for Epidemiological Studies–Depression Scale) to an adult general population sample ($n = 2440$) and $M = 8.97$ ($SD = 8.50$).
*$p < .05$.**$p < .01$.***$p < .001$.

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Communication and aggression (Time 1)
The quality/level of communication (problem-solving and affective communication) and aggression in each relationship reported by each partner was assessed using subscales from the MSI-Revised (MSI-R; Snyder, 1997; Snyder & Aikman, 1999). The subscales were affective communication (13 items; e.g. 'It is sometimes easier to confide in a friend than my partner'), problem-solving communication (19 items; e.g. 'There are just some things my partner and I just can't talk about'), and aggression (10 items; e.g. 'My partner has slammed things around or thrown things in anger'). All items were answered using a *true* (=1)–*false* (=0) format.

Depressive symptoms (Times 1–5)
The Center for Epidemiological Studies–Depression Scale, developed for use in nonclinical populations, assessed the frequency of depressive symptoms during the past week (Radloff, 1977). This 20-item scale contains items such as 'I felt that everything I did was an effort' and 'I was bothered by things that usually don't bother me'. All items were answered on 4-point scales, ranging from 0 (*rarely or none of the time* [*less than 1 day*]) to 3 (*most or all of the time* [*5–7 days*]).

Data structure

Dyadic growth curve models were tested using multilevel modelling (Kashy & Donnellan, 2008). Dyadic interdependence was modelled in three ways: (i) as similarity on the outcome at birth (by including a correlation between spouses' intercepts); (ii) as unique similarity at the specific time points (by including a correlation between spouses' time-specific residuals); and (iii) as similarity in trajectory by including a correlation between spouses' slopes for time. Data were also structured for analysis using the actor–partner interdependence model (Kashy & Kenny, 2000; Kenny, 1996).

For the growth curve models, time-zero was defined as the date of childbirth, and it was scored in months since childbirth. To account for the variation in the exact timing of each assessment, we computed months relative to childbirth based on when each participant completed each questionnaire (see Kohn et al., 2012). Given the way Time was centred, the intercept reflects depressive symptoms at childbirth, and the slope for Time represents the degree to which symptoms changed each month. All continuous predictor variables were centred on the grand mean (Aiken & West, 1991), and gender was coded −1 for women and 1 for men.

Data analytic models

We first ran a base model that examined linear changes in depressive symptoms over time and possible gender differences (by including the main effect for gender and its higher order interaction with time[1]). For the first three hypotheses, a moderated growth model was used to test for main effects and linear changes in actors' depressive symptoms across the transition to parenthood (assessed at five waves), potentially moderated by each actor's and/or his or her partner's prepartum levels of neuroticism and agreeableness. The model included fixed effects for gender and for both hypothesized personality traits. In addition to the main effects, all 2-way and 3-way interactions were also included in these models, culminating in six 4-way interactions involving gender, time, and actor/partner neuroticism and agreeableness. Although we did not anticipate either changes across time or gender differences, we tested for them because, to our knowledge, this is the first study to examine personality interactions over the transition to parenthood.

To ensure the personality findings were not attributable to variance they might share with prepartum attachment orientations or partner depressive symptoms, the personality model was re-run with attachment anxiety (actor and partner), attachment avoidance (actor and partner), and partner depressive symptoms included as fixed effects (see the APPENDIX for results). In addition, a model containing all actor and partner Big 5 personality traits and all possible actor by actor personality and actor by partner personality combinations was also conducted to test whether the hypothesized actor neuroticism by partner disagreeableness interaction (the primary hypothesis of the study) was the primary interaction found (see the APPENDIX for results).

For Hypotheses 4a, 4b, and 5, all significant agreeableness and neuroticism main effects and interactions (as well as the main effects and interactions leading up to the significant interactions) in the prior model were also included in these models.[2] Also included were each hypothesized relationship moderator (i.e. actor and partner problem-solving communication, affective communication, and aggression scores) and the relevant interactions (involving actor neuroticism, partner agreeableness, a relationship moderator, time, and gender), culminating in four potential 4-way interactions. No interactions beyond four ways were included because of the difficulties of interpreting the patterns. All significant interactions reported later are graphed using 1 *SD* above and 1 *SD* below the grand mean as high and low values for each continuously distributed predictor (Aiken & West, 1991).

RESULTS

Table 1 presents means and standard deviations (reported separately for women and men) and Cohen's *d* each of the variables assessed at Time 1 and for depressive symptoms (which was assessed prepartum, and then at 6, 12, 18, and 24 months postpartum). Table 1 also shows the correlations between husbands and wives on each variable. As expected, husbands' and wives' depressive symptoms were correlated at each assessment wave, as were most of their Time 1

[1]Given that quadratic effects are higher order interactions (in comparison with linear effects), there is typically less power to estimate such effects, which are consequently less stable. Because of this and because we had no theoretical reason to expect any quadratic moderation effects, we only examined *linear* effects of time.

[2]The personality and relationship context models were run with all variables in the personality-only model (as opposed to only the significant terms and those building to the significant terms). The results remained the same.

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Table 2. Correlations for variables at Time 1 for men and women

Variable	1	2	3	4	5	6
1. Depressive symptoms	—	.38***	−.18*	.20**	.27***	.06
2. Neuroticism	.42***	—	−.36***	.30***	.27***	.12
3. Agreeableness	−.19*	−.36***	—	−.30***	−.20**	−.11
4. Problem-solving communication	.28***	.21**	−.14	—	.64***	.48***
5. Affective communication	.42***	.31***	−.09	.61***	—	.37***
6. Aggression	.10	.21***	−.13	.35***	.28***	—

Note: Correlations among the variables for men appear below the diagonal; those for women appear above the diagonal.
*$p < .05$.**$p < .01$.***$p < .001$.

predictor variables (excluding neuroticism and agreeableness), revealing non-independence between relationship partners. This covariation was controlled for in the multilevel models. Table 2 presents correlations between the variables, separately for each gender.

Base model

The base model tested for linear changes in depressive symptoms over time and possible gender differences (see Table 3). As reported by Rholes et al. (2011), depressive symptoms remained stable on average across the transition. This finding is consistent with other research (e.g. Matthey et al., 2000) and with our hypothesis. A significant gender difference emerged. Women reported higher depressive symptoms than men on average. A significant interaction between time and gender was also found. It revealed that women's depressive symptoms decreased across the transition, $b = -0.08$, $p = .004$, whereas men's remained stable, $b = 0.04$, $p = .15$.

The variance components (random effects) are shown in Table 3. There was significant variability in men's and women's residuals (unexplained variance), and the residuals between partners were significantly and positively correlated. There also was significant variability in men's and women's intercepts, and the covariance between partners' intercepts was also significant (indicating a significant positive correlation between partners' intercepts, $r = .39$). Finally, even though the variability in women's slopes was not significant and the covariance between partners' slopes was not significant (indicating no correlation between partners' slopes, $r = .05$), the variability in men's slopes was significant.

Table 3. Gender differences in changes in depression for the base model

	b/Var (*SE*)	*t*/Wald *Z*
Fixed effects		
Intercept	10.00 (0.42)	23.57***
Gender	−2.03 (0.32)	−6.29***
Time	−0.02 (0.02)	−1.03
Gender × time	0.06 (0.02)	3.25**
Variance components		
Residuals		
Women	41.61 (2.49)	16.69***
Men	26.10 (1.71)	15.29***
Covariance (CSH rho)	0.09 (0.04)	2.00*
Intercept		
Women	34.79 (5.30)	6.57***
Men	30.17 (4.47)	6.74***
Covariance	12.65 (3.59)	3.53***
Slope		
Women	0.02 (0.01)	1.62
Men	0.05 (0.01)	3.90***
Covariance	0.00 (0.01)	0.50

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

Personality trait model

The first growth curve model predicting actors' depressive symptoms treated gender, time, actor and partner neuroticism, and actor and partner agreeableness as predictor variables. These models also included all of the basic interaction effects (see Table 4). As shown in the actor column of Table 3, the significant main effect for gender and the gender by time interaction remained significant.

Actor personality traits (Hypothesis 1)

Consistent with Hypothesis 1, there was a main effect for actor neuroticism, such that more neurotic actors reported more depressive symptoms at their baby's birth (see the actor column in Table 4). The 4-way interaction (an interaction entered as a control variable and was not hypothesized) between gender, time, actor neuroticism, and actor agreeableness was also significant (see the actor by actor column in Table 4).[3]

Partner personality traits (Hypothesis 2)

As reported in the partner column in Table 4 and consistent with Hypothesis 2, a main effect emerged for partner

[3]Women and men who scored lower on neuroticism and higher on agreeableness had stable depressive symptoms over time, $b = -0.02$, $p = .79$; $b = 0.06$, $p = .24$, respectively. Further, men and women who scored higher on neuroticism and lower on agreeableness also had stable depressive symptoms over time, $b = -0.08$, $p = .36$; $b = -0.03$, $p = .48$, respectively. However, for men who scored higher on neuroticism and higher on agreeableness, depressive symptoms increased over time, $b = 0.20$, $p = .05$. Depressive symptoms for women who scored higher on neuroticism and higher on agreeableness ecreased over time, $b = -0.17$, $p = .03$. Finally, depressive symptoms for men lower on neuroticism and lower on agreeableness increased over time $b = 0.20$, $p = .01$, whereas for women who had these same trait levels, depressive symptoms remained stable, $b = -0.03$, $p = .76$.

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Table 4. Depressive symptoms as a function of actors' and partners' neuroticism and agreeableness

Fixed effects	Actor	Partner	Actor × actor	Partner × partner	Actor × partner	Partner × actor
Intercept	9.23***					
Gender	−1.28**					
Time	0.02					
Gender × time	0.08**					
Neuroticism	3.63***	0.47				
Gender × neuroticism	−0.40	0.94				
Time × neuroticism	−0.05	0.03				
Gender × time × neuroticism	0.00	−0.05				
Agreeableness	−1.44	−1.71*				
Gender × agreeableness	0.39	−1.03				
Time × agreeableness	0.00	0.08				
Gender × time × agreeableness	0.06	−0.04				
Neuroticism × agreeableness			−0.78	0.15	−3.27**	−1.55
Neuroticism × neuroticism					0.14	
Agreeableness × agreeableness					−0.76	
Gender × neuroticism × agreeableness			−0.92	−0.87	−0.04	0.74
Gender × neuroticism × neuroticism					−0.12	
Gender × agreeableness × agreeableness					−0.05	
Time × neuroticism × agreeableness			0.08	0.11*	−0.02	−0.03
Time × neuroticism × neuroticism					−0.04	
Time × agreeableness × agreeableness					−0.09	
Gender × time × neuroticism × agreeableness			0.16**	−0.01	0.06	0.12
Gender × time × neuroticism × neuroticism					0.11*	
Gender × time × agreeableness × agreeableness					0.10	

Note: For gender, 1 = men, −1 = women. The actor/partner columns correspond to the order of the fixed effects. For example, for the interaction *Neuroticism* × *Agreeableness*, the *Actor* × *Actor* column refers to actor neuroticism and actor agreeableness, whereas the *Actor* × *Partner* column refers to actor neuroticism and partner agreeableness.*$p < .05$.**$p < .01$.***$p < .001$.

agreeableness. Specifically, less partner agreeableness predicted more actor depressive symptoms at the baby's birth, and a main effect for partner neuroticism was not found. In addition, a significant 3-way interaction emerged between time, partner neuroticism, and partner agreeableness (see the partner by partner column in Table 4).[4]

Actor by partner personality trait interactions (Hypothesis 3)

Among the actor by partner interaction terms, only the predicted 2-way interaction between actor neuroticism and partner agreeableness was significant (see the actor by partner column in Table 4 and Figure 2). Specifically, more neurotic actors reported significantly fewer depressive symptoms at the baby's birth if their partners were more agreeable relative to actors who had more disagreeable partners, $b = -4.31$, $p < .001$. However, less neurotic actors did not report different depressive symptom levels in response to their partner's level of agreeableness, $b = 0.89$, $p = .41$. A significant 4-way interaction (which was not hypothesized) emerged between gender, time, actor neuroticism, and partner neuroticism (see the actor by partner column in Table 4).[5]

Personality trait and relationship moderator models

Building on the personality models, the personality and relationship moderator models included the significant neuroticism and agreeable effects discussed earlier along with the prepartum MSI relationship moderators reported by both partners (i.e. actor and partner reports of problem-solving communication, affective communication, and aggression). These actor and partner variables were included because neuroticism and agreeableness are both associated with poorer communication and greater aggression, and no a priori predictions were made regarding whether the actor's or the partner's reported levels would moderate actors' depressive symptom outcomes. Each relationship moderator was tested in a separate model. All possible interactions with each relationship moderator, time, gender, and the significant

[4]Individuals involved with partners who were higher on neuroticism and higher on agreeableness experienced increasing depressive symptoms across time, $b = 0.14$, $p = .04$. Individuals involved with partners who were higher on neuroticism and lower on agreeableness had stable depressive symptoms over time, $b = -0.06$, $p = .28$. Those involved with partners who were either lower on neuroticism and lower on agreeableness or lower on neuroticism and higher on agreeableness remained stable over time, $b = -0.01$, $p = .92$; $b = -0.01$, $p = .73$, respectively.

[5]Depressive symptoms for both men and women who scored higher on neuroticism and had highly neurotic partners did not change over time, $b = 0.09$, $p = .21$; $b = -0.13$, $p = .09$, respectively. Furthermore, depressive symptoms did not change across time for men and women who were lower on neuroticism and had partners higher on neuroticism, $b = 0.07$, $p = .11$; $b = 0.14$, $p = .25$, respectively. The same was true for men and women higher on neuroticism who had partners lower on neuroticism, $b = 0.03$, $p = .79$; $b = -0.08$, $p = .09$, respectively. Men's depressive symptoms increased across the transition if they and their partners scored lower on neuroticism, $b = 0.19$, $p = .01$, whereas women's depressive symptoms decreased, $b = -0.18$, $p = .02$.

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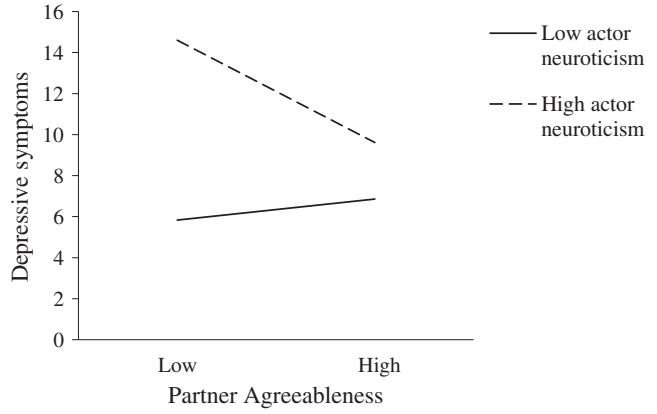

Figure 2. Depressive symptoms moderated by actors' neuroticism and partners' agreeableness.

personality trait factors (actor neuroticism and partner agreeableness) were also included in these models.

In each personality trait–relationship moderation model, the fixed effects (gender and actor neuroticism) and the interactions [gender by time, actor neuroticism by partner agreeableness, time by partner neuroticism by partner agreeableness (except in the affective communication model), and gender by time by actor neuroticism by actor agreeableness] all remained significant. The fixed effect for partner agreeableness also remained significant in the affective communication model. The interaction between gender, time, actor neuroticism, and partner neuroticism was not significant for any of the models except for the one that included aggression. The specific findings related to Hypotheses 4a–5 (i.e. the 3-way and 4-way interactions involving each relationship moderator, actor neuroticism, and partner agreeableness) are discussed below.

Problem-solving communication (Hypothesis 4a)

As shown in Table 5 (see the partner by actor by partner column), the analyses revealed a significant 3-way interaction between actor neuroticism, partner agreeableness, and partner problem solving (see Figure 3). Specifically, when partners reported greater prepartum problem-solving communication issues in their relationship, actors who were more neurotic reported significantly fewer depressive symptoms if their partner was more agreeable than if he or she was less agreeable, $b = -5.97$, $p < .001$. However, when partners reported more problem-solving communication issues, less neurotic actors did not differ in depressive symptoms in relation to their partner's level of agreeableness, $b = 1.85$, $p = .18$. Finally, when partner-reported prepartum problem-solving communication issues were low, individuals higher and lower on neuroticism did not differ on depressive symptoms depending on their partner's level of agreeableness, $b = -0.87$, $p = .59$; $b = -0.67$, $p = .66$, respectively.

Affective communication (Hypothesis 4b)

Both actor and partner affective communication produced a significant main effect (see the actor and partner columns, respectively, in Table 6), with actor-reported prepartum affective communication being the somewhat stronger contributor to actors' depressive symptoms. In particular, poorer affective communication in the relationship reported by either the actor or the partner predicted higher actor depressive symptoms. There also was a significant 2-way interaction between actor-reported prepartum affective communication issues and gender, which was qualified in a significant 3-way interaction involving partner agreeableness (see the actor by partner column in Table 6).[6] The 2-way interaction between partner agreeableness and partner-reported affective communication issues was also significant and was qualified by a 3-way interaction with time (see the partner by partner column in Table 6).[7] Contrary to expectations, there were no significant interactions involving any of the personality trait variables (e.g. actor neuroticism and partner agreeableness predicting actor depressive symptoms).

Aggression (Hypothesis 5)

As shown in Table 7 (see the partner column), partner-reported prepartum aggression was significant, with more partner-reported aggression in the relationship predicting more actor depressive symptoms across the transition. A significant 2-way interaction between partner agreeableness and partner aggression (see the partner by partner column in Table 6), which was qualified by the hypothesized 3-way interaction involving actor neuroticism, also emerged (see the partner by actor by partner column in Table 7 and Figure 4). Specifically, when partners reported greater prepartum aggression in the relationship, actors who were more neurotic reported significantly fewer depressive symptoms if their partner was more agreeable than if they were less agreeable, $b = -6.51$, $p < .001$. However, when partners reported more aggression, less neurotic actors did not differ in their depressive symptoms as a function of their partner's level of agreeableness, $b = 0.12$, $p = .93$. And when partner-reported aggression was lower, individuals higher and lower on neuroticism did not differ on depressive symptoms based on their partner's level of agreeableness ($b = 0.04$, $p = .98$; $b = 0.81$, $p = .57$, respectively).

[6]For men who reported lower affective communication problems in the relationship, their depressive symptoms did not differ according to their partner's level of agreeableness, $b = -0.94$, $p = .51$. However, for women who reported lower affective communication problems, their depressive symptoms were marginally lower if their partner was more agreeable, $b = -3.00$, $p = .06$. Women who reported higher affective communication problems did not significantly differ based on their partner's level of agreeableness, $b = 1.13$, $p = .54$. For men who reported higher affective communication problems, their depressive symptoms were significantly lower if their partner was higher on agreeableness, $b = -3.48$, $p = .05$.

[7]For individuals with partners who reported lower affective communication problems in the relationship and scored either higher or lower on agreeableness, their level of depressive symptoms remained stable over time, $b = -0.02$, $p = .74$; $b = 0.01$, $p = .86$. For those with partners lower on agreeableness who reported higher affective communication problems, depressive symptoms were the highest and they did not differ over time, $b = -0.06$, $p = .16$. However, depressive symptoms for those with partners higher on agreeableness, reporting higher affective communication problems, increased over time, $b = 0.13$, $p = .02$.

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Table 5. Depressive symptoms as a function of actors' and partners' personality and problem-solving communication

Fixed effects	Actor	Partner	Actor × actor	Partner × partner	Actor × partner	Partner × actor	Actor × actor × partner	Partner × actor × partner
Intercept	9.02***							
Gender	−1.33**							
Time	0.01							
Gender × time	0.07*							
Neuroticism	3.41***	−0.03						
Gender × neuroticism	−0.80	0.85						
Time × neuroticism	−0.03	0.03						
Gender × time × neuroticism	−0.00	−0.03						
Agreeableness	−0.95	−1.42						
Gender × agreeableness	−0.33	−0.68						
Time × agreeableness	0.05	0.07						
Gender × time × agreeableness	0.05	−0.04						
Neuroticism × agreeableness			−0.82	0.13	−2.52**			
Neuroticism × neuroticism					0.32			
Gender × neuroticism × agreeableness			−1.42	−0.76	0.45			
Gender × neuroticism × neuroticism					−0.57			
Time × neuroticism × agreeableness			0.09	0.11*	0.03			
Time × neuroticism × neuroticism					−0.01			
Gender × time × neuroticism × agreeableness			0.13*					
Gender × time × neuroticism × neuroticism					0.07			
Problem solving	0.12	0.16						
Gender × problem solving	0.19	−0.13						
Time × problem solving	0.00	0.00						
Problem solving × neuroticism			0.10			−0.01		
Problem solving × agreeableness				−0.15	−0.04			
Problem solving × neuroticism × agreeableness							0.20	−0.54*
Gender × problem solving × neuroticism			−0.13			0.20		
Time × problem solving × neuroticism			−0.00			0.01		
Gender × problem solving × agreeableness				−0.17	0.08			
Time × problem solving × agreeableness				−0.00	0.01			
Gender × problem solving × neuroticism × agreeableness							0.17	−0.37
Time × problem solving × neuroticism × agreeableness							−0.01	0.02

Note: For gender, 1 = men, −1 = women. The actor/partner columns correspond to the order of the fixed effects. For example, for the interaction *Neuroticism × Agreeableness*, the *Actor × Actor* column refers to actor neuroticism and actor agreeableness, whereas the *Actor × Partner* column refers to actor neuroticism and partner agreeableness. With regard to *Problem solving × Neuroticism × Agreeableness*, the *Actor × Actor × Partner* column refers to actor problem solving, actor neuroticism, and partner agreeableness.

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

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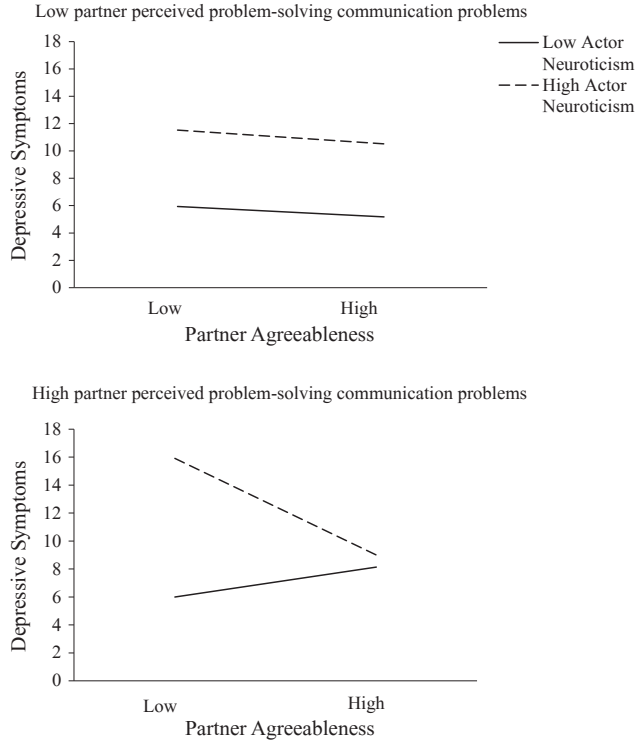

Figure 3. Depressive symptoms predicted by partner agreeableness, as moderated by actors' neuroticism and partner-reported prepartum problem solving in the relationship.

DISCUSSION

The purpose of this five-wave longitudinal study was to fill critical gaps in our knowledge regarding the prepartum factors that predict depressive symptoms across a very common and major life stressor—the transition to parenthood. The results confirmed the importance of prepartum actor neuroticism in predicting actors' depressive symptoms across the transition. They also demonstrated the importance of prepartum partner personality traits (especially agreeableness), the interaction between actor neuroticism and partner agreeableness, and especially the 3-way interaction between actor neuroticism, partner agreeableness, and prepartum negative communication patterns in relationships in predicting actor's depressive symptoms during the first 2 years of the transition to parenthood.

Actor trait effects

As we hypothesized, a person's degree of neuroticism proved to be a robust predictor of his or her depressive symptom levels across the transition to parenthood. Individuals who scored higher on neuroticism just before the birth of their first child experienced significantly more depressive symptoms than did their less neurotic counterparts. These results are consistent with prior transition to parenthood research, which indicates that greater prepartum neuroticism is prospectively linked to both greater postpartum depression (Areias et al., 1996; Dudley et al., 2001; O'Hara & Swain, 1996; Robertson et al., 2004; Verkerk et al., 2005) and more depressive symptoms (Matthey et al., 2000). Extending these findings, the dyadic and longitudinal design of our study—assessing both mothers and fathers (as opposed to focusing only on mothers) and measuring depressive symptoms (as opposed to clinical depression) for more than 2 years—confirms that neuroticism is indeed a strong predictor of depressive symptoms for *both* genders and for subclinical depressive symptoms. These results are also consistent with past work indicating that highly neurotic individuals have more intense reactions to stressors (e.g. Bolger & Zuckerman, 1995; Gunthert et al., 1999; Hutchinson & Williams, 2007; Kendler et al., 2004; Van Os & Jones, 1999).

Partner trait effects

Prior theory and research also suggests that a partner's disagreeableness should be a potent source of actors' depressive symptoms when chronically stressful events are encountered. Specifically, actors involved with less agreeable partners should—and did—experience comparatively higher depressive symptoms.

To our knowledge, this is the first study to examine the effects of partner agreeableness on actor depressive symptoms, particularly over a prolonged life transition. Our findings reveal that partner agreeableness is another important factor to consider in understanding the sources of depressive symptoms. One possible mechanism driving this partner low agreeableness → actor depressive symptom effect may be the negative interactions that less agreeable partners routinely have with their mates (e.g. Donnellan et al., 2004). It is important to note, however, that the partner agreeableness effect is somewhat weaker than the actor neuroticism effect in predicting actors' depressive symptoms, and the effect is no longer significant when partner's depressive symptoms are statistically controlled (see the APPENDIX). This is not surprising given that partner personality effects on relationship outcomes, such as marital satisfaction tend to be small-to-moderate in their effect sizes (Malouff et al., 2010). Nevertheless, the current findings still document the negative impact that partner disagreeableness has on actor depressive symptoms across a major and chronically stressful life transition.

Actor trait by partner trait effects

Because highly neurotic individuals tend to have more intense psychological reactions to interpersonal stressors (Gunthert et al., 1999) and should have more negative interactions with disagreeable partners in particular (Donnellan et al., 2004), we predicted that the specific pairing of high actor neuroticism and low partner agreeableness would forecast high levels of actor depressive symptoms. This is precisely what we found, and it was also the only significant actor personality trait by partner personality trait pairing that forecasted actors' depressive symptoms (see the APPENDIX). In addition, this effect remained statistically significant even when we statistically controlled for actor's and partner's attachment orientations, partner's depressive symptoms, and

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Table 6. Depressive symptoms as a function of actors' and partners' personality and affective communication

Fixed effects	Actor	Partner	Actor × actor	Partner × partner	Actor × partner	Partner × actor	Actor × actor × partner	Partner × actor × partner
Intercept	9.63***							
Gender	−1.25**							
Time	0.01							
Gender × time	0.07*							
Neuroticism	2.98***	−0.42						
Gender × neuroticism	−0.61	0.80						
Time × neuroticism	−0.03	0.03						
Gender × time × neuroticism	−0.00	−0.03						
Agreeableness	−1.10	−1.57*						
Gender × agreeableness	−0.21	−0.64						
Time × agreeableness	0.05	0.07						
Gender × time × agreeableness	0.03	−0.04						
Neuroticism × agreeableness			−0.10	0.97	−2.33*			
Neuroticism × neuroticism					0.26			
Gender × neuroticism × agreeableness			−1.05	−0.70	0.37			
Gender × neuroticism × neuroticism					−0.65			
Time × neuroticism × agreeableness			0.07	0.08	0.05			
Time × neuroticism × neuroticism					−0.03			
Gender × time × neuroticism × agreeableness			0.11*					
Gender × time × neuroticism × neuroticism					0.08			
Affective communication	0.68***	0.42*						
Gender × affective communication	0.53**	−0.29						
Time × affective communication	0.01	0.01						
Affective communication × neuroticism			0.26			−0.10		
Affective communication × agreeableness				−0.85*	0.20			
Affective communication × neuroticism × agreeableness							−0.61	0.42
Gender × affective communication × neuroticism			0.10			0.05		
Time × affective communication × neuroticism			−0.00			0.02		
Gender × affective communication × agreeableness				−0.55	−0.71*			
Time × affective communication × agreeableness				0.04*	−0.02			
Gender × affective communication × neuroticism × agreeableness							−0.02	−0.11
Time × affective communication × neuroticism × agreeableness							−0.02	0.01

Note: For gender, 1 = men, −1 = women. The actor/partner columns correspond to the order of the fixed effects. For example, for the interaction *Neuroticism × Agreeableness*, the *Actor × Actor* column refers to actor neuroticism and actor agreeableness, whereas the *Actor × Partner* column refers to actor neuroticism and partner agreeableness. With regard to *Affective communication × Neuroticism × Agreeableness*, the *Actor × Actor × Partner* column refers to actor affective communication, actor neuroticism, and partner agreeableness.
*$p < .05$.**$p < .01$.***$p < .001$.

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Table 7. Depressive symptoms as a function of actors' and partners' personality and aggression

Fixed effects	Actor	Partner	Actor × actor	Partner × partner	Actor × partner	Partner × actor	Actor × actor × partner	Partner × actor × partner
Intercept	9.13***							
Gender	−1.01*							
Time	0.01							
Gender × time	0.06*							
Neuroticism	3.86***	0.20						
Gender × neuroticism	−0.73	0.95						
Time × neuroticism	−0.04	0.03						
Gender × time × neuroticism	−0.01	−0.02						
Agreeableness	−0.80	−1.39						
Gender × agreeableness	0.07	−1.01						
Time × agreeableness	0.05	0.06						
Gender × time × agreeableness	0.05	−0.02						
Neuroticism × agreeableness			−0.13	0.31	−2.33*			
Neuroticism × neuroticism					0.54			
Gender × neuroticism × agreeableness			−0.72	−0.48	0.20			
Gender × neuroticism × neuroticism					−0.60			
Time × neuroticism × agreeableness			0.05	0.12*	0.04			
Time × neuroticism × neuroticism					−0.01			
Gender × time × neuroticism × agreeableness			0.13*					
Gender × time × neuroticism × neuroticism					0.08*			
Aggression	−0.20	0.41*						
Gender × aggression	0.34	−0.28						
Time × aggression	0.02	−0.01						
Aggression × neuroticism			0.27			0.12		
Aggression × agreeableness				−0.93*	0.58			
Aggression × neuroticism × agreeableness							0.39	−0.94*
Gender × aggression × neuroticism			−0.22			0.23		
Time × aggression × neuroticism			−0.03			−0.01		
Gender × aggression × agreeableness				−0.40	0.20			
Time × aggression × agreeableness				0.02	0.00			
Gender × aggression × neuroticism × agreeableness							0.07	−0.51
Time × aggression × neuroticism × agreeableness							0.02	−0.00

Note: For gender, 1 = men, −1 = women. The actor/partner columns correspond to the order of the fixed effects. For example, for the interaction *Neuroticism* × *Agreeableness*, the *Actor* × *Actor* column refers to actor neuroticism and actor agreeableness, whereas the *Actor* × *Partner* column refers to actor neuroticism and partner agreeableness. With regard to *Aggression* × *Neuroticism* × *Agreeableness*, the *Actor* × *Actor* × *Partner* column refers to actor aggression, actor neuroticism, and partner agreeableness.
*$p < .05$.**$p < .01$.***$p < .001$.

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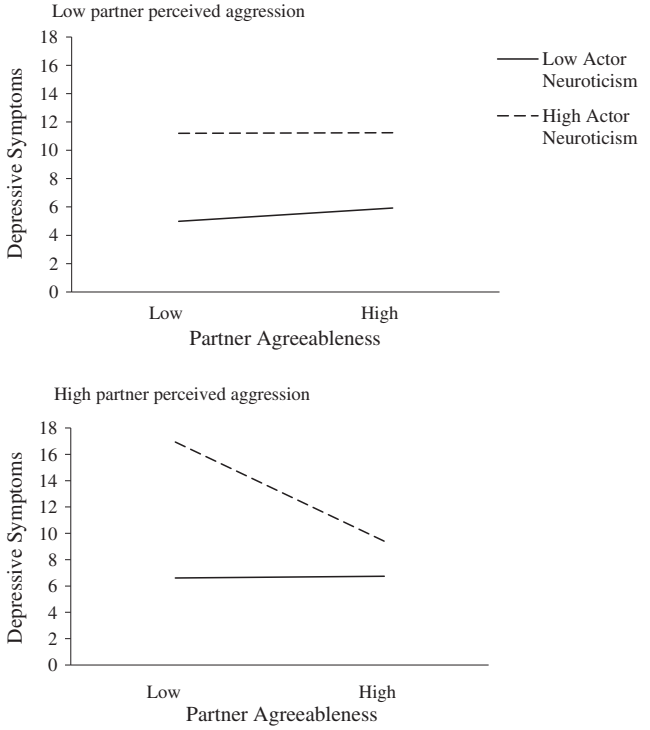

Figure 4. Depressive symptoms predicted by partner agreeableness, as moderated by actors' neuroticism and partner-reported prepartum aggression in the relationship.

other variables that were included in the personality trait–relationship models (see the APPENDIX).

As far as we know, no prior research has investigated this type of actor by partner personality trait interaction, despite the fact that one's romantic partner often constitutes the strongest and most salient part of the daily environment for most people. It is also important to emphasize that this effect was specific to depressive symptoms; it did not generalize to relationship quality (see the APPENDIX). Prior research has found little evidence that specific personality trait scores (particularly neuroticism) predict *changes* in relationship quality but certain traits do predict lower *levels* of relationship quality (e.g. Karney & Bradbury, 1997). No studies to date, however, have examined whether specific dyadic personality interaction patterns predict relationship quality across a stressful life transition. This is an important avenue for future research. Our results support relationship theorists' (e.g. Holmes, 2002; Zayas et al., 2002) contention that in order to understand and predict personal and relational outcomes fully, one must consider the *interaction* between an actor's dispositions and his or her partner's dispositions. The relational variables that moderated these unique actor by partner interaction effects were also explored within a 3-way actor personality trait by partner personality trait by relationship communication framework, which we discuss next.

Actor trait by partner trait by relationship context effects

Hypotheses 4 and 5 tested the likely moderators of the high actor neuroticism/high partner disagreeableness interaction predicting actor's depressive symptoms across time. We expected that the basic pattern found in the 2-way interaction would be clearest and strongest when partner-reported or actor-reported prepartum problem-solving communication (Hypothesis 4a) and/or affective communication distress/problems were high (Hypothesis 4b), or when prepartum aggression was high (Hypothesis 5).

The results supported Hypothesis 4a. Specifically, when partners reported greater prepartum problem-solving communication issues in the relationship, highly neurotic actors reported significantly more depressive symptoms if their partners were less agreeable. However, when partners reported more prepartum problem-solving communication issues, less neurotic actors did not differ in their depressive symptoms as a function of their partner's level of agreeableness. Conversely, when partner-reported prepartum problem-solving communication was low, individuals who scored either higher or lower on neuroticism did not differ on depressive symptoms based on their partner's level of agreeableness. Hypothesis 4b was not supported in that there were no significant interactions between actor neuroticism, partner agreeableness, and actor-reported or partner-reported affective communication.

Hypothesis 5, however, was supported. When partners reported more prepartum aggression in the relationship, highly neurotic actors had significantly fewer depressive symptoms if their partners were more agreeable. When their partners reported more prepartum aggression, however, less neurotic actors did not differ in depressive symptoms in relation to their partner's level of agreeableness, just as expected. And when partner-reported aggression was low, individuals who scored either higher or lower on neuroticism did not differ on depressive symptoms based on their partner's level of agreeableness.

Viewed together, these findings are consistent with and build upon prior research showing that highly neurotic individuals display less functional conflict strategies and more hostile/aggressive behaviour in their close relationships (e.g. Caughlin et al., 2000; Donnellan et al., 2004, 2005, 2007; Hanzal & Segrin, 2009; Hellmuth & McNulty, 2008; Vater & Schröder-Abé, 2015) and that stressors lead highly neurotic individuals to experience more depressive symptoms (e.g. Bolger & Zuckerman, 1995; Hutchinson & Williams, 2007). Given the similar inclinations of more disagreeable people to engage in more destruction communication patterns (e.g. Donnellan et al., 2004), these findings are also consistent with the hypothesis that the negative interactions experienced by couples containing a highly neurotic partner and a highly disagreeable partner should be particularly intense, resulting in high and sustained depressive symptoms in highly neurotic individuals.

This raises an important question: Why is the partner's level of agreeableness so powerful in evoking and sustaining depressive symptoms in highly neurotic actors? Very few studies have investigated whether and how the Big 5 are associated with negative interactions in romantic relationships, especially over time. In fact, we know of only two studies (Donnellan et al., 2004; Vater & Schröder-Abé, 2015) that have examined how each of the Big 5 traits are related to

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negative interactions in ongoing relationships. We suspect that more disagreeable partners, given their penchant for and skills at vindictiveness and spitefulness (e.g. Ahadi & Rothbart, 1994; Gleason et al., 2004; Jones et al., 2011; Robins et al., 1994), and generally poor perspective taking (Vater & Schröder-Abé, 2015), may be adept at 'pushing the buttons of' (or provoking negative affect in) their highly neurotic mates, leading both partners to become hostile and incapable of/poor at resolving major issues during relationship conflicts. These speculations should be tested in future behavioural observation studies with romantic couples.

Limitations and future research

Our longitudinal, dyadic study has some limitations. First, the generalizability of the results might be limited by the characteristics of our sample. Most of our participants were fairly well educated, Caucasian, and recruited from childbirth preparation classes. Second, similar to most transition to parenthood studies, we did not have a control group of childless couples. Hence, we cannot be certain that our findings are specific to experiencing the transition to parenthood per se, although we do know that individuals who have children experience much more stress and many more significant life changes than same-age peers who are married but do not have children (see Cowan & Cowan, 2000; Feeney et al., 2003). Future research should attempt to replicate these findings in other samples and contexts. Third, the results are correlational, so we cannot infer causality.

One important avenue for future research would be to determine whether certain facets of neuroticism and agreeableness (or whether certain facet *combinations* of these traits) are especially detrimental to other forms of personal or relational well-being during chronically stressful life events. For example, the specific combination of actors who score high on the volatility facet of neuroticism and partners who score low on the compassion facet of agreeableness may have the poorest outcomes in terms of depressive symptoms and indicators of marital satisfaction.

Another promising future avenue is to discern whether certain traits or unique actor/partner trait combinations (e.g. agreeableness, conscientiousness) buffer partners and couples from the often corrosive effects of highly stressful life transitions. For example, the unique constellation of actors and partners who both score high on the compassion facet of agreeableness may experience the best outcomes over time.

The current study was also not able to unveil the mechanisms responsible for the effects we observed. As shown in the APPENDIX, we did not find any significant moderated mediation effects between the actor neuroticism by partner agreeableness trait combination → Time 2–Time 4 actor relationship variables (e.g. perceived social support, negative interactions, and perceived closeness) → Time 5 actor depressive symptoms. Thus, our depressive symptom effects are *not* driven by actors' evaluations of their relationships. Future research needs to identify the mechanisms generating these outcomes. It is possible, for example, that hostile arguments lead highly neurotic individuals to view themselves more negatively and to feel as if they cannot cope effectively with the stressors at hand (as indicated by lowered self-esteem and decreased self-efficacy), which then predicts more depressive symptoms. If negative self-views are the mechanisms driving this effect, this may explain why this specific dyadic personality trait interaction uniquely predicted depressive symptoms but did not predict relationship satisfaction. Future researchers who try to pin down these potential mechanisms may benefit by acknowledging that the effect that personality traits have on relationships involves the interplay between social cues (e.g. behaviour and affect), interpersonal perceptions, and personality self-views (see Back, Baumert, et al., 2011, for one theoretical framework; see Back, Schmukle, & Egloff, 2011, for an example applied to attraction at zero acquaintance. See also Vater & Schröder-Abé, 2015, for an example applied to committed couples in this special issue).

Conclusion

In conclusion, prepartum actor neuroticism and low partner agreeableness appear to be a particularly caustic combination that predicts higher levels of depressive symptoms in actors across the transition to parenthood, especially when communication within the relationship before childbirth is dysfunctional. These results are consistent with Donnellan et al. (2004), who have suggested that dispositions shape the 'psychological infrastructure' of romantic relationships early on in relationships and then have stable influences on relationships and their outcomes over time. Future research needs to consider not only an individual's own personality, but his or her *partner's personality* in combination with the general relationship context. After all, the personality characteristics of one's romantic partner may often be the strongest, most stable, and most salient feature of an individual's daily environment.

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APPENDIX

Models testing alternate explanations

To determine whether our central findings might be explained by prepartum attachment orientations or partner depressive symptoms, the models described in the Results section (the personality-only model and the three personality and relationship models) were run three more times, controlling for the fixed main effects of (i) attachment anxiety (actor and partner), (ii) attachment avoidance (actor and partner), and (iii) partner depressive symptoms. In prior research, attachment orientations (e.g. Noftle & Shaver, 2006; Shaver & Brennan, 1992) and depressive symptoms have been found to correlate significantly with neuroticism (Chioqueta & Stiles, 2005; Matthey et al., 2000). Attachment orientations were measured using the reliable and valid Adult Attachment Questionnaire (Simpson, Rholes, & Phillips, 1996).

The findings relating to the hypotheses (actor personality effects, partner personality effects, and actor by partner effects) remained the same in the models that statistically controlled for attachment orientations and partner depressive symptoms (with one exception: partner agreeableness, $p = .13$, in the partner depressive symptom model). Differences in the models external to the hypotheses included one 4-way interaction between gender, time, actor agreeableness, and partner neuroticism that became significant in the attachment anxiety model ($b = 0.12$, $p = .05$), and one 3-way interaction between time, partner neuroticism, and partner agreeableness that was no longer significant in the partner depression model ($p = .34$).

Finally, a model with all actor and partner Big 5 personality traits and all possible actor by actor and actor by partner personality combinations was also conducted (time and gender interactions were omitted because of lack of power). Significant main effects emerged for actor neuroticism ($b = 3.31$, $p < .001$), actor openness ($b = 1.04$, $p = .04$), actor extraversion ($b = -0.95$, $p = .02$), partner extraversion ($b = -0.99$, $p = .01$), and actor conscientiousness ($b = -1.56$, $p = .01$). One 2-way interaction also emerged between actor agreeableness and actor extraversion ($b = -1.70$, $p = .01$). Individuals higher on extraversion had fewer depressive symptoms when they also scored higher on agreeableness, $b = -1.63$, $p < .001$. Individuals lower on extraversion had more depressive symptoms if they also scored higher on agreeableness, $b = 1.19$, $p = .02$. However, the *only* significant actor by partner interaction found was the predicted one between partner disagreeableness by actor neuroticism ($b = -2.34$ $p = .01$). Hence, only one other partner effect emerged (for partner extraversion), and no other systematic 2-way actor by partner interactions were found when *all* of the Big 5 personality traits were tested.

Relationship satisfaction as an outcome

We also tested whether the central actor by partner personality interaction (actor neuroticism by partner agreeableness) was specific to depressive symptoms or whether the same results emerged for relationship satisfaction [using the satisfaction subscale of Spainer's (1976) Dyadic Adjustment Scale]. Relationship satisfaction was significantly predicted by Time ($b = -0.10$, $p < .001$), actor neuroticism ($b = -1.74$, $p < .001$), partner neuroticism ($b = -1.53$, $p < .001$), and Time by actor agreeableness ($b = 0.07$ $p = .03$). More specifically, relationship satisfaction decreased over the transition for less agreeable individuals ($b = -0.15$, $p < .001$), but it remained stable for highly agreeable ones ($b = -0.06$, $p = .07$). No other actor by partner personality effects emerged. Our primary effects, therefore, are specific to depressive symptoms.

Mediation analyses

Although we hypothesized that the actor neuroticism by partner agreeableness interaction would be moderated by prepartum measures of communication and aggression in the relationship, we explored the possibility of moderated mediation between the central personality interaction (actor neuroticism by partner agreeableness → Time 2–Time 4 relationship variables → actor depressive symptoms at Time 5). The relationship variables tested included perceived social support available from the spouse/partner (Social Support Questionnaire; Sarason, Levine, Basham, & Sarason, 1983), perceived negative interactions with the spouse/partner (Negative Social Interaction Scale; Finch, Okun, Pool, & Ruehlman, 1999), perceived closeness with the spouse/partner [including both the cohesion subscale from Spanier's (1976) Dyadic Adjustment Scale, and Aron, Aron, and Smollan's (1992) Inclusion-of-Self-in-the-Other Scale], perceptions of the spouse's/partner's caregiving

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(Caregiving Scale; Kunce & Shaver, 1994), and the MSI-R subscales (discussed in the Methods section).

Following Baron and Kenny (1986), we first examined the zero-order correlations between (i) prepartum actor neuroticism by partner agreeableness and Time 5 depression (while partialling out the main effects), (ii) prepartum actor neuroticism by partner agreeableness and each Time 2–Time 4 (aggregated) actor-reported relationship variable (while partialling out the main effects), and (iii) each Time 2–Time 4 (aggregated) actor-reported relationship variable and Time 5 depressive symptoms. Consistent with the analyses reported in the article, the partial correlation between the actor neuroticism by partner agreeableness interaction and Time 5 depression was significant ($r = -.16$, $p = .01$). However, none of the partial correlations between the dyadic personality interaction and any of the relationship variables were significant or marginally significant (ranging from $r = .01$, $p = .92$ for actor-reported aggression to $r = .09$, $p = .15$ for actor-reported partner sensitivity). Because these correlations were not significant, further analyses testing moderated mediation models were not conducted.

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