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Associations Between Prenatal Coparenting Behavior and Observed Coparenting Behavior at 9 Months Postpartum

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Abstract

Coparenting, or the ways partners relate to each other in their roles as parents, is important to child and family functioning. However, it remains unclear whether coparenting begins at or prior to a child's birth. This study tested whether expectant parents' behavior in the Prenatal Lausanne Trilogue Play procedure (PLTP), an assessment designed in Switzerland for examining prebirth coparenting behavior, forecasted postnatal observations of coparenting behavior in a sample of first-time parents in the United States. 182 dual-earner couples expecting their first child participated in the PLTP during the third trimester of pregnancy, and at 9 months postpartum, observations of coparenting behavior were obtained from mother-father-infant play interactions. Structural equation modeling analyses indicated significant continuity between expectant parents' prenatal coparenting behavior and their observed postpartum coparenting behavior one year later. In particular, couples who engaged in higher quality prenatal coparenting behavior demonstrated more supportive and less undermining coparenting behavior at 9 months postpartum, even after controlling for observed prenatal couple behavior and self-reported couple relationship functioning. Thus, this study demonstrated the validity and utility of the PLTP as a window into the development of coparenting, and supported the notion that the coparenting relationship develops prior to the child's birth and is already distinct from the couple relationship.

Keywords

coparenting; Lausanne Trilogue Play; transition to parenthood; family alliance; dual-earner couples

At the transition to parenthood, the couple relationship reorganizes into a family system headed by the coparenting relationship, or "executive subsystem" (Minuchin, 1974), which is related to but distinct from the preexisting relationship between the partners (Schoppe-Sullivan, Mangelsdorf, Frosch, & McHale, 2004). The quality of the coparenting relationship is reflected by the degree to which parents function as cooperative partners or adversaries in child rearing (Feinberg, 2003), and has been consistently linked to child and family functioning (Teubert & Pinquart, 2010). Although the coparenting relationship is

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undoubtedly shaped by postpartum parenting experiences, some have posited that this relationship emerges during pregnancy (Feinberg, 2002), whereas others have argued that coparenting does not begin until after the child's birth (Van Egeren & Hawkins, 2004). Resolving this question has remained challenging because studies of the emerging coparenting relationship have relied on perceptions (via self-reports) or representations (via interviews) of coparenting at the prenatal stage, whereas measures of coparenting postpartum typically involve observations of behavior (McHale & Rotman, 2007; Schoppe-Sullivan & Mangelsdorf, 2013). Thus, in part because of differences in measurement in the prenatal and postpartum phases, it remains unclear whether coparenting develops prenatally.

To address this important question about the development of coparenting, the present study used the Prenatal Lausanne Trilogue Play procedure (PLTP; Carnerio, Corboz-Warnery, & Fivaz-Depeursinge, 2006) to assess prenatal coparenting at a behavioral level in a sample of first-time parents in the United States. In particular, this study tested whether prenatal coparenting behavior forecasted coparenting behavior at 9 months postpartum using validated measures of postpartum coparenting behavior and controlling for observations and self-reports of prenatal couple relationship functioning. Should prenatal coparenting behavior predict postnatal coparenting behavior above and beyond measures of couple relationship functioning, the contention that coparenting develops prenatally and is distinct from the couple relationship would be supported. Such findings would not only aid in the theoretical understanding of family development, but would aid in the design of intervention efforts that seek to improve the coparental relationship even before the child's birth (Feinberg, 2003).

History of the Prenatal Lausanne Trilogue Play (PLTP)

The PLTP (Carnerio et al., 2006) is a structured observational assessment that is used late in pregnancy and requires expectant parents to play in four parts with a gender-neutral and expressionless doll: (1) one expectant parent plays with the doll, (2) the second expectant parent plays with the doll, (3) both expectant parents play together with the doll, and (4) the expectant parents talk together after putting the doll "to sleep." This assessment capitalizes on the internal representations of the "imaginary baby" that expectant parents construct (Stern, 1995) by prompting expectant parents to project those representations onto the doll. Moreover, because expectant parents are required to interact with the "baby" both in the presence of, and together with, their partners, the PLTP is believed to capture how coparenting representations are put into action via behavior during the prenatal period. Coding of the PLTP assesses coparenting through playfulness, cooperation, family warmth, structure of play, and intuitive parenting behaviors. As an observational measure of emerging coparenting behavior that is free of some of the biases of self-reports and can transcend representations, the PLTP has great potential for enhancing understanding of the development of coparenting. However, the PLTP has never before been used to examine continuities between prenatal and postnatal coparenting behavior.

Instead, because the PLTP was adapted from the original, postnatal Lausanne Trilogue Play procedure (Fivaz-Depeursinge & Corboz-Warnery, 1999), which was designed to assess family alliance via mother-father-infant triadic interactions, research using the PLTP has

focused on its ability to predict subsequent family alliance (Carneiro et al., 2006; Favez et al., 2012; Favez, Frascarolo, Lavanchy Scaiola, & Corboz-Warnery, 2013). However, family alliance quality is not synonymous with coparenting behavior. Whereas the family alliance construct focuses on family-level interactional processes, with an emphasis on triadic coordination and shared positive affect (Fivaz-Depeursinge & Corboz-Warnery, 1999), coparenting focuses on interactions between parents in their roles as joint caregivers, stressing the importance of supportive and undermining behavior (Feinberg, 2003). Accordingly, the coding of family alliance has traditionally focused on non-verbal communication cues, such as body position, and has not considered coparenting behaviors between parents. Moreover, family alliance cannot be measured prenatally because the infant cannot actively contribute to family interactions. Only the coparents are present prenatally, which is why the PLTP captures coparenting and not family alliance. Thus, even though the PLTP was designed to assess prenatal coparenting behavior, it remains unknown whether the behaviors coded during this innovative observational procedure actually forecast observed postpartum supportive and undermining coparenting behaviors, which have been consistently linked to child outcomes (Teubert & Pinquart, 2010).

The Development of Coparenting at the Transition to Parenthood

Scholars of the transition to parenthood have long recognized that the family system begins to reorganize prior to the birth of the infant. However, disagreement exists regarding whether the coparenting relationship emerges prenatally (Feinberg, 2002) or postnatally (Van Egeren & Hawkins, 2004). Some have posited that expectant parents develop representations of coparenting prenatally (McHale, 2007) by making psychological “space” for the child in relation to both the self and partner (von Klitzing & Bürgin, 2005) and by engaging in shared fantasies regarding the child’s physical characteristics and/or temperament (Ammaniti, Trentini, Menozzi, & Tambelli, 2014), with some couples better able to establish optimistic representations than others. In fact, empirical evidence supports this view. McHale et al. (2004) established that expectant parents’ pessimistic outlooks regarding coparenting predicted lower levels of coparenting cooperation and warmth postnatally. McHale and Rotman (2007) extended these findings by demonstrating that prenatal expectations of coparenting persisted as predictors of coparenting solidarity through 30 months postpartum.

However, it is unclear whether prenatal representations of coparenting reveal the prenatal development of coparenting relationships or reflect antecedents of the coparenting relationships that new parents will go on to develop in the early postpartum period. Representing the latter perspective, Van Egeren and Hawkins (2004) argued that important predictors of coparenting emerge prenatally, but coparenting is an “explicit dimension [occurring] only after the child’s birth” (p. 166). Key to this discussion is the centrality of interparental behavior to the coparenting construct and the assumption that coparenting behavior cannot be assessed until the child is born. Indeed, relying on perceptions of prenatal coparenting as illustrative of the developing coparenting relationship is problematic because there is oftentimes a striking disconnect between people’s perceptions and their behavior (Baumeister, Vohs, & Funder, 2007; Nisbett & Wilson, 1977). However, the PLTP has strong potential to shed light on this issue by providing an opportunity to observe how

expectant parents put their representations into action via prenatal coparenting behavior. Only one prior published study has used the PLTP in the U.S. to study the development of coparenting. In this investigation, Schoppe-Sullivan, Kamp Dush, and Bower (2013) found associations between prenatal coparenting behavior and fathers' (but not mothers') self-reports of postnatal coparenting. However, as noted above, no prior study has examined whether prenatal coparenting behavior in the PLTP predicts postnatal coparenting behavior, which would provide the best evidence to date that coparenting develops prenatally.

The Present Study

Understanding when and how the coparenting relationship develops has significant implications for knowledge regarding the transition to parenthood and strategies for prevention/intervention at this critical juncture in family development (Feinberg, 2002). Such an understanding cannot be achieved, however, without going beyond prenatal perceptions and representations of coparenting to behavioral measures of emerging coparenting dynamics. The present study tested whether prenatal coparenting behavior assessed during the PLTP predicts postnatal observations of supportive and undermining coparenting behavior (Schoppe, Mangelsdorf, & Frosch, 2001) – those aspects of coparenting that have been most consistently linked to child outcomes (Teubert & Pinquart, 2010).

Moreover, unlike any prior study that has used the PLTP, we included stringent controls for the quality of the preexisting couple relationship, which in theory is related to yet distinct from the coparenting relationship (Schoppe-Sullivan et al., 2004). Prior studies that have used prenatal coparenting behavior assessed in the PLTP to predict postnatal family alliance have controlled for self-reports of couple functioning (e.g., Favez et al., 2012, 2013), but given that self-reports and observations are often unrelated (Lorenz, Melby, Conger, & Xu, 2007), these represent weak controls. In order to ascertain that coparenting develops prenatally it is critical to distinguish the coparenting and couple relationships behaviorally. Without doing so it is difficult to defend the notion that the PLTP is measuring anything beyond couple relationship dynamics.

Consistent with the view that coparenting develops prenatally, we anticipated that higher quality prenatal coparenting behavior would be associated with greater supportive and less undermining behavior at 9 months postpartum even after controlling for observations and reports of prenatal couple functioning.

Method

Participants

Data were drawn from a study of 182 different-sex dual-earner couples, who were studied to examine the parenting experiences of couples in which both partners had to balance work and family. Participating couples were recruited from childbirth education classes, advertisements (i.e., newspapers, flyers), and participant referrals. Eligible expectant parents had to be married or cohabiting, 18 years or older, expecting their first child, the biological parents of the child, able to read and speak English, and working full-time prior to their

child's birth and planning to return to work shortly after the birth. Couples were assessed in the third trimester of pregnancy, and at 3, 6, and 9 months postpartum. In accordance with procedures approved by the University's Institutional Review Board, informed consent was obtained from each partner at each phase of the study. For the current study we focused on the observations and surveys completed in the third trimester and the observations completed at 9-months postpartum.

Of the 182 couples, 86% were married. The median level of education for these expectant parents was a bachelor's degree, and the median annual family income was \$79,500. Mothers were 28.24 years old on average ($SD = 4.02$, range: 18–42), and fathers were 30.20 years old on average ($SD = 4.81$, range: 18–50). The majority of participants were White (85% of mothers and 86% of fathers), with 6% of mothers and 7% of fathers self-identifying as Black, 3% of mothers and 3% of fathers self-identifying as Asian, 2% of mothers and 4% of fathers self-identifying as other races, and 4% of mothers and 1% of fathers self-identifying as more than one race. Four percent of mothers and 2% of fathers identified themselves as Hispanic. Forty-nine percent of the children born to participating parents were female. At the time of the 9-month follow-up, consistent with the low-risk nature of the sample, all mothers described the health of their infants as excellent (71%), very good (27%), or good (2%).

153 couples from the original sample participated in the observational portion of the 9-month assessment. The most common reason given for nonparticipation at 9 months was that the family was too busy to participate. *T*-test comparisons of families who participated in the 9-month observations versus those who did not on demographic variables indicated no significant differences. There were also no significant differences between participants and nonparticipants on prenatal self-reported couple relationship adjustment and negative interaction, and observed couple behavior and prenatal coparenting behavior in the third trimester of pregnancy.

Procedure

The third trimester assessment included a visit to the couple's home during which each couple completed the Prenatal Lausanne Trilogue Play (PLTP; Carneiro et al., 2006). In this study, the PLTP was conducted in the third trimester of pregnancy and in participants' homes, whereas the PLTP has traditionally been conducted late in the second trimester and in a laboratory setting. To standardize the procedure, two folding chairs and a small table were brought to each couple's home and aligned using a special mat marked with the proper distances (F. Frascarolo, personal communication, July 24, 2008). The "baby" that expectant parents played with was custom-made and consisted of a footed infant sleeper sewn shut with approximately 7–8 lbs. of rice inside to make its weight similar to that of a newborn. The doll's head was made of green fabric with polka dots, filled with stuffing, and sewn onto the footed sleeper. The colors of the fabric for the doll's head and clothes were gender-neutral and did not imply any particular racial or ethnic background. The PLTP episodes were recorded using a single, tripod-mounted camera that captured both parents' faces and upper bodies.

In keeping with the standard PLTP procedures, research assistants instructed parents to “Imagine the moment when the three of you meet for the first time after the delivery. Please play this out in four parts: first, one of you plays with the ‘baby’ alone, and then the other one. Then, please play together with the ‘baby,’ and finally, let him/her ‘go to sleep’ and talk together about the experience you just went through. You can decide who plays with the ‘baby’ first on your own. We will leave the room. Please signal when you are finished.” Before the couple began the LTP, a female research assistant “warmed up” the couple to the role playing by pretending to be the “nurse” bringing the “baby” to them, wrapped in a blanket. The “nurse” said the following, in a lighthearted but not silly tone: “Hi baby! Aren’t you so cute? I’m sure your mommy and daddy are so excited to meet you! See, here they are. There’s your mommy; there’s your daddy. I think they want to play with you, so I’m going to put you down right here.” Next the “nurse” placed the “baby” in the basket on the small table between the parents and left the room. The other research assistant reminded the parents to “play in four different parts: first one of you plays alone with your ‘baby,’ you can choose who, and then the other one plays alone. Then play together with your ‘baby,’ and lastly let him/her ‘go to sleep’ and discuss your experience. Signal us when you are finished.”

Also at the home visit, couples participated in the Marital Agendas Protocol (Notarius & Vanzetti, 1983), an observational assessment of couple behavior. Prior to this observation, each partner was asked to complete a brief survey regarding the severity of various relationship problems and assign scores from 0–100 to each problem. After completing the surveys, couples were asked to share their responses and choose one of their more significant problems to discuss for 10 minutes with the goal of reaching an agreeable solution. The ensuing discussions were videotaped and coded for couple behavior as described below. The order of completion of the PLTP and couple behavior assessment was determined by a coin flip; 42% of the couples completed the PLTP first and 58% of the couples completed the couple discussion first. In addition, approximately two weeks prior to the third trimester home visits, each partner independently completed a series of questionnaires – including measures of couple relationship adjustment and negative interaction– either via paper-and-pencil or online.

At 9 months postpartum, couples again completed an in-person observational assessment. The majority of these assessments (67.3%) took place in research space at a local science center, although families were permitted to complete assessments in their homes if that was more convenient for them. As part of the 9-month assessments, parents completed two 5-minute videotaped triadic interaction tasks in which they were asked to introduce two different toys to their infants together. Specifically, parents were instructed: “We are now going to ask the three of you to play together as a whole family for 10 minutes. For the first 5 minutes, we are going to give you a new toy (jack-in-the-box) to introduce to your baby together. Please introduce the toy to your baby together and continue to play with your baby for 5 minutes. For the second 5 minutes, we will give you an additional toy to play with (pop-up toy). For this last 5 minutes please just play together as you normally would if you had a few extra minutes in your day.”

These episodes were videotaped and subsequently coded for coparenting behavior, as described below. We tested whether coparenting differed for families whose assessments were conducted at the science center versus those whose assessments were conducted at home. Only one significant difference emerged: Mothers in families who completed the assessment at home showed greater displeasure ($M = 3.55$, $SD = 1.34$) than mothers in families who completed the assessment at the science center ($M = 2.93$, $SD = 1.24$), $t(151) = -2.85$, $p < .01$.

Measures

Prenatal coparenting behavior—A team of trained research assistants rated the quality of prenatal coparenting behavior from the videotaped PLTP episodes using an adapted version of Carneiro et al.'s (2006) coding system (available upon request from the second author). The scales rated were: 1) *couple cooperation*, or the extent to which partners actively supported each other's involvement in the role play; 2) *coparent playfulness*, or the extent to which the partners were able to successfully engage in the role play together without taking it too seriously (e.g., getting extremely emotional) or not seriously enough (e.g., laughing the entire time); 3) *family warmth*, or affection and humor shared by the partners during play – both towards each other and towards the “baby”; 4) *structure of the play*, which assessed whether the couple structured the play according to the directions – whether all four parts of the play were distinguishable and of appropriate duration; and 5) *intuitive parenting behaviors*, which tapped the extent to which expectant mothers and fathers displayed six parenting behaviors towards the “baby”: holding or facing the baby, dialogue distance, “baby talk” and/or smiling at the baby, caressing and/or rocking, exploring the baby's body, and preoccupation with the baby's well-being (separate ratings were made for expectant mothers and fathers). The behaviors assessed using these scales were identical to those in Carneiro et al.'s (2006) system except that we expanded the scales from 3-points to 5-points to better capture variability between and within families. Intraclass correlations for the six prenatal coparenting behavior scales ranged from .80 to .95 based on 33% randomly selected double-coded episodes.

In anticipation of the construction of a latent variable to represent prenatal coparenting behavior, we examined the correlations among the PLTP coding scales. All the scales were moderately intercorrelated (see Table 1) with the exception of *structure of the play*, which was only significantly associated with coparent playfulness, and had an overall average correlation with the other scales of .08. In their PLTP study, Simonelli, Bighin and de Palo (2012) also found that structure of the play did not cohere well with the other coding scales. Thus, we excluded structure of the play from further analysis. As per Carneiro et al. (2006), the five remaining scales were used as indicators of a latent variable representing prenatal coparenting behavior, as described in further detail below.

Coparenting behavior at 9 months postpartum—A different team of trained research assistants rated the quality of couples' coparenting behavior from the videotaped family play episodes at 9 months postpartum using 5-point scales originally developed by Cowan and Cowan (1996) and used to assess coparenting behavior in families with infants in previous research (Schoppe-Sullivan et al., 2004; Schoppe-Sullivan & Mangelsdorf,

2013). The scales used as indicators of supportive coparenting in the present study were *cooperation* (degree of emotional and instrumental support between partners) and *pleasure* (degree to which parents enjoy collaborating in parental role and watching each other interact with the infant). The scales that indicated undermining coparenting were *competition* (degree to which parents interfere with each other's efforts to interact with the child and/or vie for the infant's attention/affection) and *displeasure* (degree to which parents display dislike for the other parent's style of interacting with or relationship with the infant). In this study, cooperation and competition were rated at the level of the coparenting subsystem whereas pleasure and displeasure were rated at the level of the individual parent. Coders overlapped on 56.2% randomly selected episodes and intraclass correlations ranged from .74 to .86, reflecting acceptable interrater reliability. Ratings on each scale were significantly and moderately correlated across the two 5-minute episodes; thus, ratings for each scale were summed across episodes.

Control variables—Prior to the home visit in the third trimester, each partner completed two questionnaires tapping prenatal functioning in the couple subsystem: the brief Dyadic Adjustment Scale (Sabourin, Valois, & Lussier, 2005) and the Negative Interaction scale (Stanley, Markman, & Whitton, 2002). The brief DAS consisted of 4 items measuring overall adjustment in the couple relationship and required respondents to rate how often (1 = *never*; 6 = *all of the time*) three situations arose within their relationship (e.g., “how often do you discuss or have you considered divorce, separation, or terminating your relationship?”) as well as to report their overall happiness in the relationship (0 = extremely unhappy; 6 = perfect). The Negative Interaction scale assessed the frequency of destructive conflict in the relationship. Partners reported how often (1 = *never or almost never*; 3 = *frequently*) four negative situations occurred in their relationship (e.g., “little arguments escalate into ugly fights with accusations, criticisms, name calling, or bringing up past hurts”). One item from the brief DAS was dropped due to low item-total correlations. The Negative Interaction item scores were averaged separately for expectant mothers and fathers, as were the brief DAS items. In the current study, Cronbach's alphas for the brief DAS were .64 for expectant mothers and .63 for expectant fathers, and alphas for the Negative Interaction scale were .66 for expectant mothers and .76 for expectant fathers.

The 10-min observational assessments of couple behavior were coded by a third team of trained research assistants who rated these interactions using a modified version of the System for Coding Interactions in Dyads (SCID; Malik & Lindahl, 2004) – the System for Coding Interactions among New Parents (SCINP; Hunt, Kamp Dush, & Schoppe-Sullivan, 2010). The scales used in the present study were those that best represented the overall quality of couple behavior and had the highest interrater reliabilities: 1) *global interaction quality*, or the overall observed quality of the relationship; 2) *negative escalation*, which assessed how often negative interaction cycles ensue in which a partner's negative behavior was responded to with negative behavior by the other partner, with the first partner completing the cycle by responding again with negative behavior; 3) *cohesiveness*, or the unity, closeness, and teamwork displayed by the couple; and 4) *individual problem solving communication*, or the extent to which each partner's behavior was constructive and promoted the discussion (this fourth scale was separately rated for expectant mothers and

fathers). Each scale was rated from 1 (*very low*) to 5 (*high*), except global interaction quality which was rated 1 (*very low*) to 7 (*very high*). Both coders rated each episode and intraclass correlation coefficients ranged from .79 to .89.

Results

Analysis Plan

First, descriptive statistics and intercorrelations for the variables of interest were computed and interpreted. Second, additional analyses were conducted using structural equation modeling in IBM SPSS AMOS 19.0. Full Information Maximum Likelihood Estimation was used to model missing data as this method has clear advantages in reducing bias and increasing power over traditional methods (e.g., listwise and pairwise deletion; Enders, 2013).

A measurement model was tested, and subsequently, the structural model examining prenatal coparenting behaviors as predictors of observed coparenting behavior at 9 months postpartum was estimated. Following Bollen and Curran (2006) and Hu and Bentler (1999), we examined four fit indices: the chi-square (χ^2), which indicates a good model fit when non-significant, but tends to be sensitive to small discrepancies between the hypothesized model and the data as sample size increases; the Tucker Lewis Index (TLI) and the Comparative Fit Index (CFI), which indicate acceptable model fit when above 0.95; and the Root Mean Square Error of Approximation (RMSEA), which indicates acceptable model fit when below 0.06.

Preliminary Analyses

Descriptive statistics and intercorrelations—Descriptive statistics for all variables are shown in Tables 1 and 2. On average, couples showed high quality prenatal coparenting behavior, with high average levels of cooperation, playfulness, and family warmth (scores of approximately 4 on 5-pt scales), and moderate levels of intuitive parenting behaviors (scores between 3 and 4 on a 5-pt scale) observed. Moreover, on average couples were rated as having relationships high in global quality and cohesiveness (indicated by scores above the mid-points of these scales) and low in negative escalation (scores between 1 and 2 on a 5-pt scale) in the third trimester of pregnancy; however, more moderate levels of problem solving behavior were observed (scores at the midpoint of the scale). Expectant mothers' and fathers' reports about couple relationship functioning were also quite positive: expectant parents reported high average levels of dyadic adjustment (between 5 and 6 out of a maximum score of 6) and low average levels of conflict (between 1 and 2 on a 3-point scale). With respect to observed coparenting behavior at 9 months postpartum (Table 2), on average parents demonstrated moderate to high levels of supportive coparenting behavior (cooperation, pleasure; scores of 3 to 4 on 5-pt scales) and low levels of undermining coparenting behavior (competition, displeasure; scores of 1 to 2 on 5-pt scales).

Intercorrelations among the prenatal coparenting behavior, observed couple behavior, and reported couple functioning variables in the third trimester of pregnancy revealed anticipated patterns (Table 1). Some significant but modest associations in expected directions were

found between aspects of prenatal coparenting behavior and observed couple behavior. However, only one association between prenatal coparenting behavior and reported couple functioning reached significance. Numerous significant associations of modest to moderate strength were found between observed couple behavior and reported couple functioning.

Correlations of the prenatal variables (prenatal coparenting behavior, observed couple behavior, and reported couple functioning) with postpartum observed coparenting behavior were consistent with hypotheses (Table 3). Aspects of prenatal coparenting behavior were consistently associated with postpartum observed coparenting behavior; in particular, playfulness and fathers' intuitive parenting behavior during the PLTP showed the strongest and most consistent patterns of significant associations with postpartum coparenting behavior. Similarly, observed couple behavior was consistently associated with postpartum coparenting behavior as well, with the strongest and most consistent patterns of associations driven by global interaction quality, cohesiveness, and fathers' problem solving behavior. With respect to reported couple relationship functioning, the pattern of associations with postpartum observed coparenting behavior was weaker, although mothers' reports of dyadic adjustment and negative interaction were consistently but modestly associated with coparental cooperation and competition.

Construction of latent variables—Patterns of intercorrelations (Table 1) supported the construction of a single latent variable representing prenatal coparenting behavior. The five indicators of this variable were: couple cooperation, playfulness, family warmth, and mothers' and fathers' intuitive parenting behavior.

A single latent variable was also constructed to represent prenatal observed couple behavior. This variable was indicated by the following five scales: global interaction quality, negative escalation, cohesiveness, and mothers' and fathers' problem solving. An additional latent variable with four indicators reflected parents' prenatal perceptions of functioning in their couple relationship; the indicators were mothers' and fathers' reports of dyadic adjustment and negative interaction. Correlations among these sets of variables (Table 1) were also consistent with the construction of latent variables.

The measurement model of observed coparenting behavior at 9 months postpartum included two latent variables with three indicators each: supportive coparenting (indicated by cooperation and each parent's pleasure) and undermining coparenting (indicated by competition and each parent's displeasure). Although all six indicators showed moderate to strong intercorrelations (Table 2), separate latent variables for supportive and undermining behavior were constructed consistent with theory and research that suggests that these are related yet distinct aspects of coparenting (Schoppe-Sullivan & Mangelsdorf, 2013).

These sets of latent variables were tested simultaneously in a measurement model using AMOS 19.0. In this model, all latent variables were allowed to correlate with each other. Although the chi-square test was significant, $\chi^2(154) = 192.30, p = .02$, other indices suggested acceptable model fit: TLI = .97; CFI = .98; RMSEA = .04. All factor loadings were statistically significant, and standardized loadings ranged in absolute value from .46 to .99.

Structural Model Test

Next we estimated the structural model including prenatal coparenting behavior as a predictor of observed coparenting behavior at 9 months postpartum (controlling for prenatal observed couple behavior and reported couple functioning). Results are shown in Figure 1. Again, although the chi-square test was significant, $\chi^2(154) = 192.30, p = .02$, other indices suggested acceptable model fit: TLI = .97; CFI = .98; RMSEA = .04. Even after controlling for prenatal observed couple behavior, which was significantly associated with postnatal observed supportive and undermining coparenting behavior, prenatal coparenting behavior was significantly associated with both observed supportive and observed undermining coparenting behavior at 9 months postpartum. Although reported couple functioning in the third trimester of pregnancy was concurrently associated with observed couple behavior, reported couple functioning was not a significant predictor of postpartum observed coparenting behavior. In total, the prenatal predictors accounted for 19% of the variance in observed supportive coparenting behavior and 14% of the variance in observed undermining coparenting behavior.

Discussion

This investigation was designed to test whether prenatal coparenting behavior, measured using the Prenatal Lausanne Trilogue Play (PLTP; Carneiro et al., 2006), forecasted postnatal coparenting behavior in a sample of dual-earner U.S. couples transitioning to parenthood. New parents' ability to establish successful coparenting relationships has important implications for subsequent child and family functioning (Schoppe-Sullivan et al., 2004; Teubert & Pinquart, 2010). However, researchers have disagreed regarding whether the coparenting relationship emerges prenatally (Feinberg, 2002) or immediately after the birth of the first child (Van Egeren & Hawkins, 2004). Prior studies of the emerging coparenting relationship examining associations between perceptions (via self-reports) or representations (via interviews) of coparenting at the prenatal stage and postnatal observations of coparenting behavior (e.g., McHale et al., 2004; McHale & Rotman, 2007) have made it challenging to understand if coparenting or *precursors* to coparenting emerge prenatally. While reconciling the findings of self-report and observational measures remains a significant challenge for family psychology research (Lorenz et al., 2007), understanding if prenatal coparenting emerges at a behavioral level has significant implications for interventions targeting family functioning, as problematic coparenting interactions could be ameliorated before the child is born.

Findings indicated that prenatal coparenting behavior was predictive of observed coparenting behavior at 9 months postpartum, over and above prebirth couple relationship functioning. This study expanded on the only other published study that used the PLTP in the U.S. and reported associations between prenatal coparenting behavior and fathers' self-reports of postnatal coparenting (Schoppe-Sullivan et al., 2013). Thus, the current study was not only the first to demonstrate the validity and utility of the PLTP as a window into the development of coparenting behavior, but it also corroborated the theoretical proposition that the coparenting relationship is distinct from the couple relationship and develops at the *behavioral* level prior to the child's birth (Feinberg, 2002). Moreover, this work lends

support to prenatal coparenting interventions (e.g., Feinberg & Kan, 2008) as these data indicate that persistent coparenting interaction patterns may be established before the child is born.

Although prior research has linked prenatal perceptions and representations of coparenting to postpartum coparenting behavior (McHale et al., 2004; Mchale & Rotman, 2007), and has connected prenatal coparenting behavior to postnatal family alliance (Carneiro et al., 2006; Favez et al., 2013), this is the first study documenting continuity between prenatal and postnatal coparenting behaviors. Even after controlling for both observed couple behavior and reported relationship functioning, partners who engaged in higher quality prenatal coparenting behavior in the PLTP showed greater supportive coparenting and less undermining coparenting behavior at 9 months postpartum. Notably, observed prenatal coparenting and couple behavior were associated, and observed couple behavior also made significant contributions to postpartum coparenting behavior. Thus, even before the child's birth, expectant parents already demonstrated particular interaction patterns in their roles as parents, and these behaviors were associated with but distinct from the ways they operated within their couple relationship. Yet, both the "couple" and emerging "coparenting couple" contributed to the development of coparenting behavior.

This research has helped to bridge Swiss and U.S. scholarship on the development of the family system and shows how these traditions that have focused on distinct constructs (family alliance vs. coparenting) complement and extend one another. Whereas theory and research on the family alliance has focused on family-level (mother-father-child) interactional processes, theory and research on coparenting has focused on interactions between parents in their roles as joint caregivers, stressing the importance of supportive and undermining behavior (Feinberg, 2003). Although the coparenting relationship, as the family's "executive subsystem," is part of the family alliance, measures of postnatal family alliance quality fail to adequately capture the critical dimensions of coparenting – supportive and undermining behavior – that have been most consistently linked to child outcomes (Teubert & Pinquart, 2010). In particular, the family alliance coding system (see Frascarolo, Favez, Carneiro, & Fivaz-Depeursinge, 2004) does not adequately capture undermining behavior, or criticism and competition between parents, which has been associated with declines in the quality of the couple relationship and poor behavioral adjustment in children (McHale & Rasmussen, 1998; Schoppe-Sullivan et al., 2004). Thus, the links established in the current study between prenatal coparenting behavior and validated measures of postpartum supportive and undermining coparenting behavior represent a step forward. At the same time, however, the PLTP coding system should be further expanded to explicitly capture undermining as well as supportive prenatal coparenting behaviors.

These findings also have implications for practice. Prior research (Feinberg & Kan, 2008; Feinberg, Kan, & Goslin, 2009) has shown that interventions to improve the coparenting relationship across the transition to parenthood, i.e., consisting of both pre- and postnatal sessions, can positively impact child and parent well-being as well as the coparenting relationship up to a year post-birth. If even without the active contributions of the child expectant parents have already begun to develop stable patterns of interaction in their roles as parents, interventions targeted specifically at the prenatal period may help establish more

cooperative and supportive coparenting interactions before the infant joins the union. In addition, the PLTP has the potential to serve as a clinical tool to provide expectant parents with video feedback regarding their coparenting interactions (Rusconi-Serpa, Rossignol, & McDonough, 2009). Previous research has shown that a high quality couple relationship may not shield the coparenting relationship from the detrimental effects of children with more difficult temperaments (Cook, Schoppe-Sullivan, Buckley, & Davis, 2009); thus, intervention with tools like the PLTP may offer an additional avenue to establish positive coparenting before a child, particularly one that may be more challenging, is present.

Even though this study has important implications for research and practice, there were also limitations. Although this research has helped to establish the validity and potential utility of the PLTP in the U.S., the sociodemographic characteristics of our dual-earner sample were not representative of the U.S. population, thus limiting generalizability. Future research should test the PLTP in other groups of expectant couples such as low-income, cohabiting couples and same-sex couples. In addition, the modest reliability of the DAS measure may have attenuated associations between self-reports of couple relationship functioning and postpartum coparenting behavior, which may have reached statistical significance had we used a stronger measure of couple relationship adjustment. Moreover, while the significant associations between coparenting behaviors across the transition to parenthood were impressive given the one year span of time – the effect sizes obtained were modest and other unmeasured variables certainly contribute to postpartum coparenting behavior. In fact, in the PLTP, the doll could not influence the interaction (e.g., by crying or cooing, etc.), but child behavior does play a role in coparenting behavior (e.g., Cook et al., 2009). Thus, future research should examine the role of child characteristics in continuity and discontinuity between prenatal and postpartum coparenting behavior. Finally, subsequent research with more frequent assessments of prenatal and postnatal coparenting behavior and couple relationship functioning may be better positioned to test more complex and nuanced models.

Notwithstanding these limitations, this study revealed the capacity for expectant parents' coparenting behaviors during the PLTP, a very brief procedure, to predict postpartum coparenting behavior approximately one year later, and highlights the importance of the prenatal period for the development of the coparenting relationship. In addition to the importance of a strong couple subsystem prior to the transition to parenthood (Schoppe-Sullivan & Mangelsdorf, 2013), establishing high quality coparenting behavior in the prenatal period may increase the likelihood that when children arrive they will be embedded in the warm, cooperative family environments that will best support their positive development.

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Figure 1.

SEM of prenatal coparenting behavior, observed couple behavior, and reported couple functioning predicting observed coparenting behavior at 9 months postpartum. M = Mother; F = Father; IntParent = Intuitive Parenting; Global = Global Interaction Quality; NegEsc = Negative Escalation; ProbSolv = Problem Solving; DAS = Dyadic Adjustment; NINT = Negative Interaction. * $p < .05$ ** $p < .01$; dotted lines indicate non-significant paths. Errors and disturbance terms not depicted.

Table 1

Intercorrelations among and Descriptive Statistics for Prenatal Coparenting Behavior, Observed Couple Behavior, and Reported Couple Functioning

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Prenatal Coparenting Behavior														
1. Cooperation														
2. Playfulness	.66**													
3. Family Warmth	.64**	.60**												
4. M Intuitive Parenting	.42**	.52**	.41**											
5. F Intuitive Parenting	.36**	.49**	.37**	.54**										
Observed Couple Behavior														
6. Global Interaction Quality	.13	.14	.22**	.08	.04									
7. Negative Escalation	-.12	-.06	-.13	-.08	.01	-.60**								
8. Cohesiveness	.15	.14	.22**	.09	.07	.87**	-.48**							
9. M Problem Solving	.10	.10	.08	.08	.01	.60**	-.34**	.58**						
10. F Problem Solving	.17*	.16*	.18*	.12	.17*	.70**	-.38**	.67**	.61**					
Reported Couple Functioning														
11. M Dyadic Adjustment	.14	.05	.18*	.02	.08	.30**	-.23**	.30**	.09	.17*				
12. F Dyadic Adjustment	.04	-.01	-.01	-.13	-.01	.24**	-.24**	.22**	.09	.21**	.40**			
13. M Negative Interaction	.03	.00	-.05	.05	-.01	-.21**	.22**	-.20*	-.02	-.11	-.55**	-.36**		
14. F Negative Interaction	.02	.13	.04	.13	.03	-.15	.13	-.19*	-.06	-.10	-.28**	-.45**	.51**	
Descriptive Statistics														
Mean	4.20	3.99	4.23	3.82	3.22	5.04	1.47	3.59	3.22	3.03	5.60	5.50	1.58	1.61
SD	1.06	1.17	.96	.95	.96	1.36	.87	.88	.91	1.09	.44	.49	.41	.46

Note. Ns vary from 167 to 180 as a function of missing values.

M = Mother; F = Father;

.10' > d'
**
50' > d'
*

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Table 2
Intercorrelations among and Descriptive Statistics for Observed Coparenting Behavior at 9 Months Postpartum

	1.	2.	3.	4.	5.	6.
Observed Supportive Coparenting						
1. Cooperation						
2. M Pleasure	.75**					
3. F Pleasure	.77**	.81**				
Observed Undermining Coparenting						
4. Competition	-.70**	-.55**	-.51**			
5. M Displeasure	-.60**	-.52**	-.48**	.66**		
6. F Displeasure	-.66**	-.49**	-.58**	.65**	.59**	
Descriptive Statistics						
Mean	7.77	7.44	7.12	3.29	3.13	3.12
SD	1.73	1.83	1.91	1.36	1.30	1.47

Note. $N = 153$.

M = Mother; F = Father.

* $p < .05$

** $p < .01$.

Correlations of Prenatal Coparenting Behavior, Observed Couple Behavior, and Reported Couple Functioning with Observed Coparenting Behavior at 9 Months Postpartum

Table 3

	Supportive Coparenting Behavior			Undermining Coparenting Behavior		
	Cooperation	M Pleasure	F Pleasure	Competition	M Displeasure	F Displeasure
Prenatal Coparenting Behavior						
Cooperation	.19*	.14	.14	-.13	-.19*	-.14
Playfulness	.25**	.17*	.18*	-.17*	-.16	-.17*
Family Warmth	.20*	.17*	.20*	-.12	-.10	-.06
M Intuitive Parenting	.21**	.16	.15	-.09	-.19*	-.16*
F Intuitive Parenting	.21**	.18*	.22**	-.14	-.17*	-.23**
Observed Couple Behavior						
Global Interaction Quality	.30**	.20*	.26**	-.24**	-.21*	-.18*
Negative Escalation	-.19*	-.12	-.15	.16	.12	.17*
Cohesiveness	.29**	.19*	.27**	-.21*	-.25**	-.18*
M Problem Solving	.13	.04	.12	-.06	-.14	-.08
F Problem Solving	.31**	.24**	.30**	-.26**	-.26**	-.20*
Reported Couple Functioning						
M Dyadic Adjustment	.22**	.10	.09	-.21*	-.01	-.10
F Dyadic Adjustment	.14	.03	.08	-.18*	-.16	-.07
M Negative Interaction	-.19*	-.25**	-.13	.22**	.12	.04
F Negative Interaction	-.10	-.12	-.14	.06	.12	.11

Note. *N*s vary from 141 to 151 as a function of missing values.

M = Mother; F = Father;

* $p < .05$

** $p < .01$.