Infant Behavior and Development xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Infant Behavior and Development

journal homepage: www.elsevier.com/locate/inbede

Full length article

The Inconsolable Doll Task: Prenatal coparenting behavioral dynamics under stress predicting child cognitive development at 18 months

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ARTICLE INFO

Keywords:
Coparenting
Prenatal
Cognitive development
Doll simulator
RealCare Baby® II-Plus infant simulator

ABSTRACT

Studies have demonstrated that coparenting can be assessed prenatally through playful observational conditions, including simulated baby enactments. Regrettably, there is a lack of empirical research examining how prenatal coparenting under the emotional stress elicited by the distress of a simulated infant predicts children's cognitive development. The current longitudinal study introduces a novel procedure—the Inconsolable Doll Task—to assess prenatal coparenting behavioral dynamics under the stress of a non-responsive doll simulator, and examines the extent to which prenatal interaction patterns predict the child's cognitive development at 18 months. The sample consists of 105 community-based, co-living, expectant fathers and mothers. Data were collected prenatally, at three, six, and 18 months in home and lab visits. Results indicate that the prenatal coparenting dynamic of negative escalation explains a unique variance in children's cognitive development at 18 months. This effect is evident even when accounting for both prenatal and postnatal assessments of low-stress coparenting behavioral patterns or self-reported coparenting perceptions, and when controlling for parental education. These findings are discussed in terms of their methodical, empirical, and clinical implications.

1. Introduction

An examination of the child development field reveals exciting shifts moving from monadic to dyadic, and most recently, triadic conceptual and empirical approaches to child development. This shift corresponds with two central theories. The first is the ecological systems theory, according to which, development is a function of forces emanating from multiple settings and from the relations among these settings (Bronfenbrenner & Morris, 2006). The second is the transactional theory of development (Sameroff, 1975; Sameroff & Fiese, 2000), according to which there is a bidirectional influence in transactions between children and their environments that shape their development. The integration of these two theories implies that it is useful to study child development within multi-person family group dynamics, while taking into account the mutual influence of the different family members—including the child—on the child's developmental trajectory (Belsky, 1984; Belsky, Putnam, & Crnic, 1996; Bronfenbrenner, 1986; Cowan & Cowan, 2000; McHale, Kuersten-Hogan, & Rao, 2004). One facet of the family system is the coparenting unit.

Coparenting refers to the degree of collaboration, affirmation, and support between adults raising children for whom they share responsibility (Feinberg, 2003; McHale, 2007). Appreciating the importance of coparenting patterns, studies have been able to successfully activate the coparenting system even prior to the baby's birth through self-reports and interviews (e.g., McHale & Rotman, 2007). Researchers were even able to activate the family dynamics in a playful situation using a doll simulating the unborn

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https://doi.org/10.1016/j.infbeh.2018.04.003
Received 5 September 2017; Received in revised form 27 March 2018; Accepted 9 April 2018
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baby (e.g., Favez, Frascarolo, Lavanchy Scaiola, & Corboz-Warnery, 2013). Nonetheless, infants often present parents with stressful situations, such as when the baby cries inconsolably.

Attempting to capture a fuller understanding of coparenting and its impact on child development, this study sought to assess observed prenatal coparenting under conditions that might evoke stress in parents, namely, a doll simulating an inconsolable baby that expectant parents were asked to care for and soothe. The research was designed to investigate whether these prenatal coparenting patterns under stress could account for individual differences in the child's development at 18 months, even when considering assessments of prenatal and postnatal coparenting family dynamics under low emotional arousal or coparenting perceptions.

1.1. Coparenting

Throughout history and around the world, one of the essential tasks identified with adulthood is parenting young children, in most cases, within a coparenting system. According to Minuchin's (1974) theory of family structure, the family system is headed by the coparenting relationship, or the "executive subsystem," which is related to but distinct from the preexisting relationship between the partners (Altenburger, Schoppe-Sullivan, Lang, Bower, & Kamp Dush, 2014; Schoppe-Sullivan, Mangelsdorf, Frosch, & McHale, 2004). Coparenting is concerned principally with the degree of collaboration, affirmation, and support between adults raising children for whom they share responsibility (Feinberg, 2003; McHale, 2007). Given the focus on the shared aim of rearing the child (Burney & Leerkes, 2010), coparenting includes only the aspects of the marital relationship that are relevant for parenting (Abidin, 1992; Feinberg, 2003; Katz & Gottman, 1996; McHale & Rasmussen, 1998). At its core, coparenting is a triadic structure involving the coordination of two adults responsible for the caring, education, and nurturing of their children (McHale, Kazali et al., 2004; McHale, Kuersten-Hogan et al., 2004), as well as the extent to which the parents support or undermine each other's parenting efforts (Belsky, Woodworth, & Crnic, 1996).

Irrespective of its operationalization (self-reports, observations, or interviews), coparenting has been shown to impact children's development, psychopathology, and adjustment at different ages (Teubert & Pinquart, 2010). For example, self-reported coparenting communication, conflict, and shared decision-making when the child was 24-months-old was directly linked to children's math, literacy, and social skills at 48 months (Cabrera, Scott, Fagan, Steward-Streng, & Chien, 2012). Similarly, supportive coparenting predicted better social skills and attention, less passivity and dependence, and higher grades in the classroom in the following year (Dopkins Stright & Neitzel, 2003).

In terms of socio-emotional difficulties, studies relying both on self-reports and observational assessments of coparenting quality have shown that children growing up in families experiencing disruptions in coparenting exhibit higher levels of externalizing behavior problems in the second year of life (Belsky, Putnam et al., 1996; Belsky, Woodworth et al., 1996; Jacobvitz, Hazen, Curran, & Hitchens, 2004; Jones, Shaffer, Forehand, Brody, & Armistead, 2003; Schoppe, Mangelsdorf, & Frosch, 2001; Schoppe-Sullivan, Weldon, Claire Cook, Davis, & Buckley, 2009), less prosocial behavior (Scrimgeour, Blandon, Stifter, & Buss, 2013), and inhibition difficulties as early as 18 months (Belsky, Putnam et al., 1996; Belsky, Woodworth et al., 1996; Lindsey & Caldera, 2005).

There is also evidence that coparenting is related to parent-child and family relationships (McHale & Rasmussen, 1998). In a longitudinal study, the perceived absence of coparenting cooperation predicted an increase in negative child-to-mother behavior and negative child-to-father behavior between 18 and 24 months (Floyd, Gilliom, & Costigan, 1998). Brown, Schoppe-Sullivan, Mangelsdorf, and Neff (2010) found that children from families exhibiting higher levels of observed supportive coparenting in early infancy were more likely to be securely attached to their fathers (but not mothers) at 13 months of age. Taken together, these findings clearly demonstrate that acrimonious parental interactions and disagreements about childrearing can be detrimental to young children's development (Feinberg, Kan, & Hetherington, 2007).

In contrast to the body of work demonstrating associations between coparenting and children's socio-emotional development, little is known about the impact of coparenting on children's cognitive functioning. Favez et al. (2012) documented the influence of observed coparenting and family alliance in a playful interaction in the first two years of children's cognitive development at the age of five years. Relatedly, Jacobvitz et al. (2004) found that observed hostile family interactions in a nonclinical sample of toddlers forecasted the development of ADHD in middle childhood. However, to the best of our knowledge, there is little research addressing the possible impact of the quality of coparenting on children's cognitive development. One of the goals of this study is to address this question as early as possible, namely, in the prenatal phase.

1.2. Prenatal coparenting

Appreciating the significance of coparenting dynamics for child development, researchers have aimed to identify coparenting patterns as early as possible, and examine whether coparenting could be assessed reliably even prenatally. Doing so would inform early intervention and perhaps even prevention programs geared to enhance child development (Altenburger et al., 2014; Feinberg, 2003). To that end, and using a variety of assessments, researchers attempted to document associations between prenatal and postnatal coparenting interactions.

One way to explain the continuity between prenatal and postnatal coparenting dynamics is via the parents' mental representations of coparenting that form during pregnancy and perhaps even earlier. These mental representations involve various aspects of family processes, including expectations of the degree of harmony vs. conflict, support, and endorsement vs. undermining that will be experienced in the coparenting relationship. Consequently, parental representations of coparenting involve cognitive facets of the coparenting relationship such as the caregivers' perceptions of the overall quality of their coparenting relationship, and appraisals and anticipations of their own and their partners' specific coparenting behaviors. These prenatal representations of the future

coparenting relationship are hypothesized to be associated with their postpartum coparenting relationship (Kuersten-Hogan, 2017).

Researchers have often used questionnaires to capture the cognitive facts of the coparenting relationship. McHale and Rotman (2007) used Cowan and Cowan's "Ideas About Parenting" questionnaire (IAP) in pregnancy, which contains 46 different child-rearing items, to assess discrepancies in the scores between fathers' and mothers' parenting ideas. McHale and Rotman (2007) found that larger discrepancies between partners' parenting beliefs during the third trimester of pregnancy predicted less overall coparenting solidarity (high in cohesion and low in conflict) at both 3 and 12 months on the LTP (LTP; Fivaz-Depeursinge & Corboz-Warnery, 1999) and Still-Face Paradigm (SFP; Tronick & Gianino's, 1986).

One technique for obtaining self-reports about perceptions about the quality of coparenting is the Coparenting Relationship Scale (CRS; Feinberg, Brown, & Kan, 2012), whose postpartum version we adapted to create prenatal coparenting self-report measures. The CRS provides a rich and multidimensional assessment of the perceptions and attitudes towards coparenting including endorsement, undermining, agreement, support, division of labor, and closeness.

Attempting to obtain a fuller understating of expectant parents' coparenting views and attitudes, McHale and colleagues (McHale, Kazali et al., 2004, McHale, Kuersten-Hogan et al. (2004) and McHale and Rotman, 2007) developed the prenatal Coparenting Interview, in which participants reflected on their own parents' coparenting relationship, and on their expectations for the coparenting relationship they would soon begin forming with their partner. The researchers reported that when negative outlooks and expectancies colored the future parents' representations, coparenting cohesion at 3 months and coparenting solidarity at 12 months were lower than in other families. In addition, they found that between-parent differences in parenting beliefs evident during pregnancy predicted the extent of postnatal solidarity (McHale, Kazali et al., 2004; McHale, Kuersten-Hogan et al., 2004; McHale & Rotman, 2007).

Researchers have also used the Who Does What discussion (WDW), based on Cowan and Cowan's (1988) self-reported questionnaire "Who Does What" (Elliston, McHale, Talbot, Parmley, & Kuersten-Hogan, 2008; Schoppe-Sullivan et al., 2004) to examine the level of agreement between partners' coparenting representations more dynamically. Initially, each parent individually completes the 24-item WDW list of childcare roles (e.g., diapering, feeding), and rates how much of each item is their or their partner's responsibility. After completing the questionnaire independently, partners are asked to share their responses and reach consensus on each item. Research shows that expectant parents' perceptions and beliefs about expected and ideal childcare responsibilities predicted their postpartum representations and functioning of coparenting at 3 and 12 months (Kuersten-Hogan, 2017).

To assess coparenting prenatally on a behavioral level, researchers developed the prenatal LTP (PLTP; Carneiro, Corboz-Warnery, & Fivaz-Depeursinge, 2006), a semi-standardized paradigm used extensively to assess prenatal family alliance and coparenting in a playful, low-stress context, in which parents are asked to play out an encounter with their child, simulated by a fabric doll (with a baby's body, but without distinct facial features) (Carneiro et al., 2006; Corboz-Warnery & Fivaz-Depeursinge, 2001; Fivaz-Depeursinge, Frascarolo-Moutinot, & Corboz-Warnery, 2010). Beyond the role-playing abilities, the task calls on the parents' mutual support of and cooperation with each other as parents (Carneiro et al., 2006).

Using the PLTP, Favez et al. (2013) demonstrated that the interactive qualities necessary for mother–father–infant coordination could even be detected during pregnancy. Specifically, they found that a couple's cooperation in the prenatal playful PLTP was correlated with almost all dimensions of postnatal play at 3 and 18 months. Furthermore, warmth and intuitive parenting were also correlated with several postnatal dimensions, as well as with the child's emotional and behavioral wellbeing (Carneiro et al., 2006; Favez et al., 2012, 2013).

The variety of methods designed to assess coparenting suggests its multifaceted nature, composed of cognitions, expectations, and behaviors – while considering the different aspects of the relationship, as well as its manifestation in various contexts. One question that arises pertains to the extent to which the different aspects of prenatal coparenting correspond with each other. Regrettably, data addressing this issue are only now accumulating and are currently inconclusive. Recently, Kuersten-Hogan (2017) was the first to explore cognitive as well as behavioral facets of the prenatal coparenting relationship simultaneously and found no correlation between prenatal coparenting representations and behaviors. One possibility for this lack of association is that parental coparenting behaviors were measured within a low emotional arousal context. Perhaps representations of prenatal coparenting correspond more with behavioral coparenting during high emotional arousal states. It is possible that reports of coparenting may be more consistent with observed behavior during stressful rather than relaxed coparenting interactions.

1.3. Coparenting and stress

The findings pertaining to the PLTP clearly demonstrate the importance of positive, playful, and supportive coparenting for subsequent family dynamics and a child's emotional development. Unfortunately, the desire to answer a young child's immediate and demanding needs, which are expressed nonverbally and are often hard for parents to interpret, can be difficult and stressful.

From an ecological perspective, one of the sources that influences parental functioning, including coparenting, is the amount of stress or support the parent experiences (Belsky, 1984). Indeed, the impaired functioning of various dimensions of coparenting is associated with higher levels of parenting stress (Margolin, Gordis, & John, 2001; Shai, Dollberg, & Szepsenwol, 2017). Conversely, well-functioning coparenting systems can reduce parental stress. In fact, coparenting has been conceptualized as a significant component of parenthood on which partners can rely for support when stressed by the many frustrations of parenting (Weissman & Cohen, 1985). The risk of engaging in emotionally unsupportive coparenting is most likely to surface when families face greater stress in the form of daily aggravations (Belsky, Crnic, & Gable, 1995). This is especially true when considering the coparenting of younger children, who, compared with older children, may require more cooperation and teamwork to meet the moment-to-moment demands of parenting young children (Margolin et al., 2001) and keeping parental stress at bay (Durtschi, Soloski, & Kimmes, 2017).

Fascinating work has been conducted investigating the impact of coparenting under stressful conditions on child development. Brown et al. (2010), for example, gave parents of 3.5 month-old infants a "onesie" and asked them to change the infant into this outfit together. According to the researchers, this task was designed to assess coparenting behavior during a joint child care task, a situation that is arguably more stressful than triadic free play (see also Schoppe-Sullivan, Mangelsdorf, Brown, & Sokolowski, 2007).

Moreover, and in line with the transactional model (Sameroff, 1975), the infant itself is sometimes the source of stress and strain on the coparenting unit. Cook, Schoppe-Sullivan, Buckley, and Davis (2009) found that children's negative affect was a significant predictor of undermining coparenting, such that more temperamentally difficult children had parents who undermined each other's parenting more frequently and intensely. These findings also underscore the importance of including the child, or the represented child, in the coparenting assessment, because the child's presence and his or her level of arousal activate and challenge the functioning of the coparenting.

We believe that the well-documented influence of coparenting on child development stems, at least to some extent, from what the child is exposed to, on the behavioral level, in the family dynamics. Furthermore, we contend that the significance of the coparenting alliance in terms of its impact on the child is at its peak when the coparenting alliance is challenged in times of tension, difficulty, or disagreement between the parents who also need to consider their child's wellbeing in their actions. Indeed, there is work suggesting that a significant portion of marital conflict takes place in the presence of children (Papp, Cummings, & Goeke-Morey, 2002), and that marital and parental conflict can "spill over" to the parent-child subsystem, thereby influencing the child's development (Katz & Gottman, 1996; Kitzmann, 2000).

Taken together, we argue that in an ecologically valid measurement of prenatal coparenting dynamics that taps into how coparenting patterns actually influence the child's developmental trajectory should simultaneously meet two criteria: a) including the represented infant in the assessment, and b) activating and challenging the coparenting alliance.

To the best of our knowledge, researchers have investigated prenatal coparenting dynamics meeting one of these criteria, but not both integrated within one study. Some studies used a task designed to activate and challenge the coparenting system, but did so in the absence of a representation of the infant (e.g., Cowan & Cowan, 1990; Kuersten-Hogan, 2017; McHale, Kazali et al., 2004; McHale, Kuersten-Hogan et al., 2004; McHale & Rotman, 2007; Schoppe-Sullivan et al., 2004), while other studies included the represented infant during a playful coparenting interaction, but not in one designed to challenge the coparenting alliance (e.g., Carneiro et al., 2006; Corboz-Warnery & Fivaz-Depeursinge, 2001; Favez, Frascarolo, & Fivaz-Depeursinge, 2006; Favez et al., 2012, 2013; Fivaz-Depeursinge et al., 2010).

1.4. The current study

To fill this gap in the literature, we designed a study to simulate a prenatal coparenting high-arousal and stressful behavioral task using the RealCare Baby® II-Plus infant simulator. Our goal was to create a realistic, high-arousal context in as ecologically valid a way possible to illuminate how the presence of an inconsolable infant affects coparenting dynamics and the child's development. More specifically, the aim of the study was twofold. First, we aimed to establish convergent validity for the newly developed Inconsolable Doll Task (IDT). With this goal in mind, we examined concurrent associations of coparenting dynamics with behavioral family alliance dynamics (LTP; Corboz-Warnery & Fivaz-Depeursinge, 2001), behavioral spousal support (Collins & Feeney, 2000), and self-reported coparenting (CRS; Feinberg et al., 2012). Second, we sought to expand our understating of how coparenting impacts children's cognitive development and establish the procedure's predictive validity. To that end, the current work was designed to examine the extent to which prenatal coparenting dynamics predict the child's cognitive development at 18 months (Mullen Scales of Development; Mullen, 1995). To address the possibility that infants' cognitive development results from either heredity or general environmental influences (e.g., Rowe, Jacobson, & Van den Oord, 1999; Van Bakel & Riksen-Walraven, 2002) rather than coparenting per se, we controlled for parents' education when predicting children's cognitive functioning from prenatal coparenting dynamics.

Therefore, we constructed three hypotheses:

H1. Prenatal coparenting behavior will be positively associated with self-reported coparenting quality. Specifically, supportive coparenting detected during the Inconsolable Doll Task will be positively correlated with self-reported supportive co-parenting assessed by self-reported coparenting perceptions.

H2. Prenatal coparenting dynamics under high-arousal conditions will be associated with prenatal and postnatal coparenting quality under low-arousal conditions. Specifically, supportive coparenting identified during the Inconsolable Doll Task will be positively associated with coordinated family alliance behavioral dynamics assessed both prenatally and postnatally.

H3. Supportive coparenting behavior detected during the Inconsolable Doll Task will predict various aspects of the child's cognitive development at 18 months, above and beyond the influence of the parents' education levels.

2. Method

2.1. Participants

One hundred and five Israeli families participated in this longitudinal study of co-habiting heterosexual couples expecting their first child. All mothers were in their third trimester (M = 29.7 weeks, SD = 2.55 range = 22.27–37.08 weeks). Families were

recruited through Internet advertisements, flyers, and medical centers, and were paid 250 Israeli shekels (about $72.00 at the time) for their participation in the prenatal phase. All parents were fluent in writing and speaking Hebrew, middle to upper class, and lived in central Israel. The mothers' mean age was 30.82 (*SD* = 3.63, range = 23–42) and the fathers' mean age was 32.41 (*SD* = 4.01, range = 23–42). None of the parents reported at-risk pregnancies or known neurological or psychological disorders. The average number of years of education was 15.36 years (*SD* = 2.41) for the fathers and 16.3 years (*SD* = 2.10) for the mothers. In the third phase of the study, infants were 27.98 weeks old (range 20.78–42.76 weeks, *SD* = 6.71), and 55 of them were boys (55.75%).

2.2. Measures

2.2.1. Coparenting behavioral dynamics under stress

The Interactional Dimensions Coding System (IDCS; Julien, Markman, & Lindahl, 1989) was used to assess coparenting behavioral dynamics under stressful conditions in the Inconsolable Doll Task (IDT). The coding system examines an array of communicative behaviors that express a range of capabilities, including self-control, self-acceptance, as well as the ability to recognize the other and his or her feelings, the ability to present emotional content, and the use of positive or negative dyadic communicative techniques. The coding system includes both individual and interactional (dyadic) dimensions. Since the focus of the current study was coparenting dynamics, only the dyadic variables were considered.

The interactional dimension carefully scrutinizes the dyadic behavioral attempts to generate supportive or conflictual verbal and nonverbal communication between the parents and regulation strategies in stressful and conflictual contexts. Since the focus of the current investigation was the couple's ability to come together in light of the stress evoked by the inconsolable simulated baby and work together as a team, we chose the IDCS coding system. We maintain that it was the most appropriate tool for capturing the couple's ability to cope with and regulate their coparenting interactions under stressful conditions. To ensure the specific assessment of coparenting dynamics rather than marital or spousal ones, we coded only the communications and exchanges pertaining to the care of the inconsolable baby.

The interactional dimension includes four scales: (1) *Negative escalation*, which refers to the extent to which destructive communication and negative affect are reciprocated between partners. An example of high negative escalation is the following scenario. As the expectant mother enters the room in which the expectant father is with the inconsolable baby, the expectant father says to her, "Your child eats a lot!" The mother exclaims, "My baby?!? And what, when he is calm, he is your baby?" (2) *Dominance,* which assesses the asymmetries in spousal control over the interaction. An example of dominance would be an expectant father holding the baby simulator and the expectant mother constantly touching the baby, removing the blanket from it without consulting with the father. Even though the father is holding the baby, there is a strong sense of maternal gatekeeping. Physically the mother does not move away from the father and the baby, and does not allow the father to freely explore his attempt at soothing the inconsolable baby. (3) *Editing* refers to asymmetries in the attempts spouses make to prevent negative escalation. An example of editing is a situation in which as soon as the expectant father passes the inconsolable baby to the expectant mother, the doll stops crying, as it is programmed to do a priori. The mother, in response to the coincidental silence (of which she is, of course, unaware) following the passing of the doll to her, says, "Oops, I think I killed her; yep, I killed her." To that, the expectant father replies, "I think she is all alright. She is fine." (4) *Interactional synchrony*, which denotes the extent to which the partners demonstrate harmony and coordination in their interaction. An example of a highly synchronized coparenting interaction would be a couple who works together to try and console the baby, listens to and responds to the suggestions of one another, and thinks together about possible solutions. Another example of a highly synchronous coparenting interaction is the expectant father holding the doll/baby, slowly swaying from side to side, and the expectant mother approaching the dad and caressing him from behind to join their rhythmic movement.

Ratings each of these four mutually exclusive scales were made on a 9-point Likert-type scale ranging from *very low* (1) to *very high* (9). Each interaction was divided into three equal segments coded separately and averaged into a mean score on each dimension. The interactions were coded by three trained coders blind to all other aspects of the study. The ICC for negative escalation was 0.89; 0.93 for dominance; 0.73 for editing, and; 0.85 for synchrony. The IDCS has previously demonstrated discriminant validity, as well as its strength as a predictor of marital distress over time (Bouthillier, Julien, Dubé, Bélanger, & Hamelin, 2002; Julien et al., 1989).

2.2.2. Self-reported coparenting

The Coparenting Relationship Scale (CRS; Feinberg et al., 2012) is a multi-domain self-report questionnaire used to evaluate parental perceptions regarding coparenting relationships. We modified it to assess the prenatal representations of coparenting. The modification included asking the parents to state their ideas and perceptions regarding their future coparenting relationship, once the baby was born. Therefore, the statements were in the future tense. Additionally, the sub-scale of "Exposure to Conflict" was removed due to lack of relevance to the pregnancy period. The prenatal version included 30 items, divided into six sub-scales. The sub-scales were: "Coparenting agreement" – whether parents' views of how to rear a child are similar (i.e., "My partner and I will have the same goals for our child"); "Coparenting closeness" – shared celebration of the child's attainment of developmental milestones, the experience of working together as a team, and witnessing one's partner develop as a parent (i.e., "My relationship with my partner will be stronger than before we had a child"); "Coparenting support" – affirmation of the other parent's competency as a parent, acknowledging and respecting the other's contributions, and upholding the other's parenting decisions and authority (i.e., "My partner will ask my opinion on issues related to parenting"); "Coparenting undermining" – undermining the other parent with criticism, disparagement, and blame (i.e., "It will be easier and more fun to play with the child alone than it will be when my partner is present too"); "Endorse partner parenting" (i.e., "My partner will be sensitive to our child's feelings and needs"); and "Division of labor" – the division of childrearing labor between parents (i.e., "My partner will like to play with our child and then leave all the dirty work to

me").

Ratings were made on 7-point Likert-type scales ranging from *Not true of us* (1) to *Very true of us* (7). High scores on the agreement, closeness, support, endorse, and division scales reflected a more positive coparenting relationship. In contrast, a high score on the undermining scale reflected a more negative coparenting relationship. We used the global CRS score, which is the mean of all of the items. Cronbach's alpha for internal consistency for both the fathers' and mothers' global CRS scores was 0.91 and 0.92 for the prenatal and postnatal assessments, respectively.

2.2.3. Prenatal family alliance

The prenatal alliance was assessed using the coding system for the prenatal LTP task (Prenatal LTP; Carneiro et al., 2006). The coding system includes five scales: (1) coparental playfulness toward the task (ability of the couple to create a playful space and co-construct the game), (2) structure of the play (their ability to structure the play in four parts according to the instructions and to give sufficient time for the play to be established), (3) intuitive parenting behaviors (such as baby talk, for example), (4) couple's co-operation (degree of cooperation achieved by the couple during the play), and (5) family warmth (positive bond and mood between partners during play). Each scale utilizes a 5-point Likert-type rating system ranging from 1 *(inappropriate)* to 5 *(appropriate)*, with higher scores indicating more positive familial interactions. In accordance with previous studies, we computed a global score of prenatal alliance ranging between 5 and 25, with higher scores reflecting the positive qualities of coparenting playfulness, structure of the play, intuitive parenting behaviors, couples' cooperation, and family warmth. Cronbach's alpha for internal consistency was 0.78.

2.2.4. Postnatal family alliance

Postnatal alliance was assessed using the Family Alliance Assessment Scale (FAAS; Lavanchy Scaiola, Favez, Tissot, & Frascarolo, 2008) to analyze the postnatal Lausanne Trilogue Play (Postnatal LTP; Fivaz-Depeursinge & Corboz-Warnery, 1999). The FAAS is a global scale that evaluates the family as a whole. This scale is built on four hierarchically interactive functions, namely, (1) Participation: (a) contextual (correct positioning of the child and timing of the play), (b) corporal (parents' pelvises and torsos oriented toward the child), and (c) visual (each partner can see the other in his or her peripheral vision); (2) Organization: (a) corporal (distance between partners is appropriate for dialogue), and (b) visual (the three partners' faces are oriented toward each other); (3) Focalization: the three partners co-construct a common play; and (4) Affect sharing: mutual expressions of emotions between the partners. An additional aspect coded is the way in which the family manages to repair interactive mistakes (with two sub-scales). Additionally, there is consideration of coparenting (two sub-scales) and child involvement (two sub-scales). Each scale utilizes a 5-point Likert-type rating system ranging from 1 *(inappropriate)* to 5 *(appropriate)*. The sum of these scales represents the quality of the family triad, and ranges between 15 and 75 points. Higher scores reflect a more positive family alliance and dynamics. Cronbach's alpha for internal consistency was 0.91.

2.2.5. Child development

The Mullen Scales of Early Learning (MSEL; Mullen, 1995) assessment was used to capture the child's cognitive, fine motor, and receptive and expressive language developed at 18 months. The MSEL is a comprehensive measure of cognitive functioning for infants and preschool children from birth through 68 months administrated to the child by trained psychologists. It is composed of four cognitive scales (visual reception, fine motor, receptive language, and expressive language) and one gross motor (not included in the current inquiry). The four cognitive scales can be combined to produce an Early Learning Composite (ELC) that is said to represent "g" or "general intelligence." The MSEL has a theoretical basis in neurodevelopment and intra-sensory, inter-sensory learning that has proven to be a good construct and demonstrated criterion validity in a normative population (Mullen, 1995).

Each scale is composed of items that are developmentally appropriate and involve relevant materials. The more tasks the child completes and advances through, the higher the score, reflecting more advanced development. The scores of each scale are summed and standardized. The MSEL provides a normative and standardized general score ($M = 100$, $SD = 15$) based on standardized cognitive scales ($M = 50$, $SD = 10$). The MSEL was administrated by highly trained postgraduate students, who were trained by a certified developmental psychologist.

2.3. Procedure

This longitudinal study was comprised of four sampling times: prenatally (T1), 3 months (T2), 6 months (T3) and 18 months post-partum (T4). At T1, the couple was invited to the laboratory and was video recorded during the prenatal Lausanne Trilogue Play (LTP) and during the Inconsolable Doll Task (IDT). The infant simulator (RealCare Baby II-Plus; Realityworks, Eau Claire, WI, USA) used in the latter task is a doll resembling a real infant in physical appearance, size, and weight (2.95 kg). The doll is programmed as an infant with various realistic crying sounds, as well as breathing, burping, giggling, and suckling sounds. The physical features of the infant simulator are modeled in order to require real caring and nurturing. The doll was dressed according to the gender of the expected baby; pink for girls, blue for boys, and green for those who did not know or did not wish to share this information.

For the IDT, parents initially received instructions and were shown how to take care of the baby, and in response, how the doll responded to parental care and could be soothed. Specifically, the research assistant introduced the doll, which was crying softly, to the parents, saying: "This is your baby. As you can see and hear, it sounds just like a real baby, and it responds to different kinds of care. Now, we will try and figure out why it is crying." The research assistant demonstrated baby care by trying to rock and comfort the doll, covering it with blanket to make it feel warmer, playing with it, and finally feeding the doll. The doll stopped crying and

started to drink from the bottle, while the research assistant confirmed with a smile that it was hungry. Then, she laid down the baby doll in the basket and one of the parents was asked to stay with the doll (counterbalanced), while the other waited in the waiting room.

This procedure was designed to activate the coparenting dynamics under stressful conditions, with the aim of heightening the coparenting stress. We provoked distress in one parent and then measuring the extent to which the entry of the other parent into the room—in which the first parent was already distressed and in need of support—provided the coparenting dyad with an opportunity to coparent jointly and collaboratively. The other alternative was that the stress and strain would make it difficult for them to come together as parents and try to tackle the parenting problem they were facing.

As the research assistant left the room, she discretely programmed the doll's status to "non-responsive" to parental care, and began a 10-min task that consisted of two phases, each of 5 min. In phase one, only one parent stayed in the room with the distressed "infant" for 5 min (counterbalanced). In this phase, the doll was programmed to cry in a relative calm state for 20 s in order to allow the parents to become familiar with the "infant." Then, the doll began crying for 2 min and calmed down for 20 s, then cried for 2 additional minutes, followed by a temporary calming down. In phase two, the research assistant asked the other parent to join the first parent in the task of soothing the "infant" for 5 additional minutes. The doll was programmed in the same manner as in phase one. The doll's cry varied in pitch, volume, and duration to create an ecological infant cry stimulus to which the parents would not habituate.

To assess family alliance and coparenting under low-stress conditions, we used the Prenatal Lausanne Trilogue Play procedure, a 5-min, semi-standardized task in which parents are asked to play out an encounter with their child (Corboz-Warnery & Fivaz-Depeursinge, 2001; Fivaz-Depeursinge et al., 2010), simulated by a fabric doll (with a baby's body, but without distinct facial features). The prenatal LTP is an adaptation of the postnatal LTP that allows the observation and assessment of coparental co-ordination and alliance as it relates to the baby-to-be. Beyond role-playing abilities, the task calls on the parents' mutual support of and cooperation with each other (Carneiro et al., 2006).

Prior to the PLTP task, and following the PLTP research practice (Corboz-Warnery & Fivaz-Depeursinge, 2001; Fivaz-Depeursinge et al., 2010), the research assistant conducted a short interview with the parents regarding the pregnancy, their expectations about parenthood, and their future child. The purpose of the interview was to warm up the parents and increase their cooperation. Then, the parents were seated in a triangular configuration with a basket and were asked to imagine the moment when the three of them would meet for the first time after the delivery. The researcher explained that the task had four components. One of them would play with the "baby" and then the other one would do so. Then the parents would play together with him or her, and finally, they would let him or her "go to sleep" and then talk together about the experience they just had. The researcher helped them "warm up" by role-playing as the nurse bringing the baby to them (for a detailed description, see Carneiro et al., 2006). The task ended after exactly 5 min, when the researcher re-entered the room and announced that the task was over. Parents were debriefed at the end of the task. Note that because the IDT also involves hormonal reactivity measurements (that necessitate a 20-min wait after the procedure for post-task hormonal sampling) that are beyond the scope of this study, the PLTP was consistently administrated before the IDT.

In T3, families were observed in the postnatal LTP (for a detailed description of the procedure, see Fivaz-Depeursinge & Corboz-Warnery, 1999) during the lab visit and recorded by four cameras in different angles. The aim of the LTP is for the parents and the infant to play together and thus have fun and share a pleasurable moment (Favez, Frascarolo, & Tissot, 2017). During the LTP, families were asked to play together in four different configurations corresponding to the four possible combinations in a triad while on the mat: (1) One parent plays with the infant while the other parent is in a third-party position, as participant-observer; (2) The parents switch roles; (3) The three partners play together; (4) The parents have a discussion with each other, while the infant is the third party (Favez et al., 2017). This interaction did not include any toys, and the family played on the mat. Given that this study was part of a larger research project and the lab visit included more tasks, this adaptation followed a pilot where the 6-month-old infants had difficulty sitting in a high chair for a sustained length of time. This adaptation was confirmed and approved by the LTP team in Lausanne (F. Frascarolo, personal communication, 2016). The average duration of the Postnatal LTP was 9.89 min (SD = 86.33).

In T4, the MSEL was administrated during the home visit, in the presence of the mother and the child. The child was asked to sit in a child-size chair next to a table, and the researcher sat next to him or her. The items in the MSEL kit are standardized toys and objects (e.g., doll, blocks). Many items included a demonstration of the task being assessed by that item. The mother was requested to avoid actively helping the child, but to help keep his or her attention on the task. The interaction was video-recorded by a second researcher.

3. Results

3.1. Analysis plan

Analyses were conducted in several steps. First, a series of bivariate correlations were computed to document the strength of the associations between the observed prenatal coparenting dynamics under stress and the prenatal and postnatal (three and six months) self-reported perceptions of coparenting, as well as the coparenting behavioral dynamics under low stress, and parental education. Follow-up regression analyses were then conducted to determine whether the observed prenatal coparenting dynamics under stress predicted the child's development at 18 months above and beyond a) other prenatal coparenting assessments, and b) postnatal assessments of coparenting.

Table 1
Means, Standard Deviations, and Zero-Order Correlations between Study Variables and Coparenting Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. IDCS Negative Escalation	–																
2. IDCS Dominance	−.02	–															
3. IDCS Edit	.34**	.34**	–														
4. IDCS Synchrony	−.20†	−.38**	−.32**	–													
5. Prenatal Paternal CRS	−.16	−.10	−.15	.12	–												
6. Prenatal Maternal CRS	−.23*	−.18†	−.15	.21*	.45***	–											
7. Postnatal Paternal CRS	−.05	−.20†	−.20†	.25*	.72***	.43***	–										
8. Postnatal Maternal CRS	−.16	−.20†	−.13	.23*	.46***	.68***	.62***	–									
9. Prenatal LTP	−.17	−.16	−.18	.44***	.01	−.03	−.42	−.00	–								
10. Postnatal LTP	−.10	.01	.00	.31**	.05	.15	.12	.20†	.36***	–							
11. Paternal Education	.06	−.04	.18	.11	−.15	−.11	−.13	−.17	.01	−.06	–						
12. Maternal Education	.05	.08	.11	.13	.05	−.04	−.08	−.03	−.02	.07	.22*	–					
13. Visual Perception	−.31**	−.03	−.03	.06	.14	.01	.04	−.02	−.01	−.01	.07	.00	–				
14. Fine Motor Skills	−.19†	.07	−.00	.08	.03	.07	.01	−.01	.09	.25*	−.05	.08	.30**	–			
15. Receptive Language	−.26*	.00	−.07	.14	.11	.17	.10	.08	.16	.23*	.19†	.11	.33***	.23*	–		
16. Expressive Language	−.11	−.05	−.04	−.08	.01	.08	.05	.04	.08	.18	.00	.07	.28**	.25*	.56**	–	
17. Early Learning	−.31**	.00	−.07	.08	.11	.12	.08	.04	.14	.24*	.10	.09	.67***	.57***	.82***	.72***	–
Mean	2.26	4.46	3.49	5.40	4.78	4.89	4.98	5.01	3.62	19.52	15.12	15.93	51.65	45.69	50.89	47.87	195.55
SD	1.51	1.81	2.07	1.84	.65	.62	.62	.64	1.39	6.09	2.98	2.90	10.15	8.37	13.72	8.03	28.73

Note. IDCS = Interactive Dyadic Communication Scale. CRS = Coparental Relationship Scale. LTP = Lausanne Triadic Play.
† $p < .1$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

3.2. Handling missing data

To obtain unbiased estimates with missing data, we used a Full Information Maximum Likelihood estimation.

3.3. Dyadic behavioral dynamics variables and coparenting measures

In an initial effort to validate the Inconsolable Doll Task, we examined the association between the dyadic behavioral dynamics variables—negative escalation, synchrony, editing, and dominance—and other coparenting factors: prenatal and postnatal triadic family alliance (using the LTP) and perceptions of the coparenting relationship, as well as parental characteristics, namely, education. We predicted that higher ratings on dyadic synchrony and lower ratings on negative escalation, editing, and dominance would be linked with higher observed ratings of prenatal and postnatal family alliance and self-reports of the coparenting relationship. Furthermore, we expected that the dyadic behavioral dynamics ratings would be unrelated to parental education.

As Table 1 illustrates, these predictions were partially supported. Specifically, negative escalation, synchrony, and dominance were correlated, or marginally correlated, with prenatal maternal, but not paternal, self-reported coparenting quality in the predicted directions. Paternal and maternal postnatal self-reports of the coparenting relationships corresponded significantly with synchrony and marginally significantly with dominance. Coparenting synchrony was positively associated with both prenatal and postnatal measures of family alliance measured using the LTP. Lastly, as predicted, parental education was unrelated to any of the study's variables.

3.4. Prenatal dyadic behavioral dynamics variables predicting child development above and beyond prenatal coparenting measurements

To examine whether prenatal dyadic behavioral dynamics under stress were associated with the children's cognitive development at 18 months above and beyond other assessments of prenatal coparenting or parental education, we conducted a multiple regression analysis. As Table 2 shows, the results revealed that parents' higher ratings on negative escalation in pregnancy predicted children's lower scores on the early learning composite at 18 months. This finding was evident even when controlling for variance explained by prenatal low-stress behavioral coparenting dynamics, prenatal self-reported perceptions of coparenting, and parental education. To further understand the source of this effect, we ran a secondary set of multiple regression analyses, also presented in Table 2. Examination of the results revealed that this significant effect emerged from negative escalation predicting visual perception and marginally predicting children's' receptive language. Other prenatal dyadic behavioral dynamics under stress did not predict individual differences in children's cognitive development at 18 months.

3.5. Dyadic behavioral dynamics variables predicting child development above and beyond postnatal coparenting measurements

The final set of analyses evaluated whether prenatal dyadic behavioral dynamics under stress could predict children's cognitive development at 18 months above and beyond postnatal assessments of coparenting or parental education. Toward this end, we conducted a multiple regression analysis whose results are presented in Table 3. As predicted, parents' higher ratings on negative escalation in pregnancy predicted children's lower scores on the early learning composite at 18 months when controlling for postnatal low-stress behavioral coparenting dynamics, postnatal self-reported perceptions of coparenting, and parental education. A follow-up set of multiple regression analyses (see Table 3) revealed that this significant effect emerged from negative escalation predicting visual perception and receptive language at 18 months. Other prenatal dyadic behavioral dynamics under stress did not predict individual differences in children's cognitive development at 18 months.

Table 2
Regression Coefficients for Child Early Cognitive Development at 18-months Regressed on Prenatal Coparenting Measures and Parental Education.

	Visual Perception		Fine Motor Skills		Receptive Language		Expressive Language		Early Learning	
	β	*t*	*β*	*t*	*β*	*t*	*β*	*t*	*β*	*t*
IDCS Negative Escalation	−.33**	−2.99	−.15	−1.26	−.20†	−1.69	−.09	−.80	−.27*	−2.35
IDCS Dominance	−.05	−0.47	.12	.95	.05	.44	−.08	−.68	.01	.08
IDCS Edit	.14	1.16	.07	.52	.03	.24	.01	.10	.09	.74
IDCS Synchrony	.07	.53	.08	.59	−.00	−.01	−.19	−1.43	−.02	−.16
Prenatal Paternal CRS	.19†	1.77	.00	.04	.05	.47	−.01	−.07	.09	.84
Prenatal Maternal CRS	−.14	−1.26	.04	.35	.11	.94	.08	.70	.03	.26
Prenatal LTP	−.09	−.75	.06	.52	.15	1.22	.13	1.08	.10	.82
Paternal Education	.14	1.36	.01	.08	.05	.48	.17	.16	.07	.70
Maternal Education	−.25*	−2.48	−.09	−.79	−.08	−.71	−.19†	−1.76	−.20	−1.95

Note. IDCS = Interactive Dyadic Communication Scale. CRS = Coparental Relationship Scale. LTP = Lausanne Triadic Play.
† $p < .1$.
* $p < .05$.
** $p < .01$.

Table 3
Regression Coefficients for Child Early Cognitive Development at 18-months Regressed on Postnatal Coparenting Measures and Parental Education.

	Visual Perception		Fine Motor Skills		Receptive Language		Expressive Language		Early Learning	
	β	*t*	*β*	*t*	*β*	*t*	*β*	*t*	*β*	*t*
IDCS Negative Escalation	−.33**	−2.98	−.16	−1.41	−.24*	−2.04	−.12	−0.62	−.29**	−2.60
IDCS Dominance	−.06	−.51	.08	.71	.03	.25	−.10	−.82	−.02	−.14
IDCS Edit	.14	1.21	.05	.37	.02	.18	−.00	−.02	.07	.59
IDCS Synchrony	.05	.39	.07	.51	.06	.42	−.19	−1.43	−.01	−.05
Postnatal Paternal CRS	.08	.62	.01	.04	.06	.48	−.05	.34	.06	.44
Postnatal Maternal CRS	−.10	−.74	−.06	−.47	−.03	−.20	−.02	−.18	−.07	−.51
Postnatal LTP	−.08	−.72	.24*	2.10	.19†	1.74	.21†	1.83	.21*	1.92
Paternal Education	.10	1.01	.01	.06	.05	.46	.03	.24	.06	.60
Maternal Education	−.23*	−2.19	−.07	−.63	−.06	−.56	−.17	−.16	−.18†	−1.69

Note. IDCS = Interactive Dyadic Communication Scale. CRS = Coparental Relationship Scale. LTP = Lausanne Triadic Play.
† $p < .1$.
* $p < .05$.
** $p < .01$.

4. Discussion

Reviewing the field of child psychology reveals a much-welcomed trend of growing attention directed toward studying child development within the familial context in general, and the impact of the coparenting system on the child's developmental trajectory in particular. The novelty of our study is focusing on three measurements simultaneously to predict the child's cognitive development at 18 months: 1) examining the coparenting dynamics on the behavioral level as early as possible, i.e., in pregnancy; 2) activating and challenging the coparenting system to achieve high ecological validity, and; 3) including the presence of the child (or the represented child) in this assessment as an active participant contributing to the coparenting stress.

To do so, we developed the Inconsolable Doll Task (IDT), allowing us to ecologically test prenatal coparenting behavioral dynamics in a stressful context in the presence of a simulated baby. This longitudinal research was designed to establish the convergent validity of the IDT, as well as to determine its predictive validity. Findings revealed partial concurrent associations between prenatal coparenting dynamics under stress and behavioral family alliance dynamics under low-stress conditions and with self-reported coparenting representations. Although preliminary, and clearly in need of further replication, these results provide initial support that the IDT is an appropriate, validated, and ecological measure of coparenting dynamics and can be used to evaluate them in a stressful context, beginning even before the couple actually becomes parents.

Results also showed that prenatal coparenting behavioral dynamics under stressful conditions predicted important aspects of children's cognitive development at 18 months, even when controlling for other prenatal—and postnatal—coparenting assessments and parental education. In other words, the coparenting behavior revealed in the IDT explained a unique variance in children's cognitive development that was not accounted for by either self-reports of coparenting or by low-stress assessments of behavioral coparenting or self-reports of coparenting, even when measured postnatally. Indeed, the fact that these coparenting dynamics predicted the child's developmental trajectory when accounting for paternal and maternal education indicates that the coparenting dynamics explain a unique variance in the child's cognitive development beyond the parents' cognitive input (whether genetic or environmental). Thus, the IDT joins other self-reported and observed prenatal coparenting behavior measures, such as the PLTP and LTP, in adding to the unfolding complexity and richness of coparenting dynamics and their shaping of children's social, emotional, and cognitive outcomes.

The specific prenatal coparenting behavioral dynamic that emerged as predictive of subsequent child development was negative escalation, meaning the extent to which couples' negative affect and exchanges tend to escalate over the course of the interaction. It includes the chain effect by which the negative behavior of one partner is reciprocated in the same fashion by the other (Julien et al., 1989; Lindahl, Clements, & Markman, 1997).

Higher rates of negative prenatal coparenting dynamics were uniquely predictive of less advanced cognitive development in the child, above and beyond the variance explained by cognitions and representations of coparenting, or more positive coparenting behavioral dynamics—both prenatally and postnatally. This result suggests that when considering the influence of the multi-faceted concept of coparenting on child development, it is crucial to focus not only on the positive and functional ways through which the couple supports each other, but also on the negative elements of the coparenting unit. Notably, the self-reports of coparenting used in the study capture not only the positive elements in the coparenting system but also the negative ones, such as undermining. However, the findings of this work suggest that it is important not only to ask about, but also to observe, the actual behavioral dynamics of the couple to predict their impact on the child's development more fully.

An interesting aspect of our results is that they are somewhat counterintuitive. It would have been reasonable to hypothesize that any postnatal behavioral assessment of parenting, meaning, a "real one," would be more predictive of the child's development than any hypothesized, "pretend" prenatal measurement. Nonetheless, this study's results show otherwise: the behavioral prenatal coparenting dynamics revealed in the IDT contain a unique component related to negativity and destruction in coparenting relationships that longitudinally predicts the child's development even when controlling for variance explained by postnatal coparenting

behavioral patterns.

It appears that perhaps more than the importance of having positive interactions, in the form of synchrony captured in the IDT, or playfulness, assessed in the LTP, it is critical to identify the negative, malignant components of the coparenting relationship. They appear to have a lingering and persistent impact on the child's ability to learn about the world and develop cognitively, despite all of the positive, nurturing, or synchronous coparenting patterns to which he or she is exposed.

These results corroborate previous theories and findings indicating that negative marital and coparenting dynamics have an unfavorable effect on the child's development (Belsky et al., 1995; Gable, Crnic, & Belsky, 1994; Jouriles et al., 1991; Schoppe et al., 2001), increasing the probability of children's disorders associated with marital discord, including effects on cognitive, social, academic, and even psychobiological functioning (e.g., Cummings & Davies, 1994; Cummings & Davies, 2002; El-Sheikh, Harger, & Whitson, 2001; Fergusson & Horwood, 1998). Indeed, in their review, Johnston and Mash (2001) presented evidence suggesting that the presence of ADHD in children is associated, among other variables, with varying degrees of disturbances in family and marital functioning. Other studies also demonstrate specific links between marital conflict and cognitive competence, and grade point average (Grych & Fincham, 1990).

It is noteworthy that in contrast to our prediction, of the four IDT variables reported here, only synchrony was consistently associated with both self-reported and behavioral prenatal coparenting assessments. This finding may not be entirely surprising given that self-reports and observations are often unrelated (Altenburger et al., 2014; Kuersten-Hogan, 2017; Lorenz, Melby, Conger, & Xu, 2007). Our finding corresponds with McHale et al.'s (McHale, Kazali et al., 2004; McHale, Kuersten-Hogan et al., 2004) study, in which only a small number of significant correlations between self-reported and observational coparenting were revealed when accounting for marital quality. Nonetheless, in light of the persistence of several cross-method, domain-specific ties, the researchers called for further research on how parents' perceptions of their coparenting activities can contribute to our understanding of family processes.

It is possible that the positive aspects measured in the IDT, namely, synchrony, are more closely related to the facets of coparenting captured both in the CRS or the PLTP, which focus more, albeit not exclusively, on the strengths and positive aspects of the coparenting relationship. This pattern of findings adds to the robustness of the IDT, especially in light of the fact that unlike the IDCS synchrony scale, no significant correlations were found between any of the self-reported (CRS) and other observational behaviors (LTP) measured. It could be argued that these findings tentatively support the usefulness of the IDT in capturing both cognitive representations of the degree of synchrony, cohesion, and support in the coparenting relationship, as well as their behavioral manifestations. Nonetheless, more research to explore this possible avenue further is clearly needed.

To the best of our knowledge, contemporary research investigating links between coparenting quality and young children's adjustment has chiefly focused on how coparenting quality impacts the child's socio-emotional wellbeing and adjustment. For example, studies have produced outcomes related to attachment, behavior problems, anxiety, depression, and peer relations (Belsky, Putnam et al., 1996; Belsky, Woodworth et al., 1996; Brown et al., 2010; Feinberg et al., 2007; Jacobvitz et al., 2004; Katz & Low, 2004; LeRoy, Mahoney, Pargament, & DeMaris, 2013; Lindsey & Caldera, 2005; McHale & Rasmussen, 1998; Schoppe et al., 2001; Teubert & Pinquart, 2010). In contrast, studies examining the influence of coparenting dynamics on the child's cognitive development and ability are rare. Exceptions are the work of Cabrera et al. (2012) and Dopkins Stright and Neitzel (2003), who documented that supportive, versus undermining and conflictual, coparenting dynamics predicted children's math levels, literacy, and higher grades in the classroom.

Nonetheless, in these studies, the ages of the children were four to eight years old (perceptively). The current study adds an important contribution by showing that already in infancy, at the age of 18 months, infants immersed in a family system characterized by a high level of negative escalations demonstrate less advanced cognitive development than babies living in a home with fewer manifestations of this coparenting dynamic. These significant findings suggest that when infants are exposed to conflictual, negative, and aggressive interpersonal surroundings, their ability to freely and calmly explore their environment and surroundings is dampened, possibly leading to a cognitive development that does not optimize their full potential.

4.1. Study's limitations and directions for future research

The current study joins empirical and clinical interest in the importance of prenatal coparenting dynamics for subsequent child development. By using a novel methodological approach, we were able to demonstrate that negative coparenting behavioral patterns under stressful conditions and in the presence of a simulated infant predicted the child's cognitive development more than 18 months later, even when controlling for both prenatal and postnatal perceptions of the coparenting relationship and coparenting behavioral patterns under low-stress conditions. These results contribute to the accumulating evidence regarding the importance of coparenting to child development, and underscore its complexity and multifaceted quality.

However, these findings need to be viewed in light of several caveats. First, this was the first study to use the IDCS to assess coparenting within a dynamic task, and only some of its variables proved to be associated with other coparenting measures. Further studies need to be conducted to corroborate the findings of the current investigation and to establish the usefulness of the IDCS in the coparenting context.

Second, the study used a low-risk, community-based sample, which limits the generalizability of the findings to other populations. It is possible that higher-risk families would exhibit different coparenting dynamics under stressful conditions, which would illuminate the interpersonal environment within which the child grows. Thus, replication studies would benefit from including a high-risk sample and comparing it to the current findings pertaining to the low-risk sample.

Given that the prenatal measurement of coparenting behavioral dynamics under stress proved useful in predicting certain aspects

of child development and adding to the multifaceted complexity of coparenting, future studies would benefit from including a postnatal assessment of this aspect of coparenting, thereby corroborating its convergent validity further. A promising path would be using the "onesie" procedure, used by Brown et al. (2010) and Schoppe-Sullivan et al. (2007), which has proved useful in explaining individual differences in coparenting patterns. Alternatively, the IDT could also be used postnatally to activate parents' relatively established coparenting dynamics (rather than in formation during pregnancy) under systematic, standardized conditions that could not be undertaken with actual infants. Doing so would allow us to control for infants' individual temperamental differences that inevitably influence coparenting dynamics. Finally, and in line with Belsky (1984), follow-up studies that include parenting variables, such as parental stress or competence, as well as child variables, such as temperament, would advance our understanding of the complex family processes shaping children's optimal functioning.

From a methodological perspective, recall that the current design of the study was limited in terms of a lack of counterbalance between the IDT and the PLTP in that the PLTP always preceded the IDT. The PLTP appeared to be helpful in getting couples comfortable with the pretend and role-play stance that was needed when interacting with the doll simulator in the IDT. Furthermore, it seemed useful to build the lab visit so that the first task was positive, and only then introduce the couples to a more challenging task. However, it is not impossible that the pattern of coparenting parenting behaviors we witnessed in the IDT task were somewhat influenced by the preceding PLTP interaction. Therefore, we suggest that future studies counterbalance the tasks to ensure the most accurate and precise data collection.

Thankfully, more often than not, parents' actions and behaviors when trying to console their baby prove successful. Keeping this in mind, and while expanding the ecological validity of the IDT, future studies could benefit from evaluating coparenting relationships in stressful situations so that the simulated doll is also programmed to be responsive to parental care. Such a design would clearly need to be longer to allow parents to respond to the simulated infant but could nonetheless further illuminate the complex yet intriguing construct of coparenting.

4.2. Clinical implications

Despite using a new methodology that would surely benefit from further replication, the results of the current investigations could inform clinical practice in several ways. First, the findings indicate that not only positive coparenting and family alliance patterns (as shown in the LTP and the coparenting self-reports) impact the child's development, but that negative coparenting behavioral dynamics are also a unique variable in the child's cognitive ability at 18 months. Moreover, the prenatal synchronous coparenting behavioral dynamic assessed in the IDT did not predict children's cognitive advancement at 18 months. In this sense, we might be able to speak about the importance of coparenting quality not only in terms of a protective factor, but also as a risk factor. Put differently, the findings suggest that in order for a child to develop optimally, he or she needs not only a positive coparenting environment, but also one in which negative qualities are absent. This insight leads us to discuss the applicable potential of the current work in terms of identifying risk factors even parentally.

Specifically, the use of the RealCare Baby® II-Plus infant simulator in the Inconsolable Doll Task was an invaluable technological advancement allowing the creation of an ethical, yet ecological, prenatal measurement of a high-stress situation that illuminates the process and dynamics parents will inevitably face with their young infants. It permitted the simulation of a normative and frequent situation whereby the infant cries inconsolably and both parents need to work together to determine the reason for the baby's distress and how to help soothe the infant. The realness and authenticity of the doll simulator evoked powerful and genuine responses from the future parents, which proved to be predictive of the child's developmental achievements more than a year and a half later.

Thus, the IDT could be used clinically to identify potentially maladaptive and less-than-optimal coparenting communicative and behavioral patterns among romantically involved couples, not only before the baby is born, but perhaps even pre-conception. Put differently, such an early assessment could be used not only for intervention, but also for the prevention of maladaptive coparenting patterns that could later on lead to non-optimal child developmental trajectories. Such work could be incorporated into clinical interventions such as the Family Foundations (FF; Feinberg & Kan, 2008; Feinberg, Xia, Fosco, Heyman, & Chow, 2017). The FF is a universal prevention program aimed at helping couples navigate the transition to parenthood by developing their mutual support, conflict management, and problem-solving skills. In a series of studies, the FF has proved to be useful in terms of couples developing more cohesive relationships, reducing stress and depression, boosting parenting quality, and leading to better child self-regulation and adjustment (Feinberg, Kan, & Goslin, 2009; 2010, 2015; Feinberg et al., 2016). Early intervention, as early as prenatally, not only helps parents build or improve their coparenting skills and translate them into practices for daily life (Ferraro, Malespin, Oehme, Bruker, & Opel, 2016), but also enhances and benefits children's cognitive and emotional development.

Funding

This research was supported by grants from the Israeli Science Foundation (No. 1888/14), and the FP7-PEOPLE-2012-IEF - Marie-Curie Action: Intra-European Fellowships for Career Development (IEF) under grant #300805.

Acknowledgments

I am grateful to Rotem Bergner and Dr. Ohad Szepsenwol, whose superb assistance in reviewing the literature cited, statistical consultation, and reviews of earlier versions of the article helped bring this effort to fruition. I would also like to thank Gal Leibovitz for managing the lab and the data collection so thoroughly. Finally, I wish to thank all of the families who participated in this study

and trusted us to walk alongside them on their path into parenthood.

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