

Antecedents of fathers' perception of child behavior at child age 12 months

Thomas Skjothaug^{1,2,3} | Lars Smith² | Tore Wentzel-Larsen^{3,4} | Erik Stänicke² | Vibeke Moe^{2,3}

¹ BUP Vest, Diakonhjemmet Hospital, Oslo, Norway

² University of Oslo, Oslo, Norway

³ Centre for Child and Adolescent Mental Health, Eastern and Southern Norway, Oslo, Norway

⁴ Norwegian Centre for Violence and Traumatic Stress Studies, Oslo, Norway

Correspondence

Thomas Skjothaug, BUP Vest, Diakonhjemmet Hospital, 0373 Oslo, Norway.
Email: tskjotha@gmail.no;
thomas.skjothaug@diakonsyk.no

ABSTRACT

This study investigates whether fathers' adverse childhood experiences (ACE) and attachment style reported during pregnancy predict fathers' perception of child behavior assessed 12 months postpartum, expressed by the Parenting Stress Index (PSI), Child Domain. Prospective fathers ($N = 835$) were recruited to "The Little in Norway (LiN) study" (Moe & Smith) at nine well-baby clinics in Norway, with data collection composed of five time points during pregnancy and two time points postpartum (6 and 12 months). The main analyses included linear regression, path-analysis modeling, and intraclass correlation based on mixed effects modeling. First, linear regression analyses showed that neither fathers' ACE nor attachment style significantly predicted perceived child behavior postpartum directly. Furthermore, path analyses showed that ACE and less secure attachment style (especially avoidant attachment) measured early in pregnancy strongly predicted negatively perceived child behavior, mediated by fathers' mental health symptoms during pregnancy and partner disharmony postpartum. Second, intraclass correlation analyses showed that fathers' perceived child behavior showed substantial stability between 6 and 12 months postpartum. Family interventions beginning in pregnancy may be most beneficial given that fathers' early experiences and perceptions of attachment in pregnancy were associated with later partner disharmony and stress.

KEYWORDS

fathers' adverse childhood experiences, fathers' attachment style, fathers' mental health, fathers' parenting stress, partner disharmony, perceived child behavior

RESUMEN

Este estudio investiga si las experiencias adversas de los papás en su niñez y el estilo de afectividad reportado durante el embarazo predicen las percepciones de los papás sobre el comportamiento del niño según evaluación a los 12 meses después del parto, expresada por el Índice de Estrés de Crianza (PSI), Ámbito del Niño. Los papás con la posibilidad de participar ($N = 835$) fueron reclutados para el "estudio El Pequeño en Noruega (LiN)" (Moe y Smith, 2010) en nueve

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2020 The Authors. *Infant Mental Health Journal* published by Wiley Periodicals, Inc. on behalf of Michigan Association for Infant Mental Health.

clínicas de revisión pediátrica en Noruega, con un proceso de recoger información compuesto de cinco momentos temporales durante el embarazo y dos momentos después del parto (6 y 12 meses). Los análisis principales incluyeron regresión lineal, diseños de análisis de trayectoria y correlación intraclase basados en diseños de efectos mixtos. Primero, los análisis de regresión lineal mostraron que ni las experiencias adversas de los papás en su niñez ni el estilo de afectividad predijeron significativamente la percepción del comportamiento del niño posterior al parto directamente. Es más, los análisis de trayectoria mostraron que las experiencias adversas en la niñez y un menos seguro estilo de afectividad (especialmente la afectividad esquivada) tal como fueron medidos a principios del embarazo predijeron fuertemente la percepción negativa del comportamiento del niño, todo lo cual fue mediado por los síntomas de salud mental de los papás durante el embarazo y la desarmonía de la pareja después del parto. Segundo, los análisis de correlación intraclase mostraron que la percepción que tenían los papás acerca del comportamiento del niño mostraba una estabilidad sustancial entre los 6 y 12 meses después del parto. Las intervenciones familiares que comienzan durante el embarazo pudieran ser más beneficiosas dado que las tempranas experiencias de los papás y sus percepciones de la afectividad durante el embarazo se asociaron con la posterior desarmonía y estrés de la pareja.

PALABRAS CLAVES

Experiencias adversas en la niñez, salud mental de los papás, estilo de afectividad de la pareja, percepción del comportamiento del niño, desarmonía de la pareja

RÉSUMÉ

Cette étude s'est interrogée si les expériences adverses de l'enfance des pères et le style d'attachement rapporté durant la grossesse prédisait la perception des pères du comportement de l'enfant évalué 12 mois après la naissance, exprimé par l'Index de Stress de Parentage (en anglais PSI), le Domaine de l'Enfant. Des pères potentiels (N = 835) ont été recrutés pour l'étude norvégienne "The Little in Norway (LiN) study" (Moe & Smith, 2010) dans neuf cliniques de bien-être du bébé en Norvège, avec un recueil de données comprenant cinq points de recueil durant la grossesse et deux après la grossesse (6 et 12 mois). Les analyses principales ont inclus une régression linéaire, une modélisation de l'analyse des trajectoires et une corrélation intraclasse basée sur une modélisation des effets mixtes. Tout d'abord, les analyses de régression linéaires ont montré que ni les expériences adverses vécues par les pères durant leur enfance ni le style d'attachement ne prédisait directement de façon importante le comportement de l'enfant perçu après la naissance. De plus les analyses de parcours ont montré que les expériences adverses vécues pendant l'enfance et le style d'attachement moins sécurisé (particulièrement l'attachement évitant) mesurés tôt dans la grossesse prédisaient fortement le comportement de l'enfant perçu négativement, médié par les symptômes de santé mentale des pères durant la grossesse et la discorde entre partenaires après la naissance. Deuxièmement les analyses de corrélation intraclasse ont montré que le comportement de l'enfant perçu des pères faisait preuve de stabilité substantielle entre 6 et 12 mois après la naissance. Des interventions sur la famille commençant durant la grossesse peuvent être plus bénéfiques au vu des expériences vécues des pères et les perceptions de l'attachement durant la grossesse étaient liées à la discorde ultérieure entre les partenaires et au stress.

MOTS CLÉS

expériences adverses de l'enfance, santé mentale des pères, style d'attachement du partenaire, comportement de l'enfant perçu, discorde entre partenaires

ZUSAMMENFASSUNG

In dieser Studie wurde untersucht, ob während der Schwangerschaft erhobene, aversive Kindheitserfahrungen und Bindungsstile des Vaters die väterliche Wahrnehmung des kindlichen Verhaltens vorhersagen können, die 12 Monate nach der Geburt durch den Parenting Stress Index (PSI) (Child Domain) gemessen wurden. N = 835 werdende Väter

wurden in neun Well-Baby-Kliniken in Norwegen für die Studie „The Little in Norway (LiN)“ (Moe & Smith, 2010) angeworben. Die Datenerhebung umfasste fünf Zeitpunkte während der Schwangerschaft und zwei Zeitpunkte nach der Geburt (6 und 12 Monate). Die Hauptanalysen bestanden aus linearer Regression, Pfadanalysemodellierung und Intraclass-Korrelationen, basierend auf Mixed-Effects-Modellierung. Die linearen Regressionsanalysen zeigten, dass weder die aversiven Kindheitserfahrungen der Väter noch der Bindungsstil die Wahrnehmung des kindlichen Verhaltens unmittelbar nach der Geburt signifikant vorhersagten. Darüber hinaus zeigten Pfadanalysen, dass die zu Schwangerschaftsbeginn erhobenen, aversiven Kindheitserfahrungen und weniger sicheren Bindungsstile des Vaters (insbesondere vermeidende Bindung) negativ wahrgenommenes kindliches Verhalten vorhersagen konnten, mediert durch psychische Symptome des Vaters während der Schwangerschaft und die Disharmonie in der Partnerschaft nach der Geburt. Die Intraclass-Korrelationsanalysen zeigten, dass die väterliche Wahrnehmung des kindlichen Verhaltens zwischen 6 und 12 Monaten nach der Geburt eine erhebliche Stabilität aufwies. Bereits in der Schwangerschaft beginnende Familieninterventionen könnten einen positiven Effekt haben, da frühe Erfahrungen und die Bindungswahrnehmung des Vaters in der Schwangerschaft mit späterer Disharmonie und Stress in Verbindung gebracht werden konnten.

STICHWÖRTER

Aversive Kindheitserfahrungen, geistige Gesundheit des Vaters, Bindungsstil in der Partnerschaft, Wahrnehmung des kindlichen Verhaltens, Disharmonie in der Partnerschaft

抄録

本研究では、妊娠中に報告された父親の逆境的な子ども時代の体験とアタッチメントのスタイルが、産後12か月時に実施された育児ストレスインデックス(PSI)の子どもの側面に表れた子どもの行動に関する父親の認識を予測できるかどうかについて調査した。父親になろうとしている人たち(N = 835)が、ノルウェーの9か所の育児相談において妊娠中5回と出産後2回(6ヶ月と12ヶ月)にデータを収集した「リトル・イン・ノルウェー(LiN)研究」(Moe & Smith, 2010)の対象とされた。おもな分析は、線形回帰分析、経路分析モデルと混合効果モデルを基にした級内相関を行った。第一に、線形回帰分析では、父親の逆境的な子ども時代の体験も、アタッチメントのスタイルも直接には出産後の子どもの行動に関する認識を優位に予測するものではないことが示された。さらに、経路分析では、逆境的な子ども時代の体験と妊娠初期測定された不安定なアタッチメントのスタイル(特に回避型アタッチメント)は、妊娠中の父親のメンタルヘルスの症状と出産後のパートナーとの不調和に介在され、子どもの行動を否定的に認識することを非常に強く予測することが示された。第二に、級内相関分析では、子どもの行動に関する父親の認識は、産後6ヶ月と12か月の間では、実質的な安定を示していた。妊娠中に始まる家族への介入は、父親の乳幼児期の体験と妊娠中のアタッチメントの認識が後のパートナーとの不調和とストレスに関係しているということにかなり有益であると思われる。

キーワード

逆境的な子ども時代の体験, 父親のメンタルヘルス, パートナーのアタッチメントスタイル, 子どもの行動の認識, パートナーとの不調和

摘要

本研究旨在探讨怀孕期上报的父亲童年不良经历和依恋方式是否能预测产后12个月父亲对儿童行为的感知力, 并以“父母压力指数量表(PSI)”中的儿童分量表来表达。挪威的九家健康婴儿诊所招募了835名准父亲去参加“挪威儿童(LiN)研究”(Moe&Smith, 2010), 并收集了怀孕期间的五个时间点和产后(6个月和12个月)两个时间点的数据。本文主要采用了线性回归、路径分析模型以及基于混合效应模型的组内相关来分析这些数据。首先, 线性回归分析显示, 父亲的童年不良经历和依恋方式对产后的儿童行为感知力均无直接预测作用。此外, 路径分析显示, 怀孕初期父亲的童年不良经历和较不安全的依恋方式(尤其是回避型依恋)显著预测了其迟钝的儿童行为感知力,

这是由怀孕期父亲的心理健康状态和产后伴侣不和谐引起的。其次，组内相关分析显示，在产后6到12个月，父亲的儿童行为感知力表现出显著的稳定性。鉴于怀孕期间父亲的早期经历和对依恋的感知力都与产后伴侣的不和谐及压力有关，因此从怀孕开始就进行家庭干预可能是最为有益的。

關鍵詞

童年期不良经历，父亲心理健康，伴侣依恋方式，儿童行为感知力，伴侣不和谐

سوابق تصور الآباء للسلوك الطفولي في عمر 12 شهرا

ملخص

تبحث هذه الدراسة ما إذا كانت تجارب الطفولة السلبية للآباء وأسلوب التعلق المبلغ عنه أثناء الحمل تتنبأ بتصور الآباء لسلوك الطفل عند تقييمه بعد 12 شهر من الولادة، وفقاً لمؤشر الإجهاد الأبوي (PSI)، مجال الطفل. تم تعيين الآباء المحتملين (N = 835) للمشاركة في الدراسة التي كان عنوانها "الصغير في النرويج LiN" التي أجراها (مو و سميث 2010) في تسع عيادات أطفال في النرويج، مع جمع البيانات من خمس نقاط زمنية أثناء الحمل ونقطتين زمنيتين بعد الولادة (6 و 12 شهراً). وشملت التحليلات الرئيسية الانحدار الخطي، ونمذجة تحليل المسارات، والارتباط داخل الفئات على أساس نمذجة الآثار المختلطة. أولاً، أظهرت تحليلات الانحدار الخطي أن تجارب الطفولة السلبية للآباء أو أسلوب التعلق لم يتنبأ بشكل كبير بسلوك الطفل المتصور بعد الولادة مباشرة. وعلاوة على ذلك، أظهرت تحليلات المسار أن تجارب الطفولة السلبية وأسلوب التعلق الأقل أماناً (وخاصة التعلق المتجنب الذي تم قياسه في وقت مبكر من الحمل تنبأ بشدة بالتصور السلبي لسلوك الطفل، وتدخلت في ذلك متغيرات وسيطة أخرى مثل أعراض صحة الآباء النفسية أثناء الحمل وعدم التوافق بين الزوجين بعد الولادة. ثانياً، أظهرت تحليلات الارتباط أن تصور الآباء لسلوك الطفل أظهر استقراراً كبيراً بين 6 إلى 12 شهراً بعد الولادة. قد تكون التدخلات الأسرية التي تبدأ في الحمل مفيدة للغاية نظراً لأن تجارب الآباء المبكرة وتصوراتهم للتعلق أثناء الحمل ارتبطت في وقت لاحق بتنافر الزوجين والإجهاد العصبي.

الكلمات الرئيسية: تجارب الطفولة السلبية، الصحة النفسية للآباء، نمط تعلق الشريك، سلوك الطفل المتصور، تنافر الشريك

1 | INTRODUCTION

Fathers' caregiving is considered to be important for children's development in infancy and early childhood (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000), with their parenting influenced by multiple intrafamilial and extrafamilial factors (Van Holland De Graaf, Hoogenboom, De Roos, & Bucx, 2014). One of these influences is stress, and it is well known that parenthood can be experienced as stressful (Skjothaug, Smith, Wentzel-Larsen, & Moe, 2018).

Previous research has shown that salient predictors of parental stress include negative life events, mental health problems, such as anxiety and depression, marital discord (Webster-Stratton, 1990), and parental developmental history (Belsky, 1984). Moreover, it has been found that stress influences parenting behavior and may be a determinant of dysfunctional parenting (Abidin, 1990, 1992, 1995; Belsky, 1984; Östberg & Hagekull, 2000). Parenting stress was defined by Abidin as the discrepancy between the required resources of the parental role and the perceived resources available to meet those requests (Abidin, 1995).

Family interventions ought to be started early, because a father's negative perception of the child's behavior can be predicted early on in becoming a father (Webster-Stratton, 1989). Taken together, the findings from the present paper point to the importance of addressing fathers' mental health in the early fatherhood period in order to provide support when needed, even before the child is born. Especially, adverse childhood experiences (ACE), partner attachment style, mental health, and partner harmony seemingly act in concert to shape paternal perceptions of their infants, which again may affect child development, and also the whole family, over time.

To the best of the authors' knowledge, there is still a dearth of information concerning why fathers experience stress in the parenting role, and whether the way they perceive their children can be traced back to their own characteristics and life experiences before fatherhood. There is little information as to whether such perceptions can be predicted as early as during pregnancy. Skjothaug et al. (2018) found that prospective fathers' mental health, as well as their own ACE, significantly predicted parenting

stress, expressed as negatively perceived child behavior at 6 months postpartum. How fathers view their children's behavior negatively in pregnancy and throughout the first year of life may also influence caregiving behavior negatively, which in turn may harm the children's development. Studies have shown that multiple risks exceed the effect of the adverse developmental impacts of singular exposures (Trentacosta et al., 2008). We therefore assumed that by assessing multiple risk factors, such as fathers' previous experiences and partner disharmony, it would be possible to investigate the determinants of fathers' perceived child behavior at 12 months.

Shannon and colleagues have shown how men's childhood experiences with their parents influence their involvement with their own child in infancy (Shannon, Tamis-LeMonda, & Cabrera, 2006), whereas parents with a history of high cumulative ACE have greater challenges in modulating their own stress responses (Szilagyi et al., 2016). It has been argued that reported infant behavioral characteristics may be partially related to parental inner representations and perceptions, rather than being merely a true objective judgement of the child's character (Pauli-Pott, Mertesacker, Bade, Haverkock, & Beckmann, 2003).

Bowlby (1969) proposed that early experiences of care from attachment figures shape feelings, beliefs, and expectations of relationships across the lifespan, which he described as "internal working models" (IWMs). He suggested that these IWMs will prevail and may influence later attachment relationships, such as the attachment relationships to romantic partners, as well as relationships between the parents and their own child (Fox, Platz, & Bentley, 1995; Hazan & Shaver, 1987; Nelson-Coffey, Borelli, & River, 2017). Adult attachment style, as assessed by self-report instruments such as the Experiences in Close Relationships Scale (ECR; Brennan, Clark, & Shaver, 1998; Shaver & Mikulincer, 2004), focuses on more recent experiences in close relationships, rather than on earlier childhood relationships with primary caregivers (Jones, Cassidy, & Shaver, 2015). In line with Bowlby's original theory of IWMs, adult attachment style is a concept that is thought to reflect global internal representations of the self and others in close relationships, instead of a relationship with a specific partner (Shaver & Mikulincer, 2004; Stern et al., 2018).

We already know that fathers' attachment style prevails over time, based upon their experiences with their parents, and that in two-parent families children simultaneously form attachment relationships with "both" their mothers and their fathers (Easterbrooks & Goldberg, 1987). Research on mothers suggests a relatively enduring prototype underlying their attachment style. Stern et al. (2018) found that mothers' attachment styles are generally stable during the first 2 years of motherhood following the

birth of their first child (Stern et al., 2018). Moe, von Soest, Fredriksen, Olafsen, and Smith (2018) also showed that mothers' attachment style assessed in pregnancy predicted parenting stress 1 year after birth. Even though these two studies related to mothers, other research reveals that both parents' adult attachment orientations are associated with the ways they exhibit parenting (Jones et al., 2015). However, research on fathers' attachment styles during pregnancy is still limited, providing a good reason to investigate such issues among prospective fathers.

Bowlby (1969) noted that parents yearn to be bonded to their baby during pregnancy, and that this desire includes being psychologically close to their unborn child. He also proposed the concept of a parenting alliance, which refers to the unique and specific component of the marital relationship that concerns parenting (Weissman & Cohen, 1985), and normally begins before birth (Luz, George, Vieux, & Spitz, 2017). Several studies suggest that a caregiver's own attachment experiences are associated with the caregiver's attachment bonding (Van IJzendoorn, 1995; Ward & Carlson, 1995). It is therefore commonly assumed that the bonding relationship begins during pregnancy and continues into the postpartum period (Goulet, Bell, St-Cyr Tribble, Paul, & Lang, 1998). It has been found that among first-time parents the quality of partners' postnatal relationship mediates the association between prenatal insecure attachment style and postnatal co-parenting quality 6 months postpartum (Bouchard, 2014); the parenting alliance has also been found to be associated with child adjustment (Belsky, Woodworth, & Crnic, 1996), parental involvement (McBride & Rane, 1998), and child outcomes (Feinberg, Kan, & Hetherington, 2007).

Even though most research has focused upon mothers' mental health, more recent research has drawn attention to both prospective parents' mental health during pregnancy, and not only postpartum. Figueiredo and Conde (2011) found that 15.9% of parents-to-be were highly anxious and/or depressed during pregnancy—compared with 9.3% at 3 months postpartum. More recent research has found that roughly 10% of new dads experience mental health difficulties, including depression and anxiety on their pathway to becoming fathers. This is an overlooked public health problem (Roubinow, Luecken, Crnic, & Gonzales, 2014; Singley & Edwards, 2015), making the research effort on men's mental health and parenthood even more warranted. More specifically, there is a limited amount of research on the association between fathers' mental health and their perceptions of infant behavioral characteristics after birth (Parfitt, Ayers, Pike, Jessop, & Ford, 2014). It has been found that parents with mental health problems in pregnancy experience stress elevation 12 months postpartum (Perren, Von Wyl, Bürgin, Simoni, & Von Klitzing, 2005), and comparable symptom scores

have been found among depressed mothers and depressed fathers (Field et al., 2006; Figueiredo & Conde, 2011). It has also been shown that as many as 20% of fathers-to-be show high levels of anxiety during pregnancy, with a peak during the first and third trimester and higher levels in pregnancy, as compared to postpartum (Figueiredo & Conde, 2011). Similarly, Kim and Swain (2007) also found that more than 10% of fathers-to-be experienced some type of prenatal mood or anxiety disorder. Prevalence rates for “any” anxiety disorders are fairly stable between the prenatal period (between 4.1% and 16%) and postpartum (between 2.4% and 18%) (Leach, Poyser, Cooklin, & Giallo, 2016), thus highlighting the need for screening fathers-to-be for depression and anxiety in pregnancy.

Importantly, mental health seems to prevail over time; Wee, Skouteris, Richardson, MacPhie, and Hill (2015) found that fathers’ high levels of anxiety early in pregnancy predicted high levels of depression and stress in late pregnancy. Hence, worries, preoccupations, generalized anxiety, and/or specific phobias can persist during pregnancy and into the postnatal period (Fenaroli & Saita, 2013). Ramchandani et al. (2008) reported that high prenatal symptom scores for depression and anxiety were the strongest predictors of paternal postnatal depression. Mental health may also serve as an important mediator of parenting stress. In particular, it has been shown that depression and anxiety mediate between parenting stress and parental dyadic adjustment at infant age 12 months, and there are no significant differences between the mediated pathways of mothers and fathers (Rollè et al., 2017).

Men experience changes during their pathway to parenthood, and these changes are important in developing the relationship with their child (Musser, Ahmed, Foli, & Codrington, 2013). Therefore, fathers-to-be who experience a lack of information about pregnancy and childbirth, and who have little social support, also experience higher levels of anxiety (Condon, Boyce, & Corkindale, 2004). Furthermore, men experiencing a discrepancy between a more traditional male gender role and contemporary expectations of fathering behavior during pregnancy often experience distress (Singley & Edwards, 2015). Such distress may result in disconnection and withdrawal from the family, and in some cases lead to mental health concerns, such as anxiety and depression. A consequence of being depressed may be that the father experiences his child’s behavioral characteristics negatively and interacts with his child in a withdrawn way, thereby displaying less verbal and behavioral stimulation compared to nondepressed fathers. Hence, distressed fathers may initiate a compromised pattern of parenting, which may potentially negatively affect their children’s development (Sethna, Murray, Netsi, Psychogiou, & Ramchandani, 2015).

Few studies have examined fathers’ parenting stress and how they perceive their children’s behavioral characteristics over time (Chang et al., 2004). One purpose of the present study was to investigate the stability of fathers’ perceptions of their child’s behavior between 6- and 12-month child age. Previous research has shown that mothers’ perceptions of infant characteristics are moderately stable from pregnancy through the first few months of life (Mebert & Kalinowski, 1986; Zeanah, Keener, Stewart, & Anders, 1985). Although most of these studies have been conducted with mothers-to-be, they may have transfer value for fathers in the same life situation. Zeanah, Keener, and Anders (1986) found an association between both parents expected prenatal ratings of their child’s behavioral characteristics and temperament and infant characteristics at 6 months postpartum, even though fewer associations were found for fathers compared with mothers. This suggests that both parents’ representations of their infants are present even before the child is born, and that these prenatal representations are associated with parental interpretations of child characteristics and behavior after birth (Benoit, Zeanah, Parker, Nicholson, & Coolbear, 1997).

2 | STUDY AIMS AND EXPECTATIONS

The present study aims to help understand the multifaceted antecedents of parenting stress (Skjothaug et al., 2018) and may inform early intervention efforts aimed at supporting fathers and their partners in the potentially difficult transition period around childbirth. This paper focuses upon three overarching research aims among men in the transition to fatherhood: First, to investigate whether retrospectively reported ACE and attachment style, assessed before the child is born, predict the later perception of child behavioral characteristics at child age 12 months postpartum.

Second, to investigate whether the relationships are mediated by anxious and depressive symptoms during pregnancy, and depressive symptoms and partner disharmony at 12 months postpartum. Third, to investigate the stability of fathers’ perception of the child’s behavioral characteristics during the child’s first year, between 6 and 12 months.

Based on previous research, we expected that elevated ACE and insecure attachment style in pregnancy would predict more negative perceptions of child behavior at 12 months postpartum. We further expected that ACE and insecure attachment style would be mediated by anxious and depressive symptoms in pregnancy, and by depressive symptoms and partner disharmony postpartum. Last, in line with previous studies of mothers, we

expected to find stability in fathers' reports of perceived child behavioral characteristics between 6 and 12 months postpartum.

3 | METHODS

3.1 | Recruitment and participants

Participating fathers and mothers-to-be were recruited from The Little in Norway study (Moe & Smith, 2010) from nine different well-baby clinics in Norway. This study is a community-based population study with a prospective cohort design, investigating pre- and postnatal risk, in addition to promoting factors influencing early childhood development and mental health (Skjothaug, Smith, Wentzel-Larsen, & Moe, 2014). Enrollment started in September 2011 and lasted to October 2012, with data collection up to child age 18 months completed in November 2014. Midwives at the well-baby clinics approached pregnant women at 16–26 weeks of gestation with an invitation to participate. Their partners were then invited to participate in the study as independent informants by means of self-report questionnaires. In the LiN study, a total of 1,041 families consented to participate and after startup, five families withdrew their consent, leaving us with participating 1,036 families.

Figure 3 shows recruitment and response rates ($N = 1,036$). The time frame for enrollment is wide due to variation as to when the mothers-to-be received contact at the baby-well clinic and thereby were asked to participate in the present study. Some participants missed the early data collection points, resulting in reduced participants at T^1 and T^2 . Some families dropped out during the course of pregnancy ($n = 34$). Further, there were considerable intermittent missingness, meaning that families could miss one or more data collection points, or have partial data at a data collection point, but still continue to contribute with data at later data collection waves. The participating person of reference was the mother. Hence, the analysis for the present study thus included 835 fathers, as some fathers missed out on the outcome variables.

A public healthcare nurse was trained as a research assistant at each of the nine sites; these sites were chosen after considering demographic characteristics. The study population included participants from cities and rural districts with a wide distribution of socioeconomic conditions. The present study is a sub-study of an ongoing project registered in the Committee of Medical Journal Editors (ISRCTN) registry (Moe & Smith, 2010). This is a primary clinical trial registry recognized by the World Health Organization (WHO) and Committee of Medi-

TABLE 1 Demographics

Item	N	Mean	Standard deviation	Range
Age	835	32.3 years	5.9	16–56
Education	835	14.6 years	2.4	9–17
Salary (USD)	835	59,900	26,600	0–129,000

cal Journal Editors, which accepts all clinical research studies (whether proposed, ongoing, or completed), providing content validation and curation, as well as the unique identification number necessary for publication. All study records in the database are freely accessible and searchable. ISRCTN supports transparency in clinical research, helps reduce the selective reporting of results, and ensures an unbiased and complete evidence base. The study was approved by the Norwegian Regional committee for Medical and Health Ethics South East (REC no. 2011/560), and complied with the Declaration of Helsinki ethical principles for research involving human participants.

3.2 | Demographics

Sociodemographic variables were completed for both parents-to-be and included age, parity, education, and income. A total of 56% were first-time fathers ($N = 481$), 33% were second-time fathers ($N = 283$), whereas 11% ($N = 96$) had two or more previous children. The mean age was 32 years, 37% ($N = 320$) were mainly educated at the university level, 30% ($N = 260$) had 4 years in college, and 32% ($N = 280$) were educated at the high school level or less. Thirty-four percent ($N = 291$) had a median annual personal income that ranged from the equivalent of \$48,800 to \$81,000, whereas 14% ($N = 128$) had a lower and 51% ($N = 441$) a higher personal income. Income values were rated from “0” (*no income*) to “9” ($\geq \$114,000$). The majority of the men were either married ($N = 311$, 35%) or cohabitating ($N = 552$, 62%), whereas the remaining fathers were classified as single, divorced, or other. We asked the participants whether they were ethnic Norwegian or not, and 90% of the fathers reported that they were of Norwegian ethnicity ($N = 819$), and the last 10% included participants with various ethnic backgrounds, including those from Nordic countries (see Table 1). Last, we provided all questionnaires that already were existing in English in order to include those who did not understand Norwegian.

3.3 | Measures

The following questionnaires administered during pregnancy were included in the analyses: Adverse Childhood

Experiences Questionnaire (ACE scale; Anda, Butchart, Felitti, & Brown, 2010), Experiences in Close Relationship Questionnaire (ECR; Brennan et al., 1998), Pregnancy-related Anxiety Questionnaire-revised (PRAQ-R; Huizink, Mulder, Robles de Medina, Visser, & Buitelaar, 2004), and The Edinburgh Postnatal Depression Scale (EPDS; Eberhard-Gran, & Slinning, 2007).

At 6 and 12 months after birth, the Parenting Stress Index (PSI), Child Domain (PSI; Abidin, 1995) was included, and the EPDS was administered again. Also, the partner domain (a subscale of the PSI parent domain; Abidin, 1995) was included. The total score on the child domain (PSI) was used as the main outcome variable at 12 months, and is denoted as *perceived child behavior*. All measures and self-reported variables were coded on Likert scales (Judd, Smith, & Kidder, 1991), from “lower” to “higher” levels of stress.

3.4 | Measures during pregnancy

The Adverse Childhood Experiences Questionnaire (the ACE scale) was completed at enrollment, generally early in pregnancy, and was based upon fathers' recalled perceptions of their own childhood experiences. It is a self-report retrospective questionnaire designed to identify possible ACE consisting of 10 questions, each scored 0 or 1, hence yielding a composite score ranging from 0 to 10 (Anda et al., 2010). This questionnaire comprises queries about recurrent physical and emotional abuse, such as “Did a parent or other adult in the household often swear at you, insult you, put you down, or humiliate you?” or “Did a parent or other adult in the household often push, grab, slap, or throw something at you?” In the present study, the fathers' composite scores varied from 0 to 9 ($M = 0.52$, $SD = 1.14$). We used ACE as a latent variable, whereas its composite score had good internal reliability ($\alpha = 0.72$). The ACE scale has been used in studies of lasting negative effects of ACE on physical health (Anda et al., 2006), brain development (McEven & Gianaros, 2010), and mental health (Maughan, Cicchetti, Toth, & Rogosch, 2007).

The Experiences in Close Relationship Questionnaire (ECR) is a 36-item self-report measure of adult attachment style. It was derived from a factor analysis of 60 constructs, represented by 482 items extracted from a thorough literature search of previous attachment measure research (Brennan et al., 1998). From this survey, an instrument was constructed based upon the two primary dimensions of avoidance of intimacy and anxiety with abandonment. Each dimension consists of 18 claims, with each scored 1 = *not true* to 7 = *true*, yielding a mean score ranging from 1 to 7 (Brennan et al., 1998). In the present study, fathers' mean avoidance scores varied from 1 to 4.56 ($M = 1.80$,

$SD = 0.68$), and their mean anxiety scores varied from 1 to 6.22 ($M = 2.13$, $SD = 0.81$). The questionnaire contained questions, such as “I prefer not to show a partner how I feel deep down” (avoidance), and “I worry about being abandoned” (anxiety). The composite score of both dimensions had good internal reliability (avoidance, $\alpha = 0.79$; anxiety, $\alpha = 0.85$). Elevated scores on these dimensions reveal avoidance and discomfort with closeness (ECR avoidance), as well as anxiety, jealousy, and fear of rejection (ECR anxiety) (Brennan et al., 1998). An anxious attachment style is reflected in the fear of romantic partners being unavailable and unreliable (Mikulincer & Shaver, 2007), which is related to greater parenting stress (Fernandez, Muller, & Rodin, 2012). Also, ECR has been used to show that adult romantic attachment is an important prenatal determinant of parental attachment and parenting alliance (Luz et al., 2017).

The Pregnancy-related Anxiety Questionnaire-Revised (PRAQ-R) was originally used to measure specific fears and worries related to pregnancy in women. It is a 10-item questionnaire designed to assess ongoing anxiety related to pregnancy and forthcoming birth (Huizink et al., 2004). In this study, using the scale for fathers, it was reduced by three items to make it more suitable to assess men's possible pregnancy-related stress. The questionnaire originally includes questions related to change in body perception after birth, fear about gaining weight, and anticipated pain in the process of birth. These questions were removed from the questionnaire; consequently, the PRAQ-R score was based upon seven items instead of 10, making it more applicable for the participating fathers.

The Edinburgh Postnatal Depression Scale (EPDS) is a self-report measure of depressive symptoms developed to assess women postnatally (Luoma et al., 2012). However, it is also considered to be a reliable and valid method to assess depressive symptoms in fathers (Cox & Holden, 2003; Matthey, Barnett, Kavanagh, & Howie, 2001), and to identify women and men at risk for postnatal depression (Edmondson, Psychogion, Vlachos, Netsi, & Ramchandani, 2010). The scale measures mood problems, using statements such as, “In the past seven days, I have felt sad or miserable,” or “In the past seven days, I have been so unhappy that I have been crying.” In the present study, we used the highest obtained scores on the EPDS and PRAQ-R,¹ calculated from the distribution of scores at five time points during pregnancy: PRAQ-R ($M = 16.44$, $SD = 5.75$, range = 7–35) and EPDS ($M = 3.26$, $SD = 3.38$,

¹ Both questionnaires comprised fathers' maximum score at five time points during pregnancy for anxious and depressive symptoms. Feelings may vary during pregnancy for both parents, and the questionnaires, especially the EPDS, is reported upon the present subjective experience within the last week.

range = 0–24). Both PRAQ-R ($\alpha > 0.75$) and the EPDS ($\alpha > 0.73$) had good internal reliability on all five time points during pregnancy. Especially the EPDS is based upon reported experiences in the last week in order to capture the present state of depressive feelings and the PRAQ-R was also denoted likewise to capture present anxious feelings.

3.5 | Measures at 6 and 12 months postpartum

The Parenting Stress Index (PSI; Abidin, 1995) is a 120-item, Likert-type, parent self-report questionnaire comprising a Parent domain, with 54 parent-focused items, a Child Domain with 47 child-focused items, and a Life stress scale, with 18 items. The first two domains were developed in response to needs for a measurement tool to assess salient child and parental characteristics, family context, and the parent–child system (Abidin, 1982).

The Child Domain focuses upon experienced stress in connection with how parents perceive their child's behavioral characteristics, and taps into temperamental characteristics with a long-term predictive power (Korn, 1984). This scale combines salient child characteristics as perceived by the parents and consists of the following six items: distractibility/hyperactivity, adaptability, reinforces parent, demandingness, mood, and acceptability. High scores on the child domain are associated with perceiving the child as displaying qualities that make it difficult for the parent to fulfill the parenting role (Abidin, 1992). It should be noticed that the PSI Child Domain score does not yield information about fathers' actual parenting behavior, but rather their perceptions of the child's behavioral characteristics. In the present study, the child domain total sum score was used as an outcome variable ($M = 90.47$, $SD = 14.49$, range 57–135), and is denoted as “perceived child behavior.” Hence, elevated scores denoted more stress by expressing elevated negative descriptions of one's child's behavior, whereas low scores denoted the opposite (low stress and less negative descriptions).

The spousal domain (or “relationship with spouse”) is a subscale of the Parent Domain and consists of seven items. Elevated scores on this domain are typical of parents who lack the expected emotional and active support in the area of child management (Russ, 1988; Webster-Stratton, 1989). This reflects a more negative relationship (Abidin, 1995; Beckman, 1991), and perceived negative marital quality is also associated with higher levels of parental stress (Lavee, Sharlin, & Katz, 1996). It captures relational negativity and a lack of parental mutual support, which are considered to be symptoms of a dysfunctional relationship (Biernat & Wertman, 1991). The scale had good internal reliability

($\alpha = 0.75$; $M = 14.96$, $SD = 4.17$, range = 7–29); the variable was denoted as “partner disharmony” in the present study, because some parents were not married and instead were co-habiting. The variable was also used as a latent mediating variable. The EPDS was assessed again at 12 months postpartum, and used as a mediating variable ($M = 2.38$, $SD = 2.87$, range 0–18). The composite score used in the present study had a good internal reliability ($\alpha = 0.75$).

4 | STATISTICAL ANALYSES

We employed linear regression models and path analyses for predictors and mediators over time; all predictors were included in the model, and relationships were estimated. The analyses were done in three main steps, in accordance with our primary research aims: First, linear regression from pregnancy with perceived child behavior (PSI child domain) postpartum as an outcome variable at child age 12 months (Table 2); second, path-analysis modeling to investigate mediated pathways (Table 3); and third, we used intraclass correlation analyses between the time points of 6 and 12 months.

The path analysis equations were assessed in one main SEM model, and shown in one table (Table 3) and two figures (Figures 1 and 2) in order to make the presentation of the model clearer. A change in perceived child behavior between 6 and 12 months was investigated by a mixed effects model of child behavior over time, whereas the stability of reported child behavior was estimated by intraclass correlation (ICC) based on a mixed effects model.

Additionally, sensitivity analyses were performed with alternative models. These analyses were done to gain more information concerning causal direction and causal flow (Hayes, 2013). In mediated path analyses, a necessary condition for claiming that an association is cause–effect is to establish that the cause precedes the effect over time. Nevertheless, time order assignments do not necessarily ensure the direction of causal flow, with strong theory precluding the most illogical assignments. In the present study, we followed the proposals of Shrout, Lee, Burroughs, and Rindfleisch (2011), insofar as assessing corresponding alternative models. More specifically, we conducted several analyses by using depressive symptoms and partner disharmony, instead of perceived child behavior as an outcome variable. Subsequently, we compared these alternative models with our primary model, even though the causal directions can still include uncertainty.

To measure the validity of the path analysis models, the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker Lewis index (TLI) were assessed. Values of RMSEA below 0.05 and values of CFI and TLI above 0.95 were all considered

TABLE 2 Linear main analysis of prenatal mental health with perceived child behavior at 12 months postpartum

Item	Estimate	95% Confidence interval	p-value
Parity	-0.20	[-1.98, 1.26]	.800
Age	-0.29*	[-0.55, -0.07]	.027
Education (per year)	-0.02	[-0.68, 0.27]	.937
Salary	0.71*	[0.11, 1.29]	.028
Experiences in close relationships, avoidance	0.40	[-3.13, 2.83]	.820
Experiences in close relationships, anxiety	2.06	[-0.24, 5.95]	.143
Adverse childhood experiences	0.57	[-1.22, 2.83]	.559
Anxious symptoms in pregnancy	0.27**	[0.05, 0.53]	.021
Depressive symptoms in pregnancy	-0.10	[-0.61, 0.21]	.623
Depressive symptoms at 12 months	-1.62	[-4.94, 0.56]	.241
Partner disharmony at 12 months	10.85***	[8.27, 13.89]	<.001

Note. The table shows unstandardized coefficients. *P*-values were based upon normal approximation and confidence intervals were based upon bootstrapping with 10,000 replications.

p* < .05; *p* < .01; ****p* < .001 (two-tailed).

TABLE 3 Main path analysis of prenatal predictors of perceived child behavior at 12 months

Item	Estimate	95% Confidence interval	P-value
Adverse childhood experiences via Depressive symptoms in pregnancy Spousal disharmony	0.21*	[0.06, 0.48]	0.044
ECR avoidance via Spousal disharmony	5.70***	[3.49, 8.37]	<0.001
ECR anxiety via Anxious symptoms in pregnancy Spousal disharmony	0.63*	[-0.09, 1.25]	0.061
ECR anxiety via Depressive symptoms in pregnancy Partner disharmony	0.57**	[0.26, 1.15]	0.007

Note. The table shows unstandardized coefficients. *P*-values were based upon normal approximation and confidence intervals were based upon bootstrapping with 10,000 replications.

p* < .05; *p* < .01; ****p* < .001 (two-tailed).

Abbreviation: ECR, Experiences in Close Relationships Scale.

to denote a well-fitting model (Browne & Cudeck, 1992; Hu & Bentler, 1999). We estimated measurement models for prenataly reported ACE and ECR, as well as for EPDS, and the spousal domain reported at 12 months postpartum. Confidence intervals were computed as bootstrap bias-corrected intervals based on 10,000 replications, and significant results were determined by *p* < .05. For mediated relationships, significance was determined by bootstrap confidence intervals, which are considered more reliable, compared to *p*-values based on a normal approximation for mediated effects (Hayes, 2013).

At first, none of the models converged properly, as ACE retrospectively reported in pregnancy and EPDS at 12 months left us with zero cells, which made the model unstable. The technique of parceling was therefore used

for the ACE and EPDS at 12 months, leaving us with five sum scores for both latent variables instead of the 10 original items. Parceling followed the recommendations from Little (2013); they were ordered by their item-to-total correlation, and, iteratively, remaining items with the highest and lowest item to total correlations were parceled together, thereby resulting in a good internal reliability of the composite score for ACE ($\alpha = .73$) and EPDS ($\alpha = .82$). Also, the variables derived from the child domain with latent variables made the model unstable, so we therefore decided to use it as a composite sum score instead ($M = 90.5$, $SD = 14.49$, range 57–135). The preliminary regression analyses were assessed with SPSS version 24 (IBM SPSS Statistics 24). ICC based on the mixed effects analyses used the R (The R Foundation for Statistical

Computing, Vienna, Austria, 3.0.0 package nlme [Pinheiro, Bates, DebRoy, Deepayan, & The R Development Core Team, 2013]), whereas the path analyses used the Mplus program, Version 8, using a robust weighted least squares estimation (Muthén & Muthén, 1998–2017).

5 | RESULTS

First, we needed to clarify model fit. This is important in order to evaluate the appropriateness and validity of the findings from the models. The path analysis with perceived child behavior as the outcome variable at first denoted a poor model fit (RMSEA = .046, CFI = .907, and TLI = .902). The model fit was slightly improved by adding five correlations: between ECR avoidance and ACE ($r = .22^2$), between ECR anxiety and ACE ($r = .27$), between ECR avoidance and ECR anxiety ($r = .64$), between anxious and depressive symptoms in pregnancy ($r = .21$), and between partner disharmony and depressive symptoms postpartum ($r = .48$). Additionally, we added two correlations between single items in the ECR avoidance and three correlations between single items in the ECR anxiety. After this, the model acquired an improvement in fit (RMSEA = .042, CFI = .922, and TLI = 0.917). Second, the assessment of the supplementary sensitivity analyses using partner disharmony as the outcome had a rather poor model fit (RMSEA = .045, CFI = .909, and TLI = .904). Modifications and efforts to improve the model fit were assessed, adding the same corresponding 10 correlations with the same estimates as in the main model, and also between perceived child behavior and depressive symptoms postpartum (.17). This procedure yielded an improved model fit (RMSEA = .042, CFI = .922, and TLI = .917). Last, the assessment of the supplementary sensitivity analyses using depressive symptoms as the outcome at first denoted a poor model fit (RMSEA = .046, CFI = .908, and TLI = .902). It was improved by adding the same corresponding 10 correlations as in the main model, and also between perceived child behavior and partner disharmony (.49), hence resulting in an improvement in model fit (RMSEA = .042, CFI = .922, and TLI = .917).

5.1 | First aim: Direct antecedents of perceived child behavior

Table 2 shows linear regression analyses in order to investigate the direct predictions between prenatal predictors and

perceived child behavior postpartum, according to our first aim. The estimation shows that anxious symptoms in pregnancy and partner disharmony postpartum significantly predicted perceived child behavior at 12 months postpartum. ACE, attachment style, and depressive symptoms, both during and after pregnancy, did not directly predict perceived child behavior postpartum significantly. Fathers' perceived child behavior explained a total of 38% ($p < .001$) of the total variance.

5.2 | Second aim: SEM analyses with mental health and spousal disharmony as mediators

Table 3 and Figures 1 and 2 show the results of the path analyses of predictors assessed prenatally and perceived child behavior at 12 months postpartum, according to our second aim. The mediation analyses had three primary findings: First, ACE significantly predicted perceived child behavior via depressive symptoms in pregnancy and partner disharmony postpartum (depicted in Figure 1).

Second, attachment avoidance significantly predicted perceived child behavior, mediated by partner disharmony at 12 months postpartum. Third, attachment anxiety significantly predicted perceived child behavior via two pathways: (a) via depressive symptoms in pregnancy and partner disharmony and (b) via anxious symptoms in pregnancy and partner disharmony (see Figure 2). Depressive symptoms postpartum did not significantly mediate the estimated predictions.

5.3 | Third aim: The stability of fathers' child perceptions

Based upon our third aim, we found no significant difference in perceived child behavior between 6 and 12 months (difference 0.86, 95% CI [-0.20, 1.92], $p = .115$), with a strong intraclass correlation estimate of .68.

5.4 | Do competing causal orders in the pathways provide alternative explanations?

The following analyses were done using partner disharmony and depressive symptoms postpartum as outcome variables, instead of perceived child behavior. ACE did not significantly predict partner disharmony, mediated by depressive symptoms in pregnancy, as was the case with perceived child behavior in the main analyses. ECR avoidance significantly predicted partner disharmony, mediated by perceived child behavior, whereas ECR anxiety significantly predicted partner disharmony, mediated by

²All five correlations added in the assessed pathways to improve model fit were significant ($p < .001$).

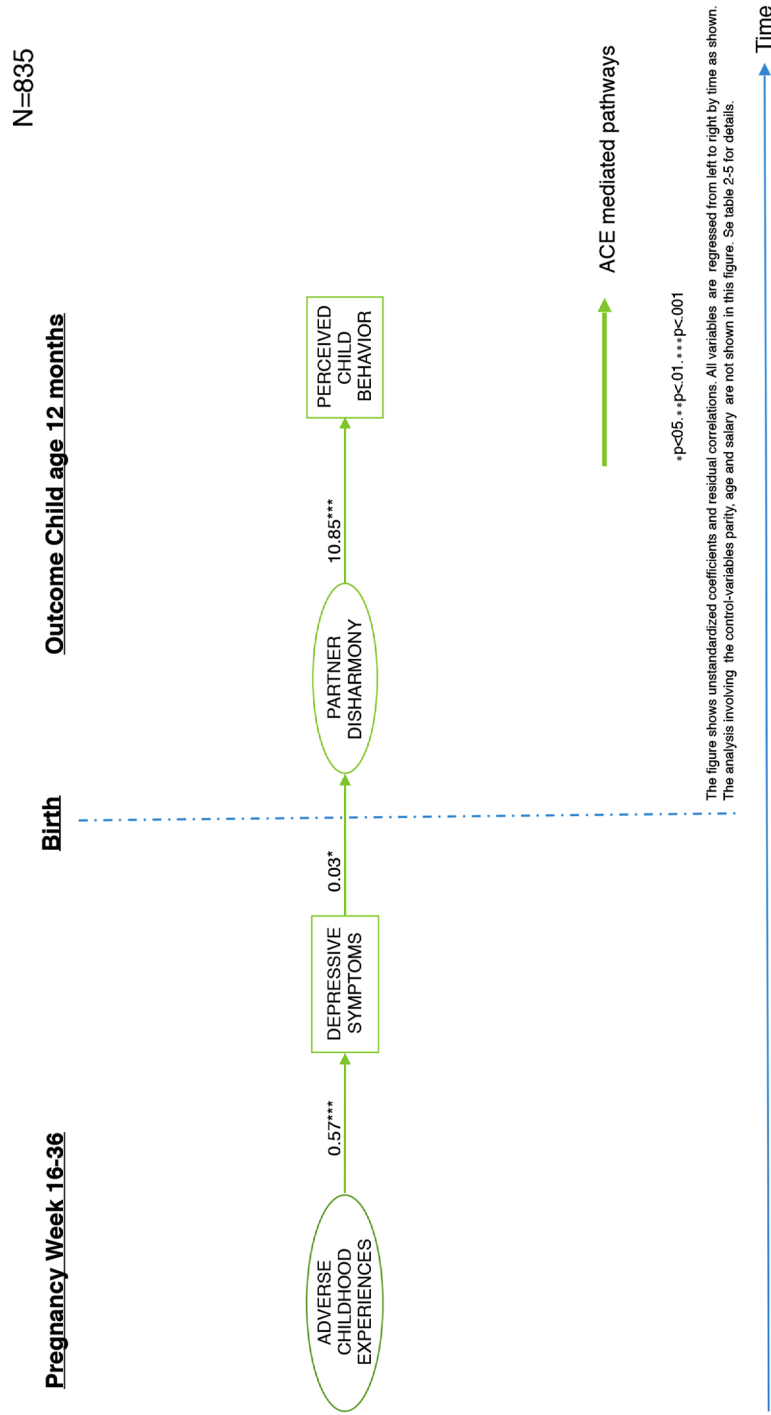


FIGURE 1 Adverse childhood experiences in path analysis for perceived child behavior at 12

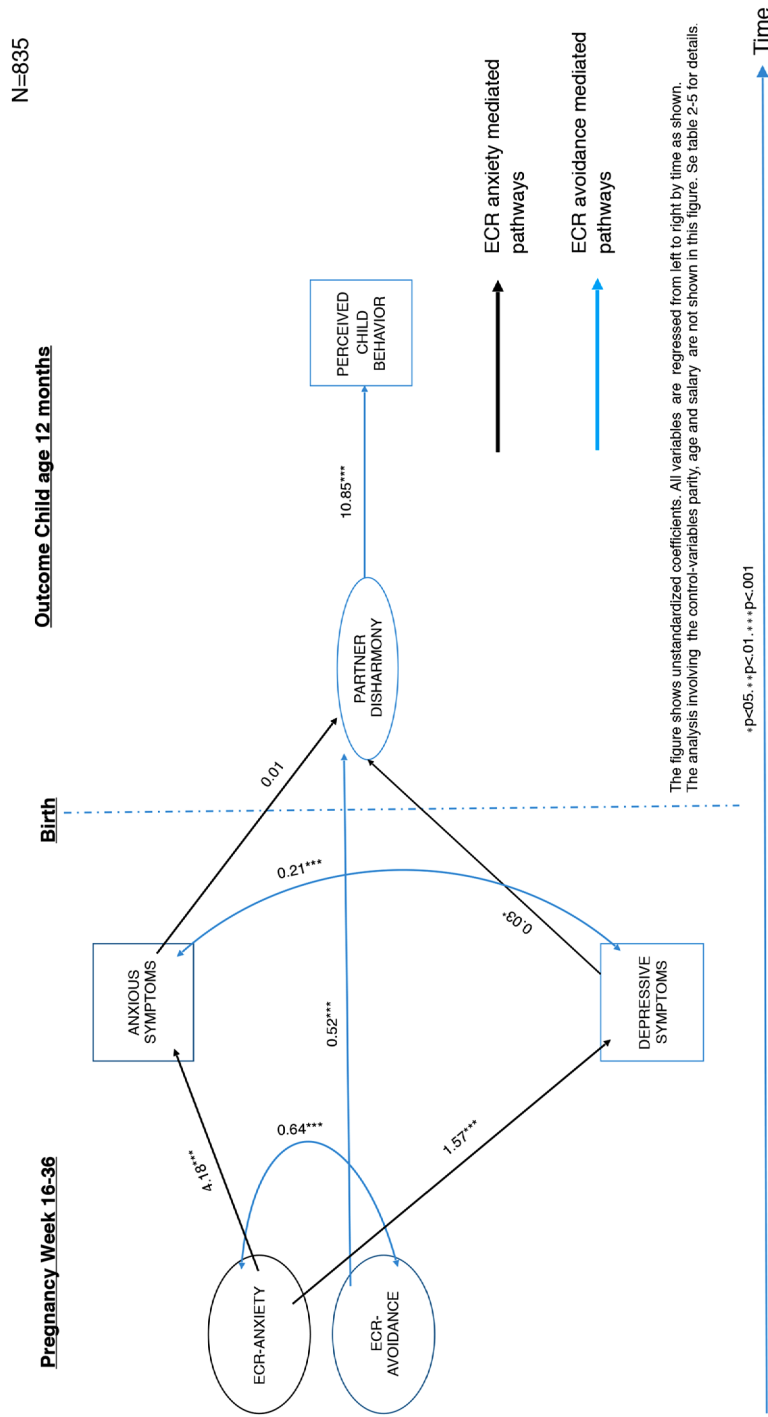


FIGURE 2 Partner attachment style (avoidance and anxiety) path analysis for perceived child behavior at 12 months

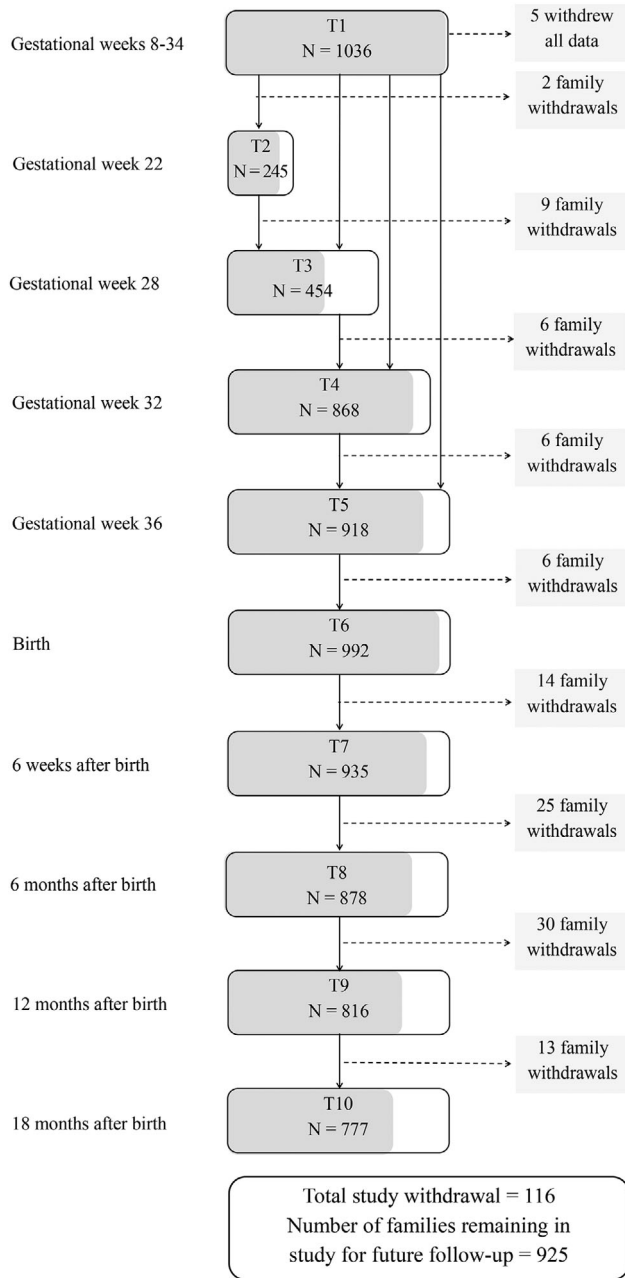


FIGURE 3

anxious symptoms in pregnancy and perceived child behavior. Also, no significant pathways were found from the prenatal predictors toward depressive symptoms as an outcome variable at 12 months.

The estimates of the supplementary sensitivity analysis using partner disharmony and depressive symptoms as outcome variables were lower when compared with perceived child behavior as an outcome variable, even though some of these estimated findings were significant. Stronger predictor estimates in our main model, compared with the findings from our supplementary models, support and strengthen causal flow arguments.

6 | DISCUSSION

The present study aimed to expand prior research and investigated whether prospective fathers' own ACE and their attachment style assessed during pregnancy predict fathers' perception of their child's behavioral characteristics at 12 months postpartum. It also aimed to analyze if fathers' mental health and relationship with their partner mediate the findings from our first aim. Last, it investigated the stability of such perceptions during the child's first year of life, between child age of 6 and 12 months.

The results from the present study add to the extant knowledge about various paternal dynamic trajectories to mental health, partner attachment, partner relational quality, and the attribution of the child's behavior during the early parenthood period. Antecedent factors present already before the child is born influence fathers' mental health during pregnancy and how a father perceives his child's behavioral characteristics in infancy, showing that such attributions are mediated and prevail over time.

The present study provides an analysis of prospective fathers' emotional experiences in the transition period to parenthood, and how they perceive their child's behavior 12 months postpartum. Our first hypothesis, namely, that fathers' retrospectively reported ACE and attachment style assessed in pregnancy would directly predict perception of their child's behavior at 12 months postpartum, was not supported. However, we did find indirect pathways supporting our second hypothesis; ACE and attachment style both significantly predicted perceived child behavior via anxious and depressive symptoms in pregnancy and partner disharmony postpartum. We also found that the attachment styles (avoidant and anxious) predicted perceived child behavior via two different pathways: first, via anxious and depressive symptoms during pregnancy; and second, via partner disharmony postpartum (anxious attachment style) and via partner disharmony (avoidant attachment style). Depressive symptoms postpartum did not significantly mediate between the predictor and outcome. Our third hypothesis, that fathers' perception of child behavioral characteristics would be stable from child age 6 to 12 months, was supported, thereby suggesting that fathers' perceptions of their child's behavior are little affected by a time lag of 6 months in the child's first year of life.

The overall findings add to the extant knowledge that fathers' own childhood experiences, mental health, and their partner attachment style before fatherhood are concordantly associated and further associated with their experiences of parenting stress after birth. Also, the findings show that spousal disharmony after child birth contributed to paternal stress and a negative perception of the child's behavioral characteristics.

6.1 | Fathers' ACE and perceived child behavior at 12 months postpartum

In this study, we found that the association between fathers' retrospectively reported ACE and perception of their child's behavior at 12 months postpartum was mediated by depressive symptoms in pregnancy and partner disharmony (which is in line with our second assumption), but not significantly mediated by depressive symptoms at 12 months postpartum. This means that fathers' ACE express their effect via depressive symptoms in pregnancy and partner disharmony postpartum.

In the case of the mediation role of depressive symptoms, depression status has been found to affect the reporting of past depressive episodes and past traumatic events, so it is possible that the memory of a past negative event may be more accessible, and even overreported during a depressive episode (Schraedley, Turner, & Gotlib, 2002). Yet, even though such mood-congruent reporting may lead to retrieval biases and cognitive distortions of past experiences, longitudinal follow-up studies of adults whose childhood abuse has been documented through records and interviews have shown that retrospective reports of childhood abuse were likely to underestimate, rather than overestimate, the actual occurrence of abuse (Femina, Yeager, & Lewis, 1990; Williams, 1995).

Regarding depressive symptoms and partner disharmony, Fraiberg, Adelson, and Shapiro (1975) used the expression "ghost in the nursery" to describe how a mother's own past could intrude on—and impair the infant–mother relationship in an "unguarded moment"—mothers reenacting a moment or a scene from another time with another set of characters in the current relationship. Fraiberg implied that past conflicts and impaired relationships may interfere with the present relationship with the child, a notion that lends support to the present study; past adverse relationship experiences lead to more negative child perceptions when the father experiences depressive symptoms. Fonagy, Steele, and Moran (1993) also found that the security in the infant's relationship with the parents, assessed at 12 and 18 months, could be predicted on the basis of qualitative aspects of the parents' accounts of their own childhoods collected prenatally, hence indicating an intergenerational transfer. Even though Fraiberg focused on mother's ghost, Barrows (2004) also had thoughts about this issue; he underscored that it is not so much whose ghost it is, whether it belongs to the father or the mother, but instead the nature of the interaction that then ensues between the parents. He also paid attention to the relationship between the parents and their interaction in creating the emotional climate within which the infant is born.

We know that men's childhood experiences with their parents, their current relationship with their partner, and demographic events are all factors that can influence fathers' involvement during pregnancy (Flykt et al., 2009) and in their child's infancy (Shannon, Tamis-LeMonda, & Cabrera, 2006). It is therefore likely that an elevation of ACE also influences partner harmony, because a key marker for engagement and involvement in child caregiving is the quality of marital relationships (Cabrera, Fagan, & Farrie, 2008). Reliable and active positive support from one's partner may improve parents' psychological and relational satisfaction, hence enhancing parenting ability (Vismara et al., 2016). Nevertheless, it may be more critical for the developing infant's future mental health to perceive the characteristics of the parental couple than to glimpse the father's individual role (Barrows, 2004). Gaining knowledge of the father's adverse childhood background, in addition to the mother's, before the child is born may provide information about how they will actually parent and perceive their child.

6.2 | Fathers' antenatal attachment style and later perceived child behavior

We did not detect a direct significant association between paternal attachment styles assessed in pregnancy and later perceived child behavior postpartum. Still, we did find that fathers' attachment style assessed prenatally was tracked via three different pathways toward perceived child behavior postpartum. First, we found that an avoidant attachment style predicted perceived child behavior via partner disharmony at 12 months postpartum. Second, we found that anxious attachment style significantly predicted perceived child behavior via anxious symptoms in pregnancy and partner disharmony, and third, via depressive symptoms in pregnancy and partner disharmony. Depressive symptoms postpartum did not significantly mediate the relationships.

Nelson-Coffey et al. (2017) suggested that an insecure attachment style measured in pregnancy may be related to an emotional deactivation and less trust or feeling less reliable in one's close relationships. More specifically, and in line with our findings concerning the first avoidant attachment style pathway, Nelson-Coffey and colleagues found that attachment avoidance was associated with elevated negative emotion and reduced positive emotion and meaning in life. They also stated that an avoidant attachment style leads to less parenting joy in infancy. Other research has shown that parents high in attachment avoidance tend to report more stress in the transition to parenthood (Rholes, Simpson, & Friedman, 2006). Our results concur with Nelson-Coffey et al.'s findings: heightened

levels of the avoidant attachment style and also an anxious attachment style (in line with our second pathway) were both found to be associated with negatively perceived child behavior and more stress. Interestingly, Coffey and colleagues measured attachment style postpartum, and included both parents in their sample, whereas we assessed attachment style during pregnancy toward fatherhood in child infancy and based the findings solely on fathers.

Genesoni and Tallandini (2009) described how the prenatal period was experienced as more stressful compared with stress experienced in the postnatal period. They found that parental psychopathology symptoms during pregnancy were a risk factor for elevated psychosocial stress in parents across the transition to parenthood. This finding was supported by Perren et al. (2005), who found that perceived child difficulty was associated with elevated levels of psychosocial stress. These data justify our hypotheses concerning the mediating role of mental health during pregnancy, specifically that between insecure attachment style and perceived child behavior in fatherhood. Previous research has found that both attachment styles (avoidance and anxiety) are linked with more negative perceptions of the parent–child relationship (Jones et al., 2015), such as feeling disliked by one's child (Berlin et al., 2011).

Furthermore, and in line with our second hypothesis, both anxious and avoidant attachment styles have been found to be significantly related to anxiety disorders in a clinical sample (Picardi et al., 2013). Picardi and colleagues state that attachment relationships (such as the ECR in our study), stressful experiences (such as the ACE in our study), and physiological stress regulation are linked, and that attachment activation follows the stages of detecting and processing fear-related cues and anxiety states. Moreover, they state that affect regulation strategies are acquired in the interpersonal context of early and lasting attachment relationships and are relevant for understanding the nature and development of anxiety disorders. Other researchers have also found that antenatal adult romantic attachment, marital quality, and psychological distress significantly determined parental attachment and parental alliance (Luz et al., 2017). Even though Luz's study used a clinical sample, their findings support our conclusion that an elevated anxious attachment style predicts negatively perceived child behavior via anxiety in pregnancy during the transition to parenthood. It has also been found that secure adult attachment predicts a better antenatal attachment style and more positive child perceptions postpartum among first-time mothers (Priel & Besser, 2000). This lends support to the present study's findings regarding men and fathers.

Also, and in line with our second aim, we found that partner disharmony significantly acted as a media-

tor between prenatal attachment style and negatively perceived child behavior. It has been shown that marital conflicts may have an adverse impact on parent–infant bonding, and that fathers' prenatal marital withdrawal is associated with a more negative affect and detachment in family interactions, including child interaction (Paley et al., 2005). Likewise, Lundy (2002) reported that marital dissatisfaction adversely affected paternal synchrony and the security of father–infant bonding. Fathers seem to be consistently more involved in interaction with their infants when they and their partners have supportive attitudes toward paternal involvement. The literature also highlights the notion that when fathers engage in caregiving activities, there are few differences between child–mother and child–father relationships (Parke & Asher, 1983).

6.3 | The stability of fathers' behavioral child perception

Our final expectation, that fathers' perception of child behavioral characteristics would be stable from child age 6 to 12 months, was supported, thus suggesting that fathers' perceptions of their child's behavior are little affected by a time lag of 6 months. This finding concurs with previous research on mothers, showing that their perceptions of infant characteristics are moderately stable from pregnancy to postpartum (Zeanah et al., 1985). Related to the issue of stability of child behavioral perception, it has been shown that fathers' course of anxiety and depression (Leach et al., 2016; Vismara et al., 2016) between pregnancy and postpartum is stable, and that there is an association between involvement in pregnancy and engagement with the child after birth (Cabrera et al., 2008), suggesting stability in fathers' dedication with the child over time. The stability of fathers' personal characteristics from pregnancy toward fatherhood seemingly acts in concert to shape paternal perceptions of the infant, which then again may affect child development over time.

7 | STRENGTHS AND LIMITATIONS

This study investigates the antecedents of fathers' perceived child behavior measured during pregnancy, and their associations with mediators across time after birth. There are few studies comprising pathways with dynamic mediator transitions between ACE and partner attachment style during pregnancy, and how fathers perceive their child after birth in the transition period from pregnancy to a child age 12 months. Another study (Skjothaug et al., 2018) has shown that fathers' ACE retrospectively reported in pregnancy predicted perceived child behavior

at 6 months postpartum. In the current study, we used a longitudinal design, assessing predictors in direct relationships with outcome, and also indirectly via mediating variables. Even so, it should be noted that former studies of fathers have described multiple developmental pathways that change over time, such as in studies on the etiology of aggression, self-regulation, cognitive development and executive functions, and child conduct and poverty (the Pittsburgh Study: Shaw et al., 2016), as well as in studies of fathers' alcoholism and child developmental processes (the Buffalo Longitudinal Study: Eiden, Colder, Edwards, & Leonard, 2009) and the developmental origins of fathers' alcohol disorder (The Michigan Longitudinal Study: Puttler, Fitzgerald, Heitzeg, & Zucker, 2017). The current study adds to the literature by including antenatal antecedents of perceived child behavior.

In this study, we also assessed symptoms levels by means of continuous variables, rather than by using symptom cutoff scores. This approach suggests that even minor changes in variable values can influence the other measures. We aimed to strengthen the study design by preventing the loss of information using a continuous variable approach, rather than variables with diagnostic cutoff scores.

This study has several limitations. First, to the best of the authors' knowledge, few studies have previously used PRAQ-R with fathers (Skjothaug et al., 2014). As a result, our findings cannot easily be compared with other studies of anxious fathers. Nonetheless, by removing the items that were unsuitable for fathers, we made it more available for addressing men's and fathers' pregnancy-specific anxiety. Huizink et al. (2017) showed that pregnancy-specific stress predicted all parenting stress constructs after controlling for life events and birth-related factors. It is likely that prospective fathers with a worried mind during pregnancy continue to worry about their newborn baby, and are therefore more vulnerable for experiencing parenting stress postpartum, which is concordant with Huizink's findings. Consequently, by including symptoms of fathers' anxiety in the research design, we aimed to extend knowledge of fathers' mental health, especially because such knowledge during pregnancy is fairly sparse.

Second, using EPDS as a valid measure for fathers, in addition to employing a self-report method, has been questioned (e.g. Brownhill, Wilhelm, Barclay, & Schmied, 2005; Matthey et al., 2001; Melrose, 2010). The critique has focused upon the possibility that EPDS does not account for typical male "externalizing" strategies when fathers are depressed, such as drug and alcohol abuse, road rage, aggression, suicide, risk-taking behaviors, cynicism, avoidance of social situations, and having affairs. Depression may look different among men than women

because the symptoms might be "hidden" through the expression of irritability, anger, or withdrawal (Cochran & Rabinowitz, 2000). In this vein, Massoudi, Hwang, and Wickberg (2013) argue that EPDS may be a general measure for assessing men's distress, rather than depression. Hence, an important notion for future research is the caveat pointed out by Kim and Swain (2007), to the effect that there is not yet an official set of diagnostic criteria for paternal postpartum depression in infancy; research so far uses depressive measures for fathers developed for maternal postpartum depression. Also, self-report measures are subject to response biases, and heavily rely on the respondent's honesty and self-insight, which could be limited in any case, particularly when fears and defenses are an issue (Brennan et al., 1998). Moreover, the use of self-report symptom measures may not yield information about the participants' possible clinical mental disorder (Figueiredo and Conde (2011). Additionally, several studies have found that proximal predictors of parenting (e.g., current depression) are less powerful than a parent's report of the way in which he or she was parented in childhood (Caspi & Elder, 1988). ACE seems to express its effect with the outcome indirectly via depressive symptoms, not directly.

We also used fathers as single informants, though using multiple informants and methods may ensure a better validity (Shadish, Cook, and Campbell (2002). A challenge in reporting ACE correctly is the retrospective nature of the measure. One may therefore question the reliability of recalled memory of the father's own childhood past because time may influence memory retrieval. However, retrospective reports of childhood abuse have been shown to be more subject to underestimation, as opposed to overestimation about the actual occurrence of abuse (Femina et al., 1990; Williams, 1995).

Third, the participants were voluntarily recruited, and we may have oversampled well-functioning fathers. The voluntary nature of the participation may have led to a selection bias; women and men who agreed to participate could be those who presented fewer anxious and depressive symptoms. Also, the present paper did not differentiate fathers with various ethnic backgrounds, other than being ethnic Norwegian or not. Future studies may expand the present study's findings by exploring and comparing fathers belonging to other cultures than the ones mentioned, and also include other languages than Norwegian and English in the design.

Fourth, it may be that fathers perceive more stress with girls than with boys; that with a same gender child it may be easier to recognize the needs of the child because of the parent's own experiences (Lam, McHale, & Crouter, 2012). Hence, future research on this issue should investigate whether fathers' perception of their

daughters differs from their perception of the sons' behavioral characteristics.

8 | CONCLUSIONS AND CLINICAL IMPLICATIONS

The present findings suggest that how fathers perceive their children's behavior when their age is 12 months can be partly predicted. Their reports, already measured before the child is born, suggest that the father's own ACE, attachment style, and mental health are all important factors to consider when providing support to the families in need of aid. Especially, because previous research has suggested that parenting stress negatively influences parenting behavior, which in turn has been found to affect children's development (Crnic, Gaze, & Hoffman, 2005). We also found that fathers' perceptions of their child's behavioral characteristics are stable from 6 to 12 months, which adds to the extant knowledge about attachment patterns, especially because their negative child perceptions last over time. This study underscores the importance of focusing upon the entire family-to-be, including both fathers and mothers. Barrows (2004) stressed the importance of focusing upon both parents' contribution to child care, and not only the dyadic mother-child relationship. He called attention to the triad and the emotional climate within which the infant is born, rather than each parent's separate contribution.

By experiencing more stress, fathers' struggles in the area of child care are expressed by perceiving their child more negatively (Russ, 1988; Skjothaug et al., 2018; Webster-Stratton, 1989), and also by reporting a more undesirable partner relationship (Abidin, 1995; Beckman, 1991). The father's stress and struggles may constitute threats to his child's development. Increasing the number of risk factors in an infant's background enhances the vulnerability to later psychiatric disorders (Rutter, 2006). Infants prenatally exposed to adversity, such as parental disharmony and parental depression, are at a higher risk for developing social-emotional dysregulation, attachment disorder, and behavioral deviance. Moreover, parents' emotional states tend to be correlated. For this reason, Field et al. (2006) reported that depression among fathers-to-be affects the mother's mood state negatively during pregnancy and is often associated with negative effects on fetal development and neonatal outcomes.

This study provides a rationale for public health interventions, including aid assessment before birth, which may inspire future studies of prospective fathers' emotions in the transition to fatherhood. Well-timed and targeted interventions could interrupt negative effects and instead promote positive developmental cascades, that is,

the cumulative consequences of interactional development (Masten & Cicchetti, 2010).

REFERENCES

- Abidin, R. R. (1982). Parenting stress and the utilization of pediatric services. *Children's Health Care, 11*(2), 70–73. https://doi.org/10.1207/s15326888chc1102_5
- Abidin, R. R. (1990). *Parenting Stress Index-Manual* (2nd ed.). Charlottesville, VA: Pediatric Psychologists Press.
- Abidin, R. R. (1992). The determinants of parenting behavior. *Journal of Clinical Child Psychology, 21*, 407–412. https://doi.org/10.1207/s15374424jccp2104_12
- Abidin, R. R. (1995). *Parenting Stress Index: Professional Manual* (3rd ed.). Odessa, FL: Psychological Assessment Resources.
- Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., ... Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood. *European Archives of Psychiatry in Clinical Neuroscience, 256*(3), 174–186. <https://doi.org/10.1007/s00406-005-0624-4>
- Anda, R. F., Butchart, A., Felitti, V. J., & Brown, D. W. (2010). Building a framework for global surveillance of the public health implications of adverse childhood experiences. *American Journal of Preventive Medicine, 39*, 93–98. <https://doi.org/10.1016/j.amepre.2010.03.015>
- Barrows, P. (2004). Fathers and families: Locating the ghost in the nursery. *Infant Mental Health Journal, 25*(5), 408–432. <https://doi.org/10.1002/imhj.20016>
- Beckman, P. J. (1991). Comparison of mothers' and fathers' perceptions of the effect of young children with and without disabilities. *American Journal on Mental Retardation, 95*, 585–595.
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development, 55*, 83–96. Retrieved from <http://www.jstor.org/stable/1129836>
- Belsky, J., Woodworth, S., & Crnic, K. (1996). Trouble in the second year: Three questions about family interaction. *Child Development, 67*(2), 556–578.
- Benoit, D., Zeanah, C. H., Parker, K. C. H., Nicholson, E., & Coolbear, J. (1997). "Working model of the child interview": Infant clinical status related to maternal perceptions. *Infant Mental Health Journal, 18*(1), 107–121. [https://doi.org/10.1002/\(SICI\)1097-0355\(199721\)18:1<107::AID-IMHJ8>3.0.CO;2-N](https://doi.org/10.1002/(SICI)1097-0355(199721)18:1<107::AID-IMHJ8>3.0.CO;2-N)
- Berlin, L. J., Whiteside-Mansell, L., Roggman, L. A., Green, B. L., Robinson, J., & Spieker, S. (2011). Testing maternal depression and attachment style as moderators of Early Head Start's effects on parenting. *Attachment & Human Development, 2011*; 13, 49–67. <https://doi.org/10.1177/1088868314541858>
- Biernat, M., & Wertman, C. B. (1991). Sharing of home responsibilities between professionally employed women and their husbands. *Journal of Personality and Social Psychology, 60*, 844–860. <https://doi.org/10.1037/0022-3514.60.6.844>
- Bouchard, G. (2014). The quality of the parenting alliance during the transition to parenthood. *Canadian Journal of Behavioral Science, 46*(1), 20–28. <https://doi.org/10.1037/a0031259>
- Bowlby, J. (1969). *Attachment and loss: Vol. I: Attachment*. New York, NY: Basic Books.
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationship* (pp. 46–76). New York, NY: The Guilford Press.

- Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research*, *21*, 230–258. <https://doi.org/10.1177/0049124192021002005>
- Brownhill, S., Wilhelm, K., Barclay, L., & Schmied, V. (2005). 'Big build': Hidden depression in men. *Australian and New Zealand Journal of Psychiatry*, *39*, 921–931. <https://doi.org/10.1080/j.1440-1614.2005.01665.x>
- Cabrera, N., Fagan, J., & Farrie, D. (2008). Explaining the long reach of fathers' prenatal involvement on later paternal engagement. *Journal of Marriage and Family*, *70*(5), 1094–1107. <https://doi.org/10.1111/j.1741-3737.2008.00551.x>
- Cabrera, N. J., Tamis-LeMonda, C. S., Bradley, R. H., Hofferth, S., & Lamb, M. E. (2000). Fatherhood in the twenty-first century. *Child Development*, *71*, 127–136.
- Caspi, B., & Elder, G. H., Jr. (1988). Childhood precursors of the life course: Early personality and life disorganization. In E. M. Hetherington, R. M. Lerner, & M. Perlmutter (Eds.), *Child development in a life span perspective* (pp. 115–142). Hillsdale, NJ: Erlbaum.
- Chang, Y., Fine, M. A., Ispa, J., Thornburg, K. R., Sharp, E., & Wolfenstein, M. (2004). Understanding parenting stress among young, low-income, Africa-American, first-time mothers. *Early Education and Development*, *15*, 265–282. https://doi.org/10.1207/s15566935eed1503_2
- Cochran, S. V., & Rabinowitz, F. E. (2000). *Men and depression: Clinical and empirical perspectives*. San Diego, CA: Academic Press.
- Condon, J. T., Boyce, P., & Corkindale, C. J. (2004). The first-time fathers study: A prospective study of the mental health and well-being of men during the transition to parenthood. *Australian and New Zealand Journal of Psychiatry*, *38*, 56–64. <https://doi.org/10.1111/j.1440-1614.2004.01298.x>
- Cox, J., & Holden, J. A. (2003). *A guide to the Edinburgh Postnatal Depression Scale (EPDS)*. London, UK: Gaskell.
- Crnic, K. A., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: Relations to maternal parenting and child behaviour at age 5. *Infant and Child Development*, *14*, 117–132. <https://doi.org/10.1002/icd.384>
- Easterbrooks, M. A., & Goldberg, W. (1987). Toddler development in the family: Impact of father involvement and parenting characteristics. *Child Development*, *55*, 770–752. <https://doi.org/10.2307/1130126>
- Eberhard-Gran, M., & Slinning, K. (2007). *Nedstemthet og depresjon I forbindelse med fødsel*. Oslo, Norway: Nasjonalt folkehelseinstitutt.
- Edmondson, O. J., Psychogion, L., Vlachos, H., Netsi, E., & Ramchandani, P. G. (2010). Depression in fathers in the postnatal period: Assessment of the Edinburgh Postnatal Depression Scale as a screening measure. *Journal of Affective Disorders*, *125*(1–3), 365–368. <https://doi.org/10.1016/j.jad.2010.01.069>
- Eiden, R. D., Colder, C., Edwards, E. P., & Leonard, K. E. (2009). A longitudinal study of social competence among children of alcoholic and non-alcoholic parents: Role of parental psychopathology, parental warmth, and self-regulation. *Psychological Addictive Behavior*, *23*(1), 36–46. <https://doi.org/10.1037/a0014839>
- Feinberg, M. E., Kan, M. L., & Hetherington, E. M. (2007). The longitudinal influence of co-parenting conflict on parental negativity and adolescent maladjustment. *Journal of Marriage and Family*, *69*(3), 687–702. <https://doi.org/10.1111/j.1741-3737.2007.00400.x>
- Femina, D. D., Yeager, C. A., & Lewis, D. O. (1990). Child abuse: Adolescent records vs. adult recall. *Child Abuse & Neglect*, *14*(2), 227–231. [https://doi.org/10.1016/0145-2134\(90\)90033-P](https://doi.org/10.1016/0145-2134(90)90033-P)
- Fenaroli, V., & Saita, E. (2013). Fear of childbirth: A contribution to the validation of the Italian version of the Wijma Delivery Expectancy/Experience Questionnaire (WDEQ). *TPM Testing, Psychometrics, Methodology in Applied Psychology*, *20*, 1–24. <https://doi.org/10.4473/TPM20.XXXXXX>
- Fernandez, C., Muller, R., & Rodin, G. (2012). Predictors of parenting stress in patients with haematological cancer. *Journal of Psychosocial Oncology*, *30*, 81–96. <https://doi.org/10.1080/07347332.2011.633978>
- Field, T., Diego, M., Hernandez-Reif, M., Figueiredo, B., Deeds, O., Contogeorgos, J., & Ascencio, A. (2006). Antenatal paternal depression. *Infant Behavior and Development*, *29*(4), 579–583. <https://doi.org/10.1016/j.infbeh.2006.07.010>
- Figueiredo, B., & Conde, A. (2011). Anxiety and depression symptoms in woman and men from early pregnancy to 3-months postpartum: Parity differences and effects. *Journal of Affective Disorders*, *132*(1–2), 146–157. <https://doi.org/10.1016/j.jad.2011.02.007>
- Flykt, M., Poikkeus, P., Sinkonen, J., Lindblom, J., Vilksa, S., & Tiitinen, A. (2009). Prenatal expectations in transition to parenthood: Former infertility and family dynamic considerations. *Journal of Family Psychology*, *23*, 779–789. <https://doi.org/10.1037/a0016468>
- Fonagy, P., Steele, M., & Moran, G. (1993). Measuring the ghost in the nursery: An empirical study of the relation between parents' mental representations of childhood experiences and their infants' security of attachment. *Journal of the American Psychoanalytic Association*, *41*(4), 957–989. <https://doi.org/10.1177/000306519304100403>
- Fox, R. A., Platz, D. L., & Bentley, K. S. (1995). Maternal factors related to parenting practices, developmental expectations, and perceptions of child behavior problems. *Journal of Genetic Psychology*, *156*, 431–441. <https://doi.org/10.1080/00221325.1995.9914835>
- Fraiberg, S., Adelson, E., & Shapiro, V. (1975). Ghosts in the nursery: A psychoanalytic approach to the problems of impaired infant-mother relationships. *Journal of American Academy of Child Psychiatry*, *14*(3), 387–421.
- Genesoni, L., & Tallandini, M. A. (2009). Men's psychological transition to fatherhood: An analysis of the literature, 1989–2008. *Birth*, *36*(4), 305–318. <https://doi.org/10.1111/j.1523-536X.2009.00358.x>
- Goulet, C., Bell, L., St-Cyr Tribble, D., Paul, D., & Lang, A. (1998). A concept analysis of parent-infant attachment. *Journal of Advanced Nursing*, *28*(5), 1071–1081.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis. A regression-based approach*. New York, NY: The Guilford Press.
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, *52*, 511–524.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1–55. <https://doi.org/10.1080/10705519909540118>
- Huizink, A., Mulder, E. J. H., Robles de Medina, P. G., Visser, G. H. A., & Buitelaar, J. (2004). Is pregnancy anxiety a distinctive syndrome? *Early Human Development*, *79*, 81–91. <https://doi.org/10.1016/j.earlhumdev.2004.04.014>
- Huizink, A. C., Menting, B., De Moor, M. H. M., Verhage, M. L., Kunseler, F. C., Schuengel, C., & Oosterman, M. (2017). From prenatal anxiety to parenting stress: A longitudinal study. *Archives*

- of *Women's Mental Health*, 20, 663–672. <https://doi.org/10.1007/s00737-017-0746-5>
- Jones, D. J., Cassidy, J., & Shaver, P. R. (2015). Parents' self-reported attachment styles: A review of links with parenting behaviors, emotions, and cognitions. *Personality and Social Psychology Review*, 19, 44–76. <https://doi.org/10.1177/1088868314541858>
- Judd, C. M., Smith, E. R., & Kidder, L. H. (1991). *Research methods in social relations* (6th ed.). Fort Worth, TX: Harcourt Brace The Dryden Jovanovich College Publishing.
- Kim, P., & Swain, J. E. (2007). Sad dads: Paternal postpartum depression. *Psychiatry*, 4, 35–47.
- Korn, S. (1984). Continuities and discontinuities in difficult/easy temperament: Infancy to young adulthood. *Merrill-Palmer Quarterly*, 30, 189–199. Retrieved from <http://www.jstor.org/stable/23086233>
- Lam, C. B., McHale, S. M., & Crouter, A. C. (2012). Parent-child shared time from middle childhood to late adolescence: Developmental course and adjustment correlates. *Child Development*, 83, 2089–2103. <https://doi.org/10.1111/j.1467-824.2012.01826.x>
- Lavee, Y., Sharlin, S., & Katz, R. (1996). The effect of parenting stress on marital quality: An integrated mother-father model. *Journal of Family Issues*, 17(1), 114–135. <https://doi.org/10.1177/019251396017001007>
- Leach, L. S., Poyser, C., Cooklin, A. R., & Giallo, R. (2016). Prevalence and course of anxiety disorders (and symptom levels) in men across the perinatal period: A systematic review. *Journal of Affective Disorder*, 190, 675–686. <https://doi.org/10.1016/j.jad.2015.09.063>
- Little, T. (2013). *Longitudinal structural equation modeling*. New York, NY: Guilford Press.
- Lundy, B. L. (2002). Father–and mother–infant face-to-face interactions: Differences in mind-related comments and infant attachment? *Infant Behavior and Development*, 26, 200–212. [https://doi.org/10.1016/S0163-6383\(03\)00017-1](https://doi.org/10.1016/S0163-6383(03)00017-1)
- Luoma, I., Puura, K. M., Äntymaa, M., Latve, R., Salmelin, R., & Tamminen, R. (2012). Fathers' postnatal depressive and anxiety symptoms: An exploration of links with paternal, maternal, infant and family factors. *Nordic Journal of Psychiatry*, 67(6), 407–413. <https://doi.org/10.3109/08039488.2012.752034>
- Luz, R., George, A., Vieux, R., & Spitz, E. (2017). Antenatal determinants of parental attachment and parenting alliance: How do mothers and fathers differ? *Infant Mental Health Journal*, 38(2), 183–197. <https://doi.org/10.1002/imhj.21628>
- Massoudi, P., Hwang, C. P., & Wickberg, B. (2013). How well does the Edinburgh Postnatal Depression Scale identify depression and anxiety in fathers? A validation study in a population-based Swedish sample. *Journal of Affective Disorders*, 149, 67–74. <https://doi.org/10.1016/j.jad.2013.01.005>
- Masten, A. S., & Cicchetti, D. (2010). Developmental cascades. *Development and Psychopathology*, 22, 491–495. <https://doi.org/10.1017/S0954579410000222>
- Matthey, S., Barnett, B., Kavanagh, D. J., & Howie, P. (2001). Validation of the Edinburgh Postnatal Depression Scale for men, and comparison of item endorsement with their partners. *Journal of Affective Disorders*, 64(2-3), 175–184. [https://doi.org/10.1016/S0165-0327\(00\)00236-6](https://doi.org/10.1016/S0165-0327(00)00236-6)
- Maughan, A., Cicchetti, D., Toth, S. L., & Rogosch, F. A. (2007). Early-occurring maternal depression and maternal negativity in predicting young children's emotions regulation and sociodemographic difficulties. *Journal of Abnormal Child Psychology*, 35, 685–703.
- McBride, B. A., & Rane, T. R. (1998). Parenting alliance as a predictor of fathers involvement: An exploratory study. *Family Relations*, 47(3), 229–236. <https://doi.org/10.2307/584971>
- McEven, B. S., & Gianaros, P. J. (2010). Central role of the brain in stress and adaption: Links to socioeconomic status, health, and disease. *Annals of the New York Academy of Sciences*, 1186, 190–222. <https://doi.org/10.1111/j.1749-6632.2009.05331.x>
- Meibert, C. J., & Kalinowski, M. F. (1986). Parents' expectations and perceptions of infant temperament: Pregnancy status differences. *Infant Behavior and Development*, 9, 321–334. [https://doi.org/10.1016/0163-6383\(86\)90007-X](https://doi.org/10.1016/0163-6383(86)90007-X)
- Melrose, S. (2010). Paternal postpartum depression: How can nurses begin to help? *Contemporary Nurse*, 34(2), 199–210. <https://doi.org/10.5172/conu.2010.34.2.199>
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood - Structure, dynamics, and change*. New York, NY: Guilford Press.
- Moe, V., & Smith, L. (2010). *Little in Norway: A longitudinal population study of infant vulnerability and plasticity from pregnancy to age 18 months*. Retrieved from <http://www.r-bup.no/pages/spedbarnsnettverket-lin>
- Moe, V., von Soest, T., Fredriksen, E., Olafsen, K., & Smith, L. (2018). The multiple determinants of maternal parenting stress 12 months after birth: The contribution of antenatal attachment style, adverse childhood experiences, and infant temperament. *Frontiers in Psychology*, 9, 1987. <https://doi.org/10.3389/fpsyg.2018.01987>
- Musser, A. K., Ahmed, A. H., Foli, K. J., & Coddington, J. A. (2013). Paternal postpartum depression: What health care providers should know. *Journal of Pediatric Health Care*, 27(6), 479–485.
- Muthén, L. K., & Muthén, B. O. (1998–2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Nelson-Coffey, S. K., Borelli, J., & River, L. M. (2017). Attachment avoidance, but not anxiety, minimizes the joys of caregiving. *Attachment & Human Development*, 19(5), 504–531. <https://doi.org/10.1080/14616734.2017.1326060>
- Östberg, M., & Hagekull, B. (2000). A structural modeling approach to the understanding of parenting stress. *Journal of Clinical Child Psychology*, 29(4), 615–625. <https://doi.org/10.1207/S15374424JCCP2904>
- Paley, B., Cox, M. J., Kanoy, K. W., Harter, K. S. M., Burchinal, M., & Margand, N. A. (2005). Adult attachment and marital interaction as predictors of whole family interactions during the transition to parenthood. *Journal of Family Psychology*, 19(3), 420–429.
- Parfitt, Y., Ayers, S., Pike, A., Jessop, D. C., & Ford, E. (2014). A prospective study of the parent-baby bond in men and woman 15 months after birth. *Journal of Reproductive and Infant Psychology*, 32, 441–456. <https://doi.org/10.1080/02646838.2014.956301>
- Parke, R. D., & Asher, S. R. (1983). Social and personality development. *Annual Review of Psychology*, 37, 755–509.
- Pauli-Pott, U., Mertesacker, B., Bade, U., Haverkock, A., & Beckmann, D. (2003). Parental perceptions and infant temperament development. *Infant Behavior and Development*, 26, 27–48. [https://doi.org/10.1016/S0163-6383\(02\)00167-4](https://doi.org/10.1016/S0163-6383(02)00167-4)
- Perren, S., Von Wyl, A., Bürgin, D., Simoni, H., & Von Klitzing, K. (2005). Depressive symptoms and psychosocial stress across the transition to parenthood: Associations with parental psychopathology and child difficulty. *Journal of Psychosomatic Obstetrics & Gynecology*, 26(3), 173–183.
- Picardi, A., Caroppo, E., Fabi, E., Proietti, S., Di Gennaro, G., Mellesesi, N., & Martinotti, G. (2013). Attachment and parenting in

- adult patients with anxiety disorders. *Clinical Practice & Epidemiology in Mental Health*, 9, 157–163.
- Pinheiro, J., Bates, D., DebRoy, S., & Deepayan, S. & The R Development Core Team. (2013) nlme: Linear and nonlinear mixed effects models. R package Version 3.1, 109.
- Priel, B., & Besser, A. (2000). Adult attachment styles, early relationships, antenatal attachment, and perceptions of infant temperament: A study of first-time mothers. *Personal Relationships*, 7(3), 291–310. <https://doi.org/10.1111/j.1475-6811.2000.tb00018.x>
- Puttler, L. I., Fitzgerald, H. E., Heitzeg, M. M., & Zucker, R. A. (2017). Boys, early risk factors for alcohol problems and the development of the self: An interconnected matrix. *Infant Mental Health Journal*, 38(1), 83–96. <https://doi.org/10.1002/imhj.21618>.
- Ramchandani, P. G., Stein, A., O'Connor, T. G., Heron, J., Murray, L., & Evans, J. (2008). Depression in men in the postnatal period and later child psychopathology: A population cohort study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 47, 390–398. <https://doi.org/10.1097/CHI.0b013e31816429c2>
- Rholes, W. S., Simpson, J. A., & Friedman, M. (2006). Avoidant attachment and the experience of parenting. *Personality and Social Psychology Bulletin*, 32, 275–285.
- Rollè, L., Prino, L. E., Sechi, C., Vismara, L., Neri, E., Polizzi, C., ... Brustia, P. (2017). Parenting stress, mental health, dyadic adjustment: A structural equation model. *Frontiers in Psychology*, 8, 839. <https://doi.org/10.3389/fpsyg.2017.00839>
- Roubinow, D. S., Luecken, L. J., Crnic, K. A., & Gonzales, N. A. (2014). Postnatal depression in Mexican American fathers: Demographic, cultural, and familial predictors. *Journal of Affective Disorders*, 152–154, 360–368. <https://doi.org/10.1016/j.jad.2013.09.038>
- Russ, H. G. (1988). The effects of adoption on pre-oedipal mother-child interaction (Unpublished doctoral dissertation). Adelphi University, Garden City, NY.
- Rutter, M. (2006). Implications of resilience concepts for scientific understanding. *Annals of the New York Academy of Sciences*, 1094, 1–12.
- Schraedley, P., Turner, R. J., & Gotlib, I. H. (2002). Stability of retrospective reports in depression: Traumatic events, past depressive episodes, and parental psychopathology. *Journal of Health and Social Behavior*, 43, 307–316.
- Sethna, V., Murray, L., Netsi, E., Psychogiou, L., & Ramchandani, P. G. (2015). Paternal depression in the postnatal period and early father-infant interactions. *Parenting, Science and Practice*, 15(1), 1–8. <https://doi.org/10.1080/15295192.2015.992732>
- Shadish, W., Cook, T., & Campbell, D. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin Company.
- Shannon, J. D., Tamis-LeMonda, C. S., & Cabrera, N. (2006). Fathering in infancy: Mutuality and stability between 8 and 16 months. *Parenting: Science and Practice*, 6, 167–188. <https://doi.org/10.1080/15295192.2006.9681304>
- Shaver, P. R., & Mikulincer, M. (2004). What do self-report attachment measures assess? In W. S. Rholes & J. A. Simpson (Eds.), *Adult attachment: Theory, research, and clinical implications* (pp. 17–54). New York, NY: Guilford Publications.
- Shaw, D. S., Sitnick, S. L., Brennan, L. M., Choe, D. E., Dishion, T. J., Wilson, M. N., & Gardner, F. (2016). The long-term effectiveness of the family check-up on school-age conduct problems: Moderation by neighborhood deprivation. *Developmental Psychopathology*, 28, 1471–1486. <https://doi.org/10.1017/S0954579415001212>
- Shrum, L. J., Lee, J., Burroughs, J. E., & Rindfleisch, A. (2011). An online process model of second-order cultivation effects: How television cultivates materialism and its consequences for life satisfaction. *Human Communication Research*, 37, 34–57. <https://doi.org/10.1111/j.1468-2958.2010.01392.x>
- Singley, D. B., & Edwards, L. M. (2015). Men's perinatal mental health in the transition to fatherhood. *Professional Psychology: Research and Practice*, 46(5), 309–316. <https://doi.org/10.1037/pro0000032>
- Skjothaug, T., Smith, L., Wentzel-Larsen, T., & Moe, V. (2014). Prospective fathers' adverse childhood experiences, pregnancy-related anxiety, and depression during pregnancy. *Infant Mental Health Journal*, 36(1), 104–113. <https://doi.org/10.1002/imhj.21485>
- Skjothaug, T., Smith, L., Wentzel-Larsen, T., & Moe, V. (2018). Does fathers' prenatal mental health bear a relationship to parenting stress at 6 months? *Infant Mental Health Journal*, 39(5), 537–551. <https://doi.org/10.1002/imhj.21739>
- Stern, J. A., Fraley, R. C., Jones, J. D., Gross, J. T., Shaver, P. R., & Cassidy, J. (2018). Developmental processes across the first two years of parenthood: Stability and change in adult attachment style. *Developmental Psychology*, 54, 975–988. <https://doi.org/10.1037/dev0000481>
- Szilagyi, M., Kerker, B. D., Storfer-Isser, A., Stein, R. E. K., Garner, A., O'Connor, G., ... Horwitz, S. M. (2016). Factors associated with whether pediatricians inquire about parents' adverse childhood experiences. *Academic Pediatrics*, 16(7), 668–675. <https://doi.org/10.1016/j.acap.2016.04.013>
- Trentacosta, C. J., Hyde, L. W., Shaw, D. S., Dishion, T. S., Gardner, F., & Wilson, M. (2008). The relations among cumulative risk, parenting, and behavior problems during early childhood. *Journal of Child Psychology and Psychiatry*, 49, 1211–1219.
- Van Holland De Graaf, J., Hoogenboom, M., De Roos, M., & Bucx, F. (2014). Socio-demographic correlates of fathers' and mothers' parenting behaviors. *Journal of Child and Family Studies*, 27, 2315–2327. <https://doi.org/10.1007/s10826-018-1059-7>
- Van IJzendoorn, M. (1995). The association between adult attachment representation and infant attachment, parental responsiveness, and clinical status: A meta-analysis on the predictive quality of the adult attachment interview. *Psychological Bulletin*, 113, 404–410.
- Vismara, L., Rollè, L., Agostini, F., Sechi, C., Fenaroli, V., Molgara, S., ... Tambelli, R. (2016). Perinatal parenting stress, anxiety, and first-time mothers and fathers: A 3- to 6-months postpartum follow-up study. *Frontiers in Psychology*, 7, 938. <https://doi.org/10.3389/fpsyg.2016.00938>
- Ward, M., & Carlson, E. (1995). Associations among adult attachment representations, maternal sensitivity, and infant-mother attachment in a sample of adolescent mothers. *Child Development*, 66, 69–79.
- Webster-Stratton, C. (1989). The relationship of marital support, conflict, and divorce to parent perceptions, behaviors, and childhood conduct problems. *Journal of Marriage and the Family*, 51, 417–430. Retrieved from <http://www.jstor.org/stable/352504>
- Webster-Stratton, C. (1990). Stress: A potential disruptor of parent perceptions and family interactions. *Journal of Clinical Child Psychology*, 19, 302–312.
- Wee, K. Y., Skouteris, H., Richardson, B., MacPhie, S., & Hill, B. (2015). The inter-relationship between depressive, anxiety and

- stress symptoms in fathers during the antenatal period. *Journal of Reproductive Infant Psychology*, 33, 359–373. <https://doi.org/10.1080/02646838.2015.1048199>
- Weissman, S., & Cohen, R. S. (1985). The parenting alliance and adolescence. *Adolescent Psychiatry*, 12, 24–45.
- Williams, L. M. (1995). Recovered memories of abuse in women with documented child sexual victimization histories. *Journal of Traumatic Stress*, 8(4), 649–673.
- Zeanah, C. H., Keener, M. A., Stewart, L., & Anders, T. A. (1985). Prenatal perception of infant personality: A preliminary investigation. *Journal of the American Academy of Child Psychiatry*, 24, 204–210. [https://doi.org/10.1016/S0002-7138\(09\)60449-0](https://doi.org/10.1016/S0002-7138(09)60449-0)
- Zeanah, C., Keener, M., & Anders, T. (1986). Developing perceptions of temperament and their relations to mother and infant behavior. *Journal of Child Psychology, Psychiatry, and Allied Disciplines*, 27, 499–512.

How to cite this article: Skjothaug T, Smith L, Wentzel-Larsen T, Stänicke E, Moe V. Antecedents of fathers' perception of child behavior at child age 12 months. *Infant Ment Health J.* 2020;41:495–516. <https://doi.org/10.1002/imhj.21862>