The Effect of Unpredictable Early Childhood Environments on Parenting in Adulthood

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Life history theory suggests that individual differences in parenting are partially rooted in environmental conditions experienced early in life. Whereas certain conditions should promote increased investment in parenting, unpredictable and/or harsh environments should promote decreased investment in parenting, especially in men. We tested this hypothesis in 3 studies. In Study 1a, we conducted analyses on 112 parents taking part in the Minnesota Longitudinal Study of Risk and Adaptation (MLSRA), all of whom have been continuously studied starting before they were born. Parenting orientations were assessed at age 32 via an interview. Findings showed that experiencing more unpredictability at ages 0–4 (i.e., frequent changes in parental employment status, cohabitation status, and residence) prospectively forecasted more negative parenting orientations among men, but not women. This effect was serially mediated by lower early maternal supportive presence measured at ages 0–4 and insecure attachment assessed at ages 19 and 26. In Study 1b, we replicated these findings on 96 parents from the MLSRA using behavioral observations of their parental supportive presence. In Study 2, we replicated the effect of early-life unpredictability on men's parenting orientations with a sample of 435 parents. This effect was mediated by adult attachment anxiety and avoidance. Across all studies, greater early-life harshness (low socioeconomic status [SES]) did not predict adult parenting outcomes. These findings suggest that greater early-life unpredictability may be conveyed to children through less supportive parenting, which results in insecure attachment representations in adulthood. Among men, this process culminates in less positive adult parenting orientations and less supportive parenting.

Keywords: parenting, early-life stress, social development, life history theory, attachment

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Few events in life rival the importance of raising children. For many, parenting is a source of meaning, purpose, and satisfaction along with occasional anxiety and frustration. When viewed in relation to other mammalian species, human parenting is unique (Clutton-Brock, 1991; Geary, 2000; Kaplan & Lancaster, 2003). We tend to invest heavily in our children, with both parents—and often grandparents—contributing to this effort. Having a strong orientation toward parenting and investing heavily in offspring, however, is not a human universal. Many parents are neglectful, indifferent, and even hostile (e.g., Cicchetti & Rizley, 1981). Such individual differences in parenting have been widely documented, but their source is still being debated (e.g., Belsky & Jaffee, 2006; Klahr & Burt, 2014).

In this research, we consider parenting within the larger context of evolved reproductive strategies. We concentrate on two aspects of parenting: (a) basic orientations to parenting assessed along a positive-to-negative continuum, in which a positive parenting orientation reflects more involved, emotionally connected, and non-hostile attitudes and behaviors toward one's children; and (b) parental supportive presence, which involves providing effective behavioral support to one's children when they need it.

We propose and test a life history model of individual differences in parenting, postulating that experiencing greater unpredictability in early childhood should forecast both a more negative parenting orientation and decreased parental supportive presence in adulthood, especially in men. We also propose a mediating mechanism through which these childhood experiences are carried forward—namely, that exposure to greater unpredictability early in life should be associated with exposure to less sensitive and supportive parenting, which in turn should result in the development of insecure attachment representations in adulthood enroute to generating more negative parenting orientations and decreased parental supportive presence, especially in men. We provide empirical evidence supporting this model using data from the Minnesota Longitudinal Study of Risk and Adaptation (MLSRA; Sroufe, Egeland, Carlson, & Collins, 2005) and a cross-sectional sample of over 400 parents.

Prior prospective longitudinal studies have linked unpredictability in early rearing environments to adult reproductive outcomes such as the number of sexual partners (e.g., Belsky, Schlomer, & Ellis, 2012; Simpson, Griskevicius, Kuo, Sung, & Collins, 2012). The current research is the first to examine how such factors influence parenting and document that men's and women's parenting is differentially susceptible to unpredictable early-life environments. The gender-moderated mechanism we propose is consistent with longstanding developmental models of attachment and reproductive strategies (e.g., Belsky, Steinberg, & Draper, 1991; Chisholm et al., 1993) and with evolutionary models of parental investment (e.g., Trivers, 1972). The current research, therefore, provides a significant and unifying contribution to these literatures.

Antecedents of Positive Parenting

Psychologists have long been interested in the characteristics and precursors of good parenting. This is primarily because certain parenting practices and attitudes are known to influence children's development (e.g., Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). In particular, a combination of warm, involved, and responsive parenting tends to promote many positive outcomes in children (e.g., school achievement; Spera, 2005).

Parenting quality is sensitive to various factors in the immediate macro and micro environment. For example, good parenting is negatively associated with poverty (Conger et al., 2002; McLoyd, 1990, 1998) and positively associated with stable family lives (Belsky & Jaffee, 2006; Cochran & Niego, 2002). In particular, experiences with one's own parents are good predictors of one's own parenting quality in adulthood. For example, analyses done on the large, prospective Dunedin Multidisciplinary Health and Development Study have found that mothers whose parents provided them with more supportive care during childhood and adolescence were rated as more warm and sensitive toward their own 3-year-old children in home observations (Belsky, Jaffee, Sligo, Woodward, & Silva, 2005; Belsky, Hancox, Sligo, & Poulton, 2012). Similarly, in analyses conducted on the longitudinal Oregon Youth Study, fathers who experienced negative discipline practices early in life employed more negative discipline practices on their own 2- to 3-year-old children (Capaldi, Pears, Kerr, & Owen, 2008).

A major limitation of this prior research is the relative dearth of evidence on how particular experiences during the first few years of life impact the development of parenting attitudes and behaviors in adulthood when individuals become parents. These early childhood experiences may play a special role in determining how an individual eventually parents (Sroufe, Coffino, & Carlson, 2010). Another, more fundamental limitation is the scant consideration given to the *why* question: Why, given the importance of parenting for successful reproduction, is the quality of adult parenting sensitive to the environmental context and rearing experiences? We consider whether there might be a deeper evolutionary logic behind "good" and "bad" parenting. To examine this question, we now discuss parenting within the broader context of human evolution.

Parenting From an Evolutionary Perspective

An evolutionary approach to parenting emphasizes both the benefits and the costs of parenting behaviors. Given that repro-

duction is the engine that drives natural selection, an evolutionary perspective is centrally concerned with benefits and costs as they pertain to reproductive fitness. Successful human reproduction has two essential components: (a) creating new offspring (mating); and (b) caring for existing offspring (parenting). The task of creating new offspring requires the expenditure of *mating effort*, which includes finding a suitable mate and persuading her/him to have sexual intercourse (Buss, 2003). The task of caring for offspring requires the expenditure of *parenting effort*, which includes nurturing, protecting, and investing time, effort, and resources in offspring to increase their chances of survival and eventual reproduction (Kaplan & Lancaster, 2003). Both mating and parenting require resources such as time and energy. Because resources are limited, however, there is an inherent tradeoff between allocating resources to mating effort versus parenting effort (Kaplan & Gangestad, 2005).

A stronger emphasis on mating effort in ancestral environments would have resulted in more children, but each child would have received less investment and, consequently, might have been less able to reproduce successfully. One modern manifestation of this is witnessed in individuals who have multiple children outside of monogamous relationships and limited ability to support each child financially. In contrast, a stronger emphasis on parenting effort would have resulted in fewer children, each of whom would have received greater investment. One modern manifestation of this is individuals who delay reproduction until they can invest adequately in their children's education and professional aspirations (Lawson & Mace, 2010).

The evolutionary construct of *parental investment* mirrors the inherent tradeoff between the costs and benefits of parental effort. Parental investment is any parental expenditure (e.g., energy, protection, time, social capital) that benefits an offspring while diminishing the parent's ability to invest in other fitness components (e.g., creating additional children, self-preservation; Clutton-Brock, 1991). Certain individuals invest relatively more time, energy, and effort in their children and give them greater warmth and more loving care. These individuals have a relatively positive attitudinal and behavioral orientation to parenting. Other individuals invest less in their children, but more in other fitness components, such as mating success. These individuals have a less positive attitudinal and behavioral orientation to parenting. An evolutionary approach can help identify the potential sources of these individual differences.

Life History Theory and Reproductive Strategies

Life history theory (LHT) is an evolutionary framework of individual differences. At its core, LHT identifies tradeoffs that organisms make when allocating limited resources to various life tasks, as well as the ecological conditions under which particular resource-allocation strategies tend to have been more favorable (see Kaplan & Gangestad, 2005). A fundamental life history tradeoff is between the number of children produced (offspring quantity) and the amount of investment given to each child (offspring quality) (Kaplan & Lancaster, 2003). This tradeoff is closely aligned with the mating-parenting tradeoff discussed earlier, in that the quantity and quality of children depend on whether an individual allots more resources toward producing children via

mating or improving the state of his or her current children via parental investment.

Resource allocation strategies exist on a slow-to-fast continuum. At the *slow* end of this continuum is a strategy that prioritizes the welfare of one's current children and involves behaviors and psychological dispositions that facilitate this outcome, such as greater parental caregiving, more restricted sociosexuality, later reproduction, lower aggression, and less risk-taking. At the *fast* end of this continuum, in contrast, is a strategy that prioritizes having more children and involves behaviors and psychological dispositions that promote this outcome, such as lower parental caregiving, more unrestricted sociosexuality, earlier reproduction, heightened aggression, and greater risk-taking (Kaplan & Gangestad, 2005). According to LHT, variability in parental investment reflects variability on this fast-to-slow continuum of life history strategies.

In evolutionary fitness terms, the reproductive value of fast versus slow strategies depends on the ecological context in which each strategy is enacted (Ellis, Figueredo, Brumbach, & Schlomer, 2009). Accordingly, individual differences in the amount of resources dedicated to parenting versus mating are "designed" to achieve good, ecologically contingent outcomes with regard to this reproductive tradeoff. This ecological contingency is believed to be a major driver of individual differences in life history strategies in humans, given that ancestral environments differed considerably between and within human societies (Kaplan & Gangestad, 2005). Humans, therefore, facultatively adjust their life history strategies in response to local environmental conditions (Gangestad & Simpson, 2000). As a consequence, environments in which parental investment is important for the survival and long-term well-being of offspring should shift the mating–parenting balance more toward parenting and parental investment, whereas environments in which greater parental investment has diminishing returns should shift the mating-parenting balance more toward mating (Kaplan & Lancaster, 2003).

Ecological Parameters Altering the Value of Parental Care

According to recent extensions of LHT, the costs and benefits of parental investment should be influenced by two environmental parameters: harshness and unpredictability (Ellis et al., 2009). *Environmental harshness* encompasses all external sources of morbidity and mortality, such as resource scarcity, pathogen load, and exposure to violence and warfare (Chisholm et al., 1993; Gangestad & Simpson, 2000). In Western societies, harshness is often indexed by socioeconomic status, which is strongly and linearly related to most forms of morbidity and mortality (e.g., Chen, Matthews, & Boyce, 2002). *Environmental unpredictability* reflects the degree of variability in local environmental conditions, and it is typically indexed by important changes in the ecology of the family that directly affect parents and/or their children, such as frequent changes in parents' job status, residential changes, and parental transitions (e.g., Belsky, Schlomer, & Ellis, 2012; Simpson et al., 2012). Unpredictable environments put additional strain on individuals because they make it difficult to predict the future and what can or should be done to achieve important goals (Ellis et al., 2009). Because harshness and unpredictability are concep-

tually distinct forms of stress (Ellis et al., 2009), each one may have unique effects on different life-history outcomes.

Environments characterized by greater harshness and unpredictability tend to promote faster life-history strategies characterized by greater mating effort and less parenting effort (Ellis et al., 2009; Kaplan & Lancaster, 2003). In such environments, the probability of dying before reproducing is greater, making it beneficial to mature at an earlier age, become sexually active sooner, and have more children to increase the odds that some will live to adulthood and eventually reproduce (Ellis et al., 2009). Furthermore, the benefits of investing more resources in children in such environments rapidly diminish because one does not know whether additional investments will ever pay off. The rewards of parental investment are only realized over time when the child reaches adulthood and reproduces. Until then, parents are at a resource deficit. Thus, having only as many children as one can support and investing heavily in each of them—which typically characterizes "good" parenting—would have catastrophic results if these children unexpectedly die or become ill and cannot reproduce. Indeed, a great deal of research has linked exposure to harsh and unpredictable environments with faster life history strategies (for a comprehensive review, see Ellis et al., 2009).

Harsh and unpredictable environments should, therefore, tilt the mating–parenting balance more toward mating by, on average, increasing both the potential benefits of mating effort and the potential costs of parenting effort. This is especially true when environmental risks are difficult to predict and avoid, and are therefore relatively insensitive to adaptive decision-making or strategies of the organism (e.g., extrinsic morbidity-mortality; see Stearns, 1992). Because a certain level of risk always exists in such environments, additional parental investment can increase offspring condition and survival only up to a point, beyond which any excess investment becomes inherently risky. Importantly, some types of harsh environments can be buffered by individuals' adaptive behaviors, especially parenting behaviors that improve the chance of offspring survival (Ellis et al., 2009). This is especially true when the sources of risk are constant and can be prepared for, for example in some harsh climates. Nevertheless, given that investment in parenting usually occurs at the expense of investment in mating, any possible benefit of parental investment is essentially weighted against the possible benefit of an equivalent investment in mating. Thus, if investment in mating affords more fitness benefits than investment in parenting in a given environment, enhanced mating effort should occur at the expense of parenting effort.

The Importance of Early-Life Environments

A fairly large body of research has documented the important role of early childhood environments in calibrating life history strategies. Many of these studies have concentrated on the nuclear family environment because such "micro environments" are the context in which most information about the wider world is gathered by young children (Belsky et al., 1991; Simpson, 1999). Several longitudinal studies have confirmed that children who grow up in less supportive family environments (e.g., with absent fathers, harsh parenting practices) or in lower socioeconomic conditions tend to adopt faster life history strategies as indicated by earlier puberty and more unrestricted sociosexuality (e.g., Belsky

et al., 1991; Ellis & Essex, 2007). Unpredictability within early family environments has also been linked to the adoption of fast life history strategies (e.g., Woodward, Fergusson, & Horwood, 2001).

Several recent prospective longitudinal studies have examined the unique effects of separate measures of harshness and unpredictability on life history strategies in adulthood. One analysis conducted on the National Longitudinal Study of Adolescent Health found that frequent changes or ongoing inconsistency in adolescent environments (a measure of unpredictability) and exposure to violence (a measure of harshness) both uniquely predicted traits reflecting a fast life history strategy in young adulthood (Brumbach, Figueredo, & Ellis, 2009). Another longitudinal analysis conducted on the NICHD Study of Early Child Care and Youth Development found that unpredictability (operationalized as the number of residential changes, paternal transitions, and changes in parental employment) and harshness (operationalized as a low income-to-needs ratio) during the first 5 years of life predicted more sexual partners by age 15 (Belsky, Schlomer, & Ellis, 2012). Conceptually similar findings have been documented in a large cohort of British women (Nettle, Coall, & Dickins, 2011), which revealed that lower childhood socioeconomic status (harshness) and more family residential moves during the first 7 years of life (unpredictability) independently predicted earlier age of first pregnancy.

Further evidence comes from the Minnesota Longitudinal Study of Risk and Adaptation. Simpson, Griskevicius, Kuo, Sung, and Collins (2012) tested the effects of harshness and unpredictability experienced during the first five years of life while statistically controlling for harshness and unpredictability experienced later in life (between ages 6 to 16). Exposure to more unpredictable environments early in life (i.e., changes in mother's employment, residence, and cohabitation status) uniquely predicted various indicators of fast life history strategies at age 23, including more sexual partners. Exposure to more harsh environments early in life (lower SES) forecasted earlier sexual debut (age of first sexual intercourse).

Prior research, however, has focused almost exclusively on the mating side of the mating–parenting tradeoff. To our knowledge, no longitudinal study has examined how harshness and unpredictability experienced in early childhood prospectively predict parenting orientations and behavior in adulthood after individuals become parents. Because harshness and/or unpredictability experienced during early childhood are associated with a fast life history strategy in adulthood, we hypothesized that they ought to predict less involved, more emotionally disconnected, and more hostile parenting (i.e., a less positive parenting orientation) as well as lower parental supportive presence (i.e., less supportive parenting behaviors).

Sex-Differentiated Parental Investment

Although the life history strategies of both sexes should be responsive to environmental conditions, there is an asymmetry between women and men in how those strategies are manifested. This is because some of the major selection pressures encountered by males and females during evolutionary history were not identical (Buss & Schmitt, 1993). In particular, the costs and benefits associated with parenting are somewhat different for each sex.

This asymmetry stems from the way in which female mammals reproduce (i.e., internal fertilization and gestation) and the greater initial investments they typically make in early offspring care (i.e., nursing; Trivers, 1972). Males, by comparison, have lower obligatory initial parental investment and experience comparatively less energetic costs associated with having offspring. For this reason, men are more able than women to pursue short-term mating and invest less in parenting, at least initially. Numerous studies have confirmed that men are more inclined to pursue short-term mating opportunities than women (for a meta-analysis, see Oliver & Hyde, 1993).

In addition, while maternal care was virtually a necessity for young children to survive throughout evolutionary history, paternal care may have been more auxiliary, with its incremental value depending on factors within the micro and macro environment (see Geary, 2000; Quinlan, 2007). In ancestral environments, as today, men could have increased the physical (e.g., Hill & Hurtado, 1996), socioeconomic (e.g., Amato, 1998), and emotional (e.g., Florsheim, Tolan, & Gorman-Smith, 1996) well-being of their children by investing more time, effort, and resources in them. However, the incremental value of this investment should have diminished quickly in harsh and unpredictable environments where the quantity of offspring may have been more important than their quality. Conceivably, men might have evolved to adjust to such environments by increasing their mating effort and reproducing with other women, thereby increasing their reproductive success. In contrast, the primary way women could have increased their total fertility was by beginning to have children at a younger age (Ellis, 2004).

In summary, men should be more able than women to benefit reproductively by diverting resources from parenting to mating in harsh and unpredictable environments (Del Giudice, 2009). Men's parenting orientations and behavior, therefore, should be more contingent on the ecological context (Geary, 2000). This suggests that exposure to harshness and/or unpredictability in early life might have a stronger effect on the parenting orientations and behavior of men than women in adulthood. Thus, we hypothesize that:

> *Hypothesis 1 (H1):* Individuals who experience more harshness and/or unpredictability early in life should have a less positive orientation to parenting in adulthood and show decreased parental supportive presence (i.e., less supportive behavior), and these effects should be more pronounced in men.

Mediating Mechanisms: Early Parental Care and Attachment Representations

What might be the mechanisms by which a person's environment in childhood influences their parenting in adulthood? Several studies have documented concurrent negative associations between the level of risk in the current environment and the quality of parental care (e.g., Conger et al., 2002; McLoyd, 1990, 1998; Quinlan, 2007). These negative associations suggest that parents sometimes struggle to provide quality care when stressed by their immediate environment (Belsky & Jaffee, 2006; Crnic & Low, 2002). In addition, Many studies have documented substantial intergenerational continuity in parenting (e.g., Belsky et al., 2005; Kerr, Capaldi, Pears, & Owen, 2009; Shaffer, Burt, Obradovic,

Herbers, & Masten, 2009). Thus, individuals tend to parent their children in a similar way to how they were parented. When considered together, these findings suggest that the quality of parental care received during early childhood might mediate the negative effects of harsh and/or unpredictable early-life environments on parenting in adulthood.

Indeed, several developmental models suggest that harsh and/or unpredictable environments suppress the quality of parental care, which should shunt children toward faster life history strategies (e.g., Belsky et al., 1991; Chisholm et al., 1993; Ellis, 2004). Findings supporting this core assertion come from several prospective longitudinal studies that have examined the rate of sexual development in girls (e.g., Belsky, Schlomer, & Ellis, 2012; Ellis & Essex, 2007; Nettle et al., 2011). These findings indicate that children's developmental systems are responsive to the quality of parental care they receive, and that children treat these parental cues as indicators of future environmental conditions. For most children, the most salient environmental cue within the immediate family environment is the quality and reliability of the care they receive (Belsky et al., 1991; Chisholm et al., 1993; Simpson, 1999). Early parental care experiences organize a child's expectations of her or his environment and direct his or her psychological and behavioral adjustment (Del Giudice, 2009). The quality of parental care, therefore, is likely to be one of the key mechanisms through which early-life environmental conditions shape life history strategies in adults, including parenting orientations and behavior.

In Figure 1a, we present a theoretical model of the proposed mediation of early unpredictability and harshness effects on parenting orientations and behavior. The first link of these mediated paths is the quality of early parental care. Thus, our second hypothesis is:

Hypothesis 2 (H2): Exposure to harsher and/or more unpredictable early environments should be associated with lower quality parental care during this period, which in turn should predict less positive parenting orientations and behavior in adulthood, especially in men.

The process of translating the quality of received parental care early in life into a set of beliefs and expectations about the surrounding world is organized by the child's attachment system (Bowlby, 1969/1982). The attachment system is a species-universal, innate psychobiological system that motivates individuals to seek proximity to supportive others, especially in times of need. When activated by threat, the attachment system launches certain behavioral sequences (e.g., support-seeking) designed to achieve physical or emotional safety with supportive others and alleviate the stress associated with the threat.

The functioning of the attachment system is governed by internal working models that begin to develop early in childhood as a result of interactions with primary caregivers. Caregivers who provide sensitive and reliable comfort in times of need typically instill positive working models of self and others, which promote the development of secure attachment representations (i.e., secure working models). Secure attachment, in turn, promotes a positive view of the world as safe and predictable, which typically leads to the adoption of a slower life history strategy that tends to be adaptive in such environments (Belsky et al., 1991; Del Giudice, 2009; Simpson & Belsky, 2008). Insensitive and unreliable caregiving, on the other hand, generates negative working models of self and others, usually resulting in insecure attachment representations. Consequently, insecure attachment representations promote a view of the world as unsafe and unpredictable, which typically results in the enactment of a faster life history strategy that tends to be more adaptive in less trustworthy environments (Belsky et al., 1991; Del Giudice, 2009; Simpson & Belsky, 2008).

Consistent with this premise, self-reported attachment insecurity is linked with indicators of fast life history strategies such as earlier age of first birth (Chisholm, Quinlivan, Petersen, & Coall, 2005) and short-term mating orientations (Schachner & Shaver, 2004). Beyond its broad association with life history strategies, however, secure attachment has been theorized to be particularly important for effective, high-quality parenting (Bowlby, 1969/1982). Indeed, parents who have more secure states of mind, as assessed by the adult attachment interview (AAI; George, Kaplan,
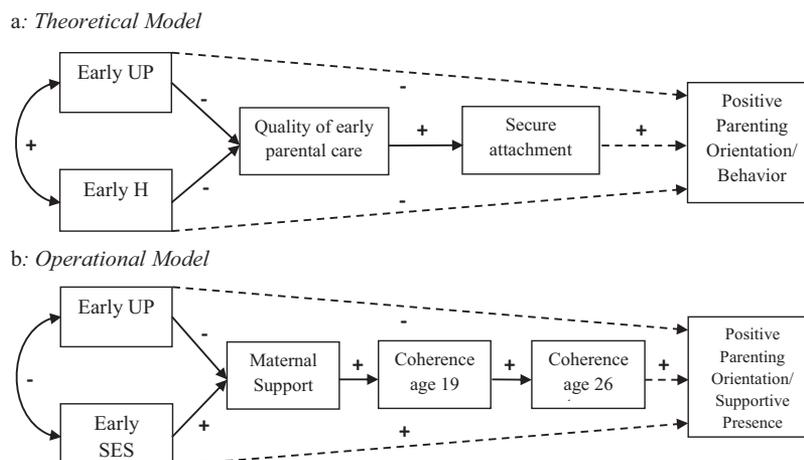

Figure 1. Hypothesized theoretical (a) and operational (b) meditation models of the effects of early-life unpredictability (UP) and harshness (H) on parenting orientations/behavior. Dashed paths are expected to vary between the genders.

& Main, 1985), typically provide their children with more supportive and sensitive caregiving (e.g., Adam, Gunnar, & Tanaka, 2004; Phelps, Belsky, & Crnic, 1998; for a meta-analysis, see Van IJzendoorn, 1995). Similar associations have been found using self-report measures of attachment (see Jones, Cassidy, & Shaver, 2015).

Thus, as shown in Figure 1a, a causal path from exposure to harsher and/or more unpredictable childhood environments to less positive parenting orientations and behavior in adulthood should be mediated by early-life experiences of receiving less supportive caregiving. These experiences, in turn, should produce insecure attachment representations that lead to less positive adult parenting orientations and behavior, which may partly explain their intergenerational transmission (George & Solomon, 2008). Our third hypothesis, therefore, is:

> *Hypothesis 3 (H3):* Receiving lower quality early-life parental care should predict less secure attachment representations in adulthood, which in turn should predict less positive adult parenting orientations and behavior, especially in men.

The Current Research

The purpose of the current research was to test our life history model of individual differences in parenting (Figure 1a). Using prospective (Studies 1a and 1b) and retrospective (Study 2) measures, we examined whether individuals, especially men, who experienced greater unpredictability and/or harshness in their early childhood had less positive parenting orientations (Studies 1a and 2) and displayed less parental supportive presence in behavioral observations with their own children (Study 1b). In addition, we examined whether these effects were mediated by early supportive parenting and adult attachment representations (Studies 1a and 1b), and by self-reported adult attachment anxiety and avoidance (Study 2).

In Studies 1a and 1b, we conducted analyses on all the participants who had children by age 32 (Study 1a) or participated in behavioral observations with their children (Study 1b) in the Minnesota Longitudinal Study of Risk and Adaptation (MLSRA; Sroufe et al., 2005). The MLSRA has followed approximately 170 individuals and their birth mothers from before these individuals were born all the way into middle adulthood. These individuals (the second generation participants) were born to first-time mothers recruited at free public health clinics in Minneapolis, Minnesota, between 1975 and 1977. At recruitment, all of the mothers were living below the poverty line, so participants in the sample (the first-born children of these mothers) were exposed to a variety of different stressors during their early years. The MLSRA has very good prospective observer-rated assessments of early-life stress, quality of maternal support, adult attachment representations, and adult parenting orientations and behavior expressed toward the third generation (i.e., the participants' own children).

In Study 1a, we used an interview-based measure of positive parenting orientation. Our sample included all MLSRA participants who were parents and who completed a semistructured parenting interview at age 32. These interviews were rated by trained coders for various aspects of parenting. In Study 1b, we used a behavioral measure of parental supportive presence. Our sample included MLSRA participants who were observed in the

lab interacting with their first-born child at 24 and 42 months of age. During these videotaped lab sessions, participants' children completed various problem-solving and teaching tasks that required the assistance of the parent. Trained coders rated the level of supportive presence provided by the parents during these tasks. Both Study 1a and Study 1b used prospective measures of early-life unpredictability, early-life harshness, early maternal supportive presence, and adult attachment representations, all of which were available in the MLSRA dataset.

In Study 2, we collected retrospective measures of early-life unpredictability and early-life harshness from an online sample of parents. Positive parenting orientation was assessed with a self-report questionnaire, as were adult attachment anxiety and avoidance orientations. The purpose of Study 2 was to test and hopefully replicate the effects of early-life unpredictability and/or harshness on a larger, more heterogeneous sample in terms of socioeconomic status and to explore unique mediation paths through attachment anxiety and/or attachment avoidance.

Study 1a: Parenting Orientation

In Study 1a, we conducted two analyses on all the MLSRA participants who were parents by age 32. To test our main hypothesis, we examined whether early-life exposure to unpredictability (coder-rated measures collected between ages 0 and 4) and harshness (SES between ages 3.5 and 4.5) predicted parenting orientations (positive vs. negative) at age 32, assessed by a parenting interview. To test the hypothesized mediation effects (see Figure 1a), we examined whether coder-rated measures of early maternal supportive presence (between ages 0–4 years) and adult attachment representations (at ages 19 and 26 years) assessed by the Adult Attachment Interview (AAI; George et al., 1985) mediated the connection between early-life environments and adult parenting orientations. Gender moderation was also tested in both sets of analyses.[1]

Our operational (construct-specific) mediation model is displayed in Figure 1b. Specifically, we expected that men (and to a lesser extent women) who grew up in low SES (harsher) conditions and/or experienced more unpredictability within their family environment early in life would have a less positive orientation toward parenting at age 32. We also expected that these effects would be serially mediated by lower early maternal supportive presence and more insecure attachment representations at ages 19 and 26 years.

Method

Participants. Our sample included second-generation (G2) participants in the MLSRA, all of whom were parents when they completed a parenting interview at age 32 (see below) and on

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[1] Two components of this model have been investigated on the MLSRA sample. Specifically, measures of age 32 parenting and behavioral parenting assessments (Study 1b) were shown to be associated with AAI coherence scores (Shlafer, Raby, Lawler, Hesemeyer, & Roisman, 2015). Age 32 parenting measures were also shown to be associated with maternal sensitivity—a composite including assessments of maternal supportive presence (Raby et al., 2015). However, these studies did not use our parenting orientation measure, and they did not examine gender-specific paths.

whom we had early-life harshness and unpredictability data (N = 112; 46% male). Participants varied in race (61.6% European American, 15.2% African American, 17.9% mixed race, 5.3% other races) and educational attainment (5.4% no degree, 33.4% GED or high school diploma, 50% post high school education, 11.6% 4-year degree or higher). They were parenting between one and 11 biological and nonbiological children (M = 2.56, SD = 1.59) who ranged in age from 2 months to 21-years-old at the time. The age at which participants had their first biological child ranged from 15- to 32-years-old (M = 23.32, SD = 4.28).

Measures. The data used in the study were collected and coded prospectively as part of the MLSRA.

Early-life unpredictability. Consistent with previous research (e.g., Belsky, Schlomer, & Ellis, 2012; Simpson et al., 2012), our early-life unpredictability measure consisted of three items from the Life Events Schedule (LES; Egeland, Breitenbucher, & Rosenberg, 1980), which was adapted from Cochrane and Robertson's (1973) Life Events Inventory. These items assessed mothers' life stress during the preceding year stemming from three sources: (a) changes in employment status (e.g., periods of unemployment); (b) changes in residence (e.g., moving to a different house or apartment); and (c) changes in cohabitation status (e.g., whether and how often romantic partners moved in or out of the house/apartment). Mothers' interview responses to each item were rated by trained coders for the intensity of disruption associated with each event on a scale ranging from 0 (*no disruption*) to 3 (*severe disruption*). The coding was based on a coding manual developed by MLSRA staff designed to maintain unified and precise coding standards. For example, for changes in cohabitation status, moving in or out by mutual agreement was scored as low disruption, whereas undesired moving out (e.g., a boyfriend leaving due to major conflicts or going to jail) was scored as high disruption. Interrater reliabilities for each rated item were above .90.

Because we were interested in unpredictability experienced early in life, we created an accumulated early-life unpredictability measure composed of items administered during the first 4 years of each child's life (at 12 months, 18 months, and 48 months).[2] Consistent with prior research (e.g., Simpson et al., 2012), we summed the three items across the three assessment periods to create a measure of accumulated unpredictability experienced during this time period. This measure is very similar to other measures of early-life unpredictability that have been used in prior studies with different samples (e.g., Belsky, Schlomer, & Ellis, 2012). Because the measure was positively skewed and we wanted to avoid capitalizing on a small number of very high-scoring participants, we applied a square root transformation to this measure. All of the results were virtually identical, regardless of whether this transformation was or was not used.

Early-life harshness. Consistent with prior research (e.g., Belsky, Schlomer, & Ellis, 2012; Nettle et al., 2011; Simpson et al., 2012), we assessed early-life harshness using SES. Two measures of SES were available within our targeted timeframe (at 42 and 54 months). The 42-month measure was based on mothers' educational attainment and the revised version of the Duncan Socioeconomic Index (SEI; Duncan, 1961; Stevens & Featherman, 1981). The 54-month measure was based on mothers' SEI alone. A composite early-SES measure was then created by computing SES-based z scores of the available items within each of the two

assessment periods. These values were then transformed to t scores (M = 50, SD = 10) to remove negative values, which generated positively scaled scores. As expected, the 42-month and 54-month scores were positively correlated, r = .41, p < .001, so they were averaged to create a composite early-SES score (up to age 4.5). In the current sample, these standardized SES scores ranged from 37.83 to 95.93 (SD = 8.33). Because this measure was positively skewed and we wanted to avoid capitalizing on a small number of high-scoring participants, we applied a square root transformation. All of the results were virtually the same, regardless of whether this transformation was or was not used.

Early maternal supportive presence. In the MLSRA sample, nearly all of the mothers were the primary (and oftentimes single) caregivers of G2 participants. In addition, mothers were recruited to participate in the study, not fathers (Sroufe et al., 2005). Thus, even in cases where fathers were present, they typically did not take part in the study. Early parenting assessments, therefore, focused on just the mothers.

The MLSRA has two assessments of maternal supportive presence during each child's first 4 years of life. When children were 24- and 42-months-old, they and their mothers were observed in the lab while completing problem-solving and teaching tasks. The tasks gradually increased in complexity from start to finish, eventually becoming too difficult for the children to solve on their own. The mothers were instructed to first allow their child to attempt the task independently and then step in and provide help if/when they thought it was appropriate to do so. The videotaped sessions were rated by trained coders for mothers' supportive presence on a 7-point scale (ICCs = .84 and .87 for 24 and 42 months assessments, respectively). High scores were given to mothers who showed interest and were attentive to the needs of their child, who responded contingently to their child's emotional signals, and who reinforced their child's success. Low scores were given to mothers who were distant, hostile, and/or unsupportive. As expected, 24- and 42-month scores were positively correlated, r = .43, p < .001, so they were averaged to create a composite early maternal supportive presence score.

Adult attachment representations. G2 participants were administered the adult attachment interview (AAI; George et al., 1985) at ages 19 and 26 years. This well-validated, semistructured interview assesses the degree to which adults have a coherent narrative about their early childhood experiences, primarily between the ages of 5–12. Participants were asked to describe their early relationships with their caregivers and to reflect on episodes of separation, rejection, abuse, and loss. Following Main and Goldwyn's (1998) coding system, the transcribed AAI narratives were then rated on a set of 9-point scales that assessed attachment-related states of mind and inferred experiences. Unlike self-

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[2] Simpson et al. (2012) had two additional time-points in their measure taken at 54 and 64 months. To maintain a timeframe that was parallel to our maternal supportive presence assessments at 24 and 42 months, we did not include these later assessments in our measure of early unpredictability. We did, however, conduct an additional test of our unmediated model with an early unpredictability measure that included these later two assessments (i.e., with a measure identical to the one used by Simpson et al., 2012). The results were essentially the same as those reported in this paper in that all significant effects remained significant and all nonsignificant effects remained nonsignificant.

reported measures of attachment, which focus on conscious appraisals and attributions that individuals make about themselves and their romantic partners/relationships, the scoring of the AAI focuses on the degree to which individuals are able to discuss past relationship experiences with their parents in an integrated and believable manner, regardless of whether they view these past experiences negatively or positively. (For more on differences between the AAI and self-reported measures of attachment, see Mikulincer & Shaver, 2007; Roisman et al., 2007; Shaver, Belsky, & Brennan, 2000.)

In our analyses, we used the *coherence of mind* scale, which assesses each individual's ability to freely explore his or her feelings about different childhood experiences in an organized/emotionally well-regulated versus a nonorganized/emotionally dysregulated manner. This scale is commonly used as a dimensional measure indexing the degree of attachment security, and it is associated with early experiences with parents (e.g., Raby, Cicchetti, Carlson, Egeland, & Collins, 2013; Roisman, Madsen, Hennighausen, Sroufe, & Collins, 2001). Attachment security is inferred from coherence and cooperation during the interview along with believable memories of specific instances of care or support provided by parents. Indeed, Fyffe and Waters (1997) showed that coder-rated coherence correlates almost perfectly with a linear combination of AAI coding scales that reliably distinguish between the secure and insecure categories of the AAI, indicating that coders' categorical secure/insecure judgments are almost perfectly related to their coherence ratings. In the current sample, interrater reliabilities for the coherence of mind scale were .77 and .85 for age-19 and age-26 assessments, respectively.

Positive orientation to parenting. At age 32, G2 participants completed a semistructured, hour-long interview that assessed their general orientation to parenting. The interview had three parts. First, participants provided their thoughts about the ideal parent–child relationship and the role of parents in children's lives. Second, they gave examples of their own parenting practices that supported their own parenting theories, and they were asked about their long-term hopes and concerns regarding their children. Finally, participants discussed their experiences of providing support, affection, and discipline to their children.

These audio-recorded interviews were then rated by trained coders on several parenting dimensions using 7-point rating scales (for a full description of these scales, see Raby, Lawler, Shlafer, Hesemeyer, Collins, & Sroufe, 2015). The ratings focused on each parent's expressed beliefs and attitudes toward parenting, their parenting behaviors, and the congruence between the two. We were specifically interested in participants' general orientation toward parenting.[3] Three scales reflected positive versus negative orientations: *positive emotional connectedness* (i.e., the amount of warmth expressed toward children and the pleasure of being a parent), *parental investment/involvement* (i.e., the amount of importance placed on being a parent and being committed to parenting), and *hostile parenting* (i.e., the amount of derogation or rejection of children, which was reverse-keyed). Interrater reliabilities were good for all three scales (all ICCs > .80).

Principal components analysis indicated that the three scales loaded on a single factor that explained 66.7% of their variance. The internal consistency was also adequate ($\alpha = .74$). Hence, the three scales were averaged to create a composite measure of parenting orientation. Higher scores indicated a more positive orientation to parenting.

Current unpredictability and harshness. In order to control for the shared environment between early childhood and adulthood, we included in our analyses analogous measures of current unpredictability and harshness. These measures were collected in the same assessment as the parenting interview, at age 32. Current unpredictability was assessed by three items from the LES (Egeland et al., 1980). As with early-life unpredictability, these items inquired about changes in employment status, changes in residence, and changes in cohabitation status during the past year. A current unpredictability measure was then computed from these items in an identical way to the early-life unpredictability measure ($M = 1.37$, $SD = 1.65$). Current harshness was assessed using highest household SES (SEI; Duncan, 1961; Stevens & Featherman, 1981), similar to early-life harshness ($M = 38.48$, $SD = 14.58$).

Paternal presence and support. As noted previously, the MLSRA focused on maternal caregiving rather than paternal caregiving. The mothers were the ones originally recruited for the study, and they almost always were the primary caregivers. Nevertheless, some data about the fathers' presence in the house and the level of emotional support they gave to their children could be extracted from repeated extensive interviews with mothers, teachers, and G2 participants rated by coders (Pierce, 1999). The resulting scales were validated by correlating them with reports from 44 fathers who agreed to be interviewed about their relationship with their children (average $r = .41$; Pierce, 1999). In the current study, we used a dichotomous scale for biological father presence/absence during early childhood (when children were 24- to 64-months-old; 67.9% rate of father absence), and a 4-point scale of paternal emotional support during early childhood, which could range from 1 (*no male in the home*) to 4 (*high quality*). Due to the early developmental period, these scales relied heavily on mother reports. The scales were used in supplemental analyses to rule out alternative explanations for our findings.

Missing Data

Although all participants had complete data for harshness and unpredictability during childhood and their parenting orientation at age 32, some of the other variables had missing values. Specifically, 3.7% of the values in the study were missing and 16.1% of the participants had at least one missing value (although only 2.7% had two missing values and none had more than two). Preliminary analysis of the missing data did not reveal any nonrandom patterns. Thus, we used Full Information Maximum Likelihood (FIML) to fit our models (Enders, 2010).

Results and Discussion

Descriptive statistics and zero-order correlations for all major variables are presented in Table 1, separately for men and women. Bonferroni-corrected contrasts did not reveal any statistically sig-

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[3] Scales that assessed participants' confidence, coherence of parenting philosophy, and boundary dissolution were not included in our parenting orientation measure because they do not reflect a clearly positive or negative orientation to parenting.

Table 1

Means, Standard Deviations, and Zero-Order Correlations Between Study Variables for Men and Women (Study 1a)

	1	2	3	4	5	6
1. Early-life unpredictability		−.03	−.05	−.18	.01	.08
2. Early-life SES	−.12		.09	.08	.31*	.14
3. Maternal supportive presence	−.36*	.13		.32*	.31*	.13
4. AAI coherence (age 19)	−.17	−.20	.14		.38**	−.03
5. AAI coherence (age 26)	−.18	−.09	−.09	.42**		.08
6. Positive parenting	−.36*	.11	.39**	.03	.32*	
Mean (Men)	3.92	50.26	4.26	3.55	4.23	5.38
SD (Men)	2.56	9.75	1.32	1.63	1.82	1.20
Mean (Women)	5.19	49.15	4.30	3.98	4.36	5.40
SD (Women)	2.99	6.88	1.38	1.63	1.84	1.06

Note. Correlations above the diagonal are for women; those below the diagonal are for men.
$^*p < .05.$ $^{**}p < .01.$

nificant gender differences for the means or variances for any of the variables.

The main analyses were conducted in two stages. First, we fitted an unmediated model in which early-life harshness (up to age 4.5) and early-life unpredictability (up to age 4) predicted parenting orientation at age 32 (see Figure 2a).[4] Second, informed by the results of the first analysis, we then fitted a mediation model in which the effect of early unpredictability on parenting orientation was serially mediated by G1 mother's supportive presence, G2 age-19 AAI coherence of mind scores, and G2 age-26 AAI coherence of mind scores (see Figure 4). These models were fitted using multigroup path analysis, wherein regression paths that were expected to vary between women and men were freely estimated separately for the genders (for a similar application of multigroup path analysis, see Belsky, Schlomer, & Ellis, 2012). Invariance tests were conducted to ascertain the statistical significance of gender moderation. These tests are analogous to gender interaction tests (Kline, 2010). All analyses were conducted using AMOS version 19. In all analyses, we also controlled for current (age 32) unpredictability, current harshness, age 32 educational attainment, age 32 relationship status (in a relationship vs. not in a relationship), and number of children at age 32.

Unmediated model: The effects of early-life unpredictability and harshness on parenting orientation. We examined the unmediated model first to obtain a clean test of our first hypothesis—that men who experienced more harshness and/or unpredictability early in life would have a more negative orientation to parenting in adulthood. Gender did not moderate the effect of either early-life SES (harshness) on parenting orientation or the correlation between early-life unpredictability and early-life SES. Hence, these parameters were constrained to be equal across the genders (i.e., they were estimated for the full sample) with only a negligible reduction in model fit ($\Delta\chi^2_{(2)} = 2.09$, *ns*). Early-life SES did not have a significant effect on age-32 parenting orientation (see Figure 2a).

In contrast, the path from early-life unpredictability to age 32 parenting orientation did vary between the genders, supporting our first hypothesis (see Figure 2a). Although early-life unpredictability did not predict parenting orientation in women at age 32, a significant negative effect emerged for men, indicating that men who experienced more unpredictability during the first

four years of life had a less positive orientation to parenting. When a gender-equality constraint was imposed on this path, model fit decreased significantly ($\Delta\chi^2_{(1)} = 4.25$, $p = .039$), indicating a significant Gender × Unpredictability interaction.[5] This interaction effect also emerged using a more traditional interaction test in multiple regression (see Figure 3a). The model explained 10.6% of the variance in men's parenting orientation, but only 0.9% of the variance in women's parenting orientation, above and beyond the effects of the control variables.

One possible alternative explanation for why an early-life unpredictability effect was found only for men is that our unpredictability measure might have been confounded with father absence. Indeed, one of the items that contributed to our measure of unpredictability was *changes in cohabitation status* (i.e., boyfriends moving in and out of the house). Thus, it could be that men's parenting orientations are actually sensitive to the absence of a paternal role model. Women's parenting orientations, on the other hand, might be more sensitive to the absence of a maternal role model and, for this reason, were not affected by early-life unpredictability as measured in this study.

To rule out this alternative explanation, we performed two additional analyses. First, we repeated the analysis described above with a reduced unpredictability measure that did not contain the cohabitation changes item. The results remained virtually identical, with early-life unpredictability still having a significant effect on men's parenting orientations ($\beta = -.30$, $p = .028$), but not on women's ($\beta = .07$, *ns*). Moreover, the interaction remained statistically significant ($\Delta\chi^2_{(1)} = 3.93$, $p = .048$). Second, we repeated the analysis while controlling for early father absence (yes vs. no). Once again, the results were virtually identical. Early-life unpredictability still had a significant effect on men's parenting orien-

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[4] In the interest of brevity, we did not include the effects of control variables in any of the figures. A list of covariates for each figure is provided in each figure caption. Full path analyses results, including the effects of control variables, are available from the first author upon request.

[5] This Gender × Unpredictability effect also emerged when gender equality constraints on the SES-to-parenting orientation path and the unpredictability-SES correlation were removed ($\Delta\chi^2_{(1)} = 4.54$, $p = .033$). It also remained significant when SES and all other covariates were excluded from the model ($\Delta\chi^2_{(1)} = 5.18$, $p = .023$).

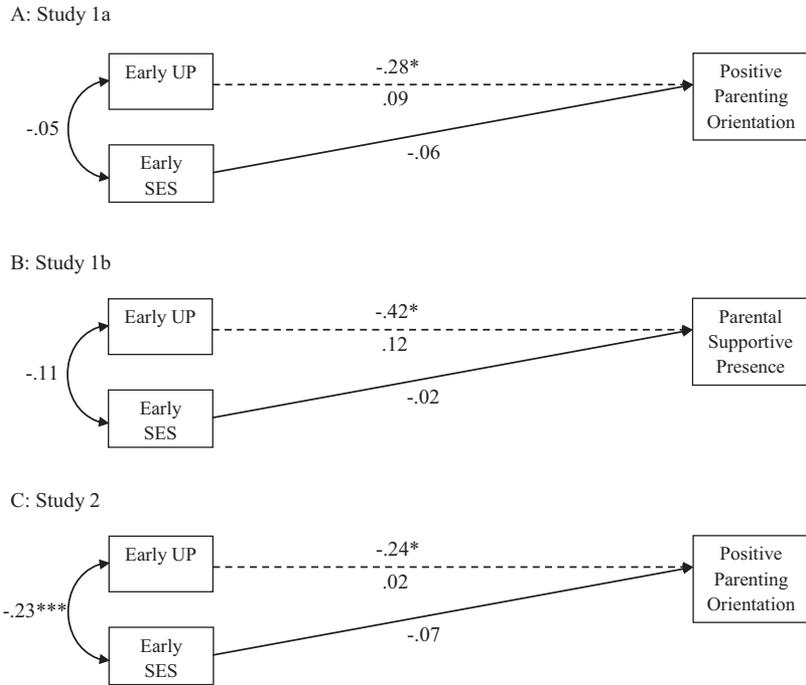A: Study 1a

B: Study 1b

C: Study 2

Figure 2. Multigroup analyses for all studies. In each chart, the dashed path from early-life unpredictability (UP) to parenting orientation was allowed to vary between the genders. For this path, the upper coefficient is for men; the lower coefficient is for women. All coefficients are standardized. Study 1a controls: Current unpredictability, current SES, educational attainment, relationship status, and number of children; Study 1b control: Age of parent; Study 2 controls: Age of parent, current unpredictability, current SES, educational attainment, relationship status, and number of children. * $p < .05$. *** $p < .001$.

tations ($\beta = -.32$, $p = .022$), but not on women's ($\beta = .10$, *ns*), and the interaction was still statistically significant ($\Delta\chi^2_{(1)} = 4.20$, $p = .040$). Moreover, father absence did not have significant effects on men's or women's parenting orientations ($\beta = -.04$ and $\beta = .02$, respectively). In sum, the results of these additional analyses indicate that early-life unpredictability effects on parenting are not subsumed by father absence.

Serial mediation model: The role of maternal supportive presence and attachment representations. Next, the serial mediation model was fitted to test our second and third hypotheses. In

the absence of a significant total effect for early-life SES (harshness), these mediation hypotheses were tested only for early-life unpredictability. We expected that greater unpredictability early in life would be associated with less supportive maternal behavior during that time period, which would result in more insecure attachment representations in adulthood on the AAI. This, in turn, should lead to a less positive parenting orientation in men. Two possible mediated paths were included in the model: (a) a single mediation path from early-life unpredictability to parenting orientation through early maternal supportive presence; and (b) a serial
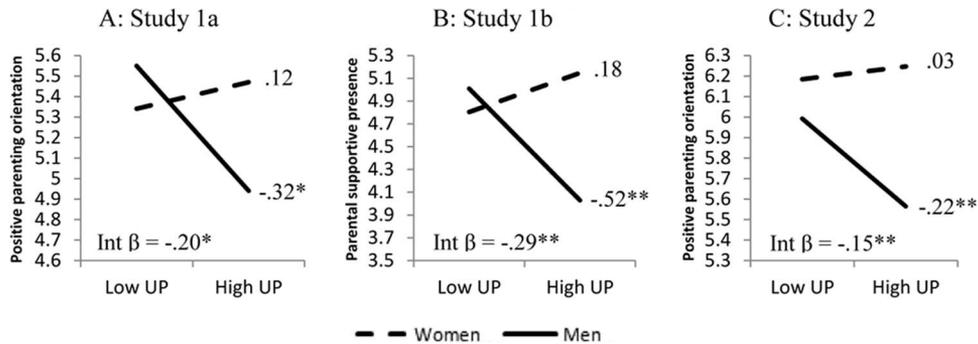

Figure 3. Unpredictability × Gender interactions and unpredictability (UP) simple slopes in all studies (multiple regression results). Low UP = −1 *SD*; High UP = +1 *SD*. Study 1a controls: Current unpredictability, current SES, educational attainment, relationship status, and number of children; Study 1b control: Age of parent; Study 2 controls: Age of parent, current unpredictability, current SES, educational attainment, relationship status, and number of children. * $p < .05$. ** $p < .01$.
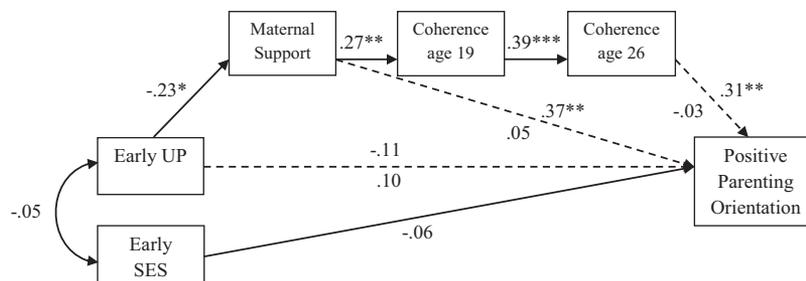
Figure 4. Multigroup mediation analysis of Study 1a. Dashed paths were allowed to vary between the genders. For these paths, the upper coefficient is for men, and the lower coefficient is for women. Age 32 controls: Unpredictability, SES, educational attainment, relationship status, and number of children. $^* p < .05.$ $^{**} p < .01.$ $^{***} p < .001.$

mediation path from early-life unpredictability to parenting orientation through early maternal supportive presence, AAI coherence of mind at age 19, and AAI coherence of mind at age 26 (see Figure 4).

The paths not expected to vary between the genders were constrained to be equal for men and women. All paths leading to parenting orientation, however, were allowed to vary between the genders. These included the direct path from early-life unpredictability to parenting orientation, the direct path from early maternal supportive presence to parenting orientation, and the path from AAI coherence of mind at age 26 to parenting orientation. This model ($\chi^2_{(49)} = 60.14$, $p = .132$; RMSEA = .045) fit the data significantly better than a fully constrained (unmoderated) model ($\Delta\chi^2_{(3)} = 10.48$, $p = .015$).

Consistent with the second hypothesis, mothers who raised their children (the participants) in more unpredictable early-life environments displayed less supportive presence toward their children. Moreover, consistent with the third hypothesis, these children were less likely to have coherent AAI attachment representations later at ages 19 and 26, meaning that they were more insecurely attached in adulthood. For male children only, however, significant paths were found from early maternal supportive presence and AAI coherence of mind at age 26 to parenting orientation at age 32 (see Figure 4). The resulting indirect paths from early-life unpredictability to parenting orientation explained 44.4% of the total effect of early unpredictability on parenting orientation in men (indirect $\beta = -.09$), and reduced the direct effect in men to nonsignificance ($p = .31$). Approximately 8% of this indirect effect went through AAI coherence of mind at ages 19 and 26, and the rest went through early maternal supportive presence directly to parenting orientation at age 32. The indirect effect in women was close to zero ($\beta = -.01$). The mediation model explained 31.9% of the variance in men's parenting orientation, but only 1.8% of the variance in women's parenting orientation, above and beyond the effects of the control variables.

Because of missing data, bootstrapped confidence intervals for indirect effects could not be computed. Thus, we adopted a Bayesian estimation approach (Bolstad, 2004). Under this approach, confidence intervals are calculated based on the posterior distribution of a given parameter (e.g., an indirect effect), which is obtained through computerized simulation (Markov Chain Monte Carlo—MCMC; Gamerman & Lopes, 2006). These confidence intervals are interpreted in the usual fashion.

Consistent with the second hypothesis, the Bayesian 95% CI for the indirect effect of early-life unpredictability on parenting orientation did not include 0 for men (95% CI [−.003, −.21]), indicating a statistically significant effect. The same indirect effect for women was not significant (95% CI [−.08, .05]). We also tested the specific indirect effect from early maternal supportive presence to parenting orientation through AAI coherence at ages 19 and 26. Consistent with the third hypothesis, this indirect effect was significant for men (95% CI [.001, .085]), but not for women (95% CI [−.04, .03]).

Alternative models. In addition to testing our hypothesized models, we also examined four alternative models. First, we examined whether early maternal supportive presence moderated the relation between early-life unpredictability and parenting orientation. To do so, we ran our unmediated model again (see Figure 2a) with the addition of early maternal supportive presence and the interaction between early maternal supportive presence and early-life unpredictability. This interaction was nonsignificant for both men ($\beta = .04$) and women ($\beta = .03$).

Second, we examined whether early-life harshness effects or early-life unpredictability effects for women emerged in the presence of current harshness or unpredictability. For this purpose, we ran the unmediated model again with the addition of all two-way interactions between early-life SES and unpredictability and age-32 SES and unpredictability. These interactions did not reveal any conditional early-life SES or unpredictability effects.

Third, because early maternal supportive presence and early-life unpredictability were assessed during the same time period, we tested an alternative mediation model in which early maternal supportive presence predicted early-life unpredictability rather than the reverse. Thus, we ran the mediation model again (see Figure 4) while switching the roles of these two variables. Unlike our original model, this model did not yield a significant mediated path for men ($\beta = .02$; 95% CI [−.02, .09]), mainly because early-life unpredictability did not predict men's parenting orientation above and beyond early maternal supportive presence ($\beta = -.11$, *ns*).

Fourth, we tested for a unique mediation path from early-life unpredictability to adult parenting orientation through early paternal emotional support (reported by the mothers). To accomplish this, we ran our mediation model again with the addition of early paternal emotional support as a parallel mediator to early maternal supportive presence. Early paternal emotional support was not related to early-life unpredictability, and it did not predict either

coherence of mind at age 19 or parenting orientation at age 32. Moreover, it did not impact the other effects in the model (i.e., their significance status remained the same). The results of this additional analysis are provided as supplemental material (see Supplemental Figure S1).

Summary and discussion.   The results of Study 1a support our three hypotheses for early-life unpredictability. Experiencing a more unpredictable environment in early life was associated with having a more negative parenting orientation at age 32 in men. This effect was mediated by early maternal supportive presence and also partially mediated by AAI coherence of mind at ages 19 and 26. Because we controlled for current (age 32) unpredictability and harshness and other possible correlates of parenting orientation, these results indicate that early exposure to unpredictable environments has an enduring effect on men's parenting orientation. The mediation results suggest that this effect may be attributed to: (a) primary caregivers (in our case, mothers) providing less supportive parenting in unpredictable environments; and (b) children growing up to be insecurely attached due in part to these conditions.

One limitation of Study 1a is that it examined interview-based assessments of parenting orientation rather than observations of actual parenting behavior. It seems likely that parenting orientations should, to some extent, reflect the operation of psychological mechanisms that also influence actual parenting behavior, just as mating preferences to some extent reflect the operation of psychological mechanisms that affect actual mating behavior (Buss & Schmitt, 1993). It is unlikely, however, that parenting orientations correspond perfectly with actual parenting behavior. Whereas the former reflect individuals' basic attitudes toward their children and their own role as parents, the latter reflect how individuals actually behave toward their children (e.g., the degree to which they support their children in times of need). Moreover, although they were coded by raters, parenting orientations were reported by each parent. It is possible, for example, that the mothers in our sample felt socially obligated to present themselves as good parents no matter what, which could explain the lack of effects for women's parenting orientations. Although this explanation is somewhat undercut by the similar means of men's and women's parenting orientations (see Table 1), it is important to determine whether a similar pattern of results emerges when parenting behavior is examined. This was the primary goal of Study 1b.

Study 1b: Parenting Behavior

Our goal in Study 1b was to test our operational model (see Figure 1b) using a behavioral parenting measure. For this purpose, we conducted additional analyses on the MLSRA sample using a behavioral observational measure of parental supportive presence based on lab observations of G2 participants interacting with their own children. The analyses were similar to the ones conducted in Study 1a, using the same independent variables and mediators. The MLSRA sample used for these analyses was slightly different than the sample used in Study 1a, although there was significant overlap (see below).

Similar to Study 1a, we expected that men (and to a lesser extent women) who experienced more unpredictability within their family environment early in life would be rated by independent observers as less supportive of their own children. We also expected

that this effect would be serially mediated by lower early maternal supportive presence and more insecure attachment representations at ages 19 and 26. Given the results of Study 1a, we did not expect any early-life harshness effects on G2 parental supportive presence.

Method

Participants.   Our sample consisted of 96 G2 participants (38% male) in the MLSRA who participated in at least one of two parenting observations when their firstborn child was 24- and 42-months-old (see below) and on whom we had early-life harshness and unpredictability data. Most participants (66.7%) took part in both parenting observations. Participants' ages at the time of assessment (averaged between both assessments) ranged from 21 to 37 years ($M = 27.38$, $SD = 3.96$). Eighty-six of the participants were also in the Study 1a sample. There were no significant differences between these 86 participants and the 26 participants who were included only in Study 1a or the 10 participants who were included only in Study 1b on any of the major variables.

Measures.   The data used in Study 1b were collected and coded prospectively as part of the MLSRA. The independent and mediator variables were the same as in Study 1a. Because participants were observed at various ages and not as part of a particular data collection wave, we did not have measures of their current environment.

Behavioral observation of parental supportive presence. The behavioral measure used in this study was identical to the measure of early maternal supportive presence used in Study 1a. Namely, G2 participants came to the lab with their firstborn child when their child was 24- and 42-months-old and performed the same tasks as they (participants) did with their own mothers when they were 24- and 42-months-old. Specifically, G2 participants and their children were observed in the lab while each child completed problem-solving and teaching tasks. The tasks gradually increased in complexity from start to finish, eventually becoming too difficult for the children to solve on their own. The parents were instructed to first allow their child to attempt the task independently and then step in and provide help if and when they thought it was appropriate to do so.

The videotaped sessions were then rated by trained coders for parents' supportive presence on a 7-point scale (ICCs = .79 and .86 for 24- and 42-months assessments, respectively). High scores were given to parents who showed interest and were attentive to the needs of their child, who responded contingently to their child's emotional signals, and who reinforced their child's success. Low scores were given to parents who were distant, hostile, and/or unsupportive. As expected, 24- and 42-month scores were positively correlated, $r = .56$, $p < .001$, so they were averaged to create a composite parental supportive presence score. The correlation of this behavioral parenting measure with the interview-based parenting orientation measure examined in Study 1a was moderate in size, $r = .32$, $p = .003$, indicating that these two measures capture somewhat distinct aspects of parenting.

Missing Data

All participants had complete data for harshness and unpredictability during childhood and a parental supportive presence score.

As with Study 1a, however, some of the other variables had missing values. Specifically, 2.8% of the values in Study 1b were missing, and 14.6% of the participants had at least one missing value (although only one participant had two or more missing values). Preliminary analysis of the missing data did not reveal any nonrandom patterns. Thus, we used Full Information Maximum Likelihood (FIML) to fit our models.

Results and Discussion

Descriptive statistics and zero-order correlations for the study variables are presented in Table 2, separately for men and women. Bonferroni-corrected contrasts did not reveal any statistically significant gender differences for the means or variances for any of the variables.

We conducted the same analyses described in Study 1a with the behavioral parental supportive presence measure replacing the interview-based parenting orientation measure as the dependent variable. First, we fitted an unmediated model in which early-life harshness (up to age 4.5) and early-life unpredictability (up to age 4) predicted parental supportive presence (see Figure 2b). Second, we fitted a mediation model in which the effect of early unpredictability on parental supportive presence was serially mediated by G1 mother's supportive presence, G2 age-19 AAI coherence of mind, and G2 age-26 AAI coherence of mind (see Figure 5). Similar to Study 1a, these models were fitted using multigroup path analysis. All analyses were conducted using AMOS version 19. In all analyses, we controlled for the age of the G2 participant (i.e., the parent) at the time of the assessment.

Unmediated model: The effects of early-life unpredictability and harshness on parental supportive presence. The unmediated model tested the first hypothesis: that men who experienced more harshness and/or unpredictability early in life would provide their children with less supportive presence. As in Study 1a, gender did not moderate either the effect of early-life SES (harshness) on parental supportive presence or the correlation between early-life unpredictability and early-life SES. Hence, these parameters were constrained to be equal across the genders, producing a negligible reduction in model fit ($\Delta\chi^2_{(2)} = 0.93$, ns). Even when estimated for the full sample, early-life SES did not have a significant effect on parental supportive presence (see Figure 2b).

In contrast, and consistent with Study 1a, the path from early-life unpredictability to adult parental supportive presence did vary between the genders, supporting the first hypothesis (see Figure 2b). The pattern of results was virtually identical, with early-life unpredictability having a significant negative effect on men's parental supportive presence, but not on women's. When a gender-equality constraint was imposed on the unpredictability path, model fit decreased significantly ($\Delta\chi^2_{(1)} = 7.05$, $p = .008$), indicating a significant Gender × Unpredictability interaction.[6] This interaction effect also emerged using a traditional interaction test in multiple regression (see Figure 3b). The model explained 20% of the variance in men's parental supportive presence, but only 2.5% of the variance in women's parental supportive presence, above and beyond the effects of the control variables.

We also tested whether our effects were confounded with father absence. To do so, we ran the analysis again with a reduced unpredictability measure that did not contain the cohabitation changes items (i.e., boyfriends moving in and out of the house). As

in Study 1a, the results were virtually identical, with early-life unpredictability having a significant effect on men's parental supportive presence ($\beta = -.38$, $p = .008$), but not on women's ($\beta = .12$, ns). Moreover, the interaction remained statistically significant ($\Delta\chi^2_{(1)} = 6.05$, $p = .014$). We also reran the analysis while controlling for early father absence (yes vs. no). Once again, the results were virtually identical. Early-life unpredictability continued to have a significant effect on men's parental supportive presence ($\beta = -.44$, $p = .001$), but not on women's ($\beta = .12$, ns), and the interaction was still significant ($\Delta\chi^2_{(1)} = 7.56$, $p = .006$). Moreover, father absence did not have significant effects on either men's or women's parental supportive presence ($\beta = .12$ and $\beta = -.05$, respectively). In sum, these results indicate that early-life unpredictability effects on parental support are not subsumed by early father absence.

Serial mediation model: The role of maternal supportive presence and attachment representations. Because 35.4% of the participants were observed with their child before age 26 (i.e., before the second AAI assessment), we could not simply rerun the mediation model from Study 1a with the parental supportive presence outcome measure. Doing so would have introduced problems in interpreting the causal sequence between the variables in the model. However, we did not want to drop the second coherence of mind assessment altogether, because for most participants this was the assessment that was closest to the time they were observed in the lab with their child. To resolve this dilemma with minimum loss of data, we carried forward the age-19 coherence of mind scores for all participants observed with their child before age 26. For these participants, in other words, their age-19 coherence of mind score was used in place of their age-26 coherence of mind score. To avoid inflating the path between age-19 and age-26 coherence of mind (and thereby overestimating the indirect effects), we constrained this path to the value obtained without carrying forward age-19 coherence scores (see Figure 5). In this way, we were able to test a mediation model comparable with the one tested in Study 1a.

Similar to Study 1a, paths not expected to vary between the genders were constrained to be equal for men and women. All paths leading to observed parental supportive presence, however, were allowed to vary between the genders (see Figure 5). This model ($\chi^2_{(20)} = 33.33$, $p = .031$; RMSEA $= .084$) fit the data significantly better than a fully constrained (unmoderated) model ($\Delta\chi^2_{(3)} = 15.43$, $p = .001$).

Considering the significant overlap between the two samples, it is not surprising that the paths from early-life unpredictability to maternal supportive presence and from maternal supportive presence to age-19 coherence of mind were very similar to those documented in Study 1a. More importantly, however, the paths from early maternal supportive presence and coherence of mind at age 26 (or 19 for participants who were assessed with their child before age 26) to parental supportive presence were significant for men, just as they were in Study 1a (see Figure 5). The resulting indirect paths explained 94.2% of the total effect of early-life

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[6] This Gender × Unpredictability effect also emerged when gender equality constraints on the SES-to-parenting orientation path and the unpredictability-SES correlation were removed ($\Delta\chi^2_{(1)} = 6.50$, $p = .011$). It also remained significant when SES and all other covariates were excluded from the model ($\Delta\chi^2_{(1)} = 8.41$, $p = .004$).

Table 2

Means, Standard Deviations, and Zero-Order Correlations Between Study Variables for Men and Women (Study 1b)

	1	2	3	4	5	6
1. Early-life unpredictability		−.10	−.14	−.15	−.01	.16
2. Early-life SES	−.23		.24	.01	.24	−.04
3. Maternal supportive presence	−.38*	.17		.35*	.32*	.49***
4. AAI coherence (age 19)	−.34*	−.13	.08		.37**	−.05
5. AAI coherence (age 26)	−.27	.00	−.20	.55***		.22
6. Adult supportive presence	−.45**	.11	.56***	.09	.18	
Mean (Men)	4.56	52.09	4.24	3.20	4.29	4.65
SD (Men)	3.46	10.81	1.34	1.43	1.87	1.29
Mean (Women)	5.32	49.70	4.33	4.02	4.30	4.97
SD (Women)	3.25	9.51	1.37	1.67	1.77	1.14

Note. Correlations above the diagonal are for women; those below the diagonal are for men.
* $p < .05.$ ** $p < .01.$ *** $p < .001.$

unpredictability on parental supportive presence in men (indirect $\beta = -.21$; 95% CI [−.45, −.04]), and they reduced the direct effect of early-life unpredictability in men to nonsignificance ($p = .91$). Approximately 5.9% of the total effect of early maternal supportive presence on men's parental supportive presence went through coherence of mind at ages 19 and 26 (indirect $\beta = .05$; 95% CI [.001, .12]). The mediation model explained 47.6% of the variance in men's parental supportive presence, above and beyond the covariate effects.

Similar to Study 1a, the path from coherence of mind at age 26 to parental supportive presence was not significant for women. Contrary to Study 1a, however, the direct path from early maternal supportive presence to adult parental supportive presence was significant for women as it was for men, albeit somewhat weaker (see Figure 5). Thus, although there was no significant total effect for early-life unpredictability on women's parental supportive presence, there was a significant indirect effect going mainly through early maternal supportive presence ($\beta = -.13$; 95% CI [−.27, −.02]). The mediation model explained 32% of the variance in women's parental supportive presence, above and beyond the covariate effects.

Alternative models.   Consistent with Study 1a, we tested three alternative models in Study 1b. First, we examined whether early maternal supportive presence moderated the relation between early-life unpredictability and adult parental supportive presence.

To do so, we ran our unmediated model again (see Figure 2b) with the addition of early maternal supportive presence and the interaction between early maternal supportive presence and early-life unpredictability. This interaction was nonsignificant for both men ($\beta = .02$) and women ($\beta = -.18$).

Second, we tested an alternative mediation model in which early maternal supportive presence predicted early-life unpredictability rather than the reverse. To do this, we ran the mediation model again (see Figure 5) while switching the roles of these two variables. Unlike our original model, this model did not yield a significant mediated path for men ($\beta = .02$; 95% CI [−.05, .10]), mainly because early-life unpredictability did not predict men's parental supportive presence above and beyond early maternal supportive presence ($\beta = -.03$, *ns*).

Third, we examined the mediating role of early paternal emotional support (reported by the mothers) by running our mediation model again, with the addition of early paternal emotional support as a parallel mediator to early maternal supportive presence. As anticipated, early paternal emotional support was not related to early-life unpredictability, and it did not predict coherence of mind at age 19. More importantly, it did not predict parental supportive presence for either men or women. It also did not influence the other effects in the model (i.e., their significance status remained the same). The results of this additional analysis are provided as supplemental material (see Supplemental Figure S2).
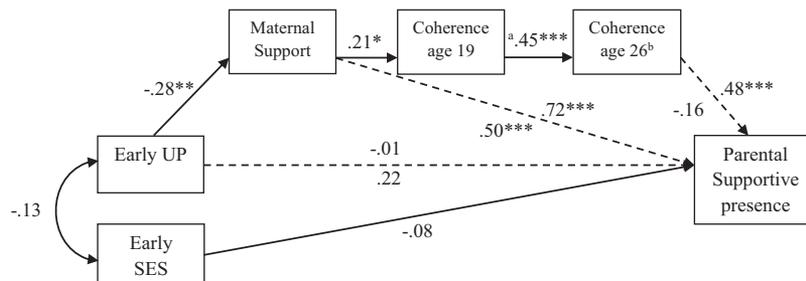

Figure 5.   Multigroup mediation analysis of Study 1b. Dashed paths were allowed to vary between the genders. For these paths, the upper coefficient is for men, and the lower coefficient is for women. Control: Age of parent. [a]Path was constrained to the value of the Beta between coherence at age 19 and coherence at age 26; [b]For individuals below age 26 at the time of assessment ($n = 34$), coherence at age 19 was carried forward. * $p < .05.$ ** $p < .01.$ *** $p < .001.$

Summary and discussion. The results of Study 1b complemented those of Study 1a by showing that experiencing greater unpredictability early in life is not only associated with more negative self-reported parenting orientations, but also with less supportive parenting behavior in men. As in Study 1a, this effect was mediated by early maternal supportive presence and also partially mediated by coherence of mind at ages 19 and 26. Viewed together, these results indicate that the findings of Study 1a—and particularly the gender moderation of the unpredictability effect—are not an artifact of measurement, but reflect real differences in how early rearing environments impact men's and women's parenting.

There are several key differences between the behavioral measure used in Study 1b and the interview measure used in Study 1a, beyond the method of data collection. First, the behavioral measure assessed parental supportive presence, which entails "being there" for your child when he or she needs you the most. The interview measure, on the other hand, assessed a more general attitude-like construct of positive versus negative parenting orientation, which included investment, warmth, and lack of hostility. Second, the behavioral observations took place when children were very young (24 and 42 months) and parents were of various ages, whereas the parenting interview was administered when all of the parents were 32-years-old and their children varied in ages. Finally, the behavioral measure assessed how parents interacted with their specific child, whereas the interview measure assessed attitudes toward all children that a particular parent had. Thus, Studies 1a and 1b complement each other by examining different parenting constructs and using different measurement methodologies, as indicated by the moderate correlation between the two measures ($r = .32$). When considered in tandem, the results of both studies indicate that early-life unpredictability has enduring effects on various aspects of parenting, especially for men.

A consistent finding in Studies 1a and 1b was the mediating role of early maternal supportive presence through its negative relationship with early-life unpredictability. It should be noted, however, that early-life unpredictability and early maternal supportive presence were both assessed in the first 4 years of the participants' lives, making a strictly causal interpretation somewhat problematic. Nevertheless, this association indicates that parents (in our case, mothers) find it harder to provide supportive care to their children when there is turmoil in their lives. This does not necessarily preclude the possibility that supportive parenting can buffer the effects of some types of environmental stress on parenting (e.g., Ellis et al., 2009). Although we did not find evidence for maternal supportive presence moderation in this sample, others have found similar effects for different outcomes (e.g., Pettit, Bates, & Dodge, 1997). Future studies with larger samples should consider early supportive parenting as both a mediator and a moderator of early-life stress effects.

The only difference between the results of Study 1b and Study 1a is the significant positive path from early maternal supportive presence to women's adult parental supportive presence in Study 1b. This could be attributable to the similarity of the two behavioral parenting measures. Indeed, the parallel effect for men was also quite strong (see Figure 5). It might be that, when it comes to this particular aspect of parenting, parents of both genders rely heavily on their own prior experiences with their parents to guide how they should behave as parents in support-relevant contexts

(e.g., see Belsky et al., 2005). Interestingly, even though women's parenting appeared to benefit from good early supportive care, it was not susceptible to the cascading negative effects of early unpredictability. Compared with men's supportive parenting, women's supportive parenting may be more resilient to negative rearing environments (e.g., high unpredictability) while still flourishing under more positive rearing environments (e.g., high quality of parental care). This possibility should be addressed in future research.

Studies 1a and 1b both have some limitations. The MLSRA sample began with mothers living below the poverty line. Although some mothers enjoyed higher socioeconomic status as the years went on, many remained relatively poor in the early years of their children's lives (Sroufe et al., 2005). This somewhat restricted SES range may have resulted in an underestimation of early-life SES effects. Another limitation of Studies 1a and 1b is the modest sample size. Although the null effects found in Studies 1a and 1b were often close to zero or not in the hypothesized direction, it is important to replicate both the positive and the null findings of both studies with a larger, more representative sample. This was the main goal of Study 2.

Study 2: Replication in a Larger Sample

In Study 2, we sought to replicate the findings of the MLSRA sample using a larger, online sample of parents. To increase the comparability of Study 2 with our previous studies, we modeled our measures of early-life unpredictability and adult parenting orientations after the measures used in Study 1a and 1b. We also tested our models in the same way (e.g., using multigroup path analysis).

The Study 2 sample was different than the MLSRA sample in several noteworthy ways. First, it was much larger. Second, it was cross-sectional rather than longitudinal. Third, it contained retrospective measures of early childhood environments, which led us to extend the early-life period from 0–4 to 0–8 years so that participants had more years in which they could remember and report on their childhoods. Fourth, it included participants who grew up in various SES levels, including higher ones. Fifth, it contained measures of adult attachment anxiety and avoidance rather than attachment security with respect to parents earlier in life. Finally, it did not include measures of early parental supportive presence, given that such measures would have been difficult to obtain in an objective way from participants' own retrospective accounts.

Consistent with findings from Study 1a and Study 1b, we predicted that men (but not women) who reported experiencing more unpredictability within their family environment early in their lives would have more negative parenting orientations. We also expected that this effect would be mediated by attachment anxiety and/or attachment avoidance, such that individuals who reported growing up in more unpredictable environments would also report being more anxiously and/or avoidantly attached, which for men would, in turn, be related to having more negative parenting orientations. Based on the results of Studies 1a and 1b, we did not anticipate any early-life harshness effects on parenting orientations.

Power Analysis

To determine the sample size for Study 2, we conducted an a priori power analysis. Specifically, we tried to determine the approximate sample size required to detect an early unpredictability effect on parenting orientations, based on data from Study 1a. For this purpose, we used a method by Dupont and Plummer (1998) for power calculations in linear regression and used their software (PS: Power and Sample Size Calculation version 3.1.2, 2014).[7] The minimum sample size needed to obtain a significant early-life unpredictability effect with 80% power was 93, assuming a population effect similar to the sample effect found for men in Study 1a ($\beta = .28$). The sample size required for 95% power was 153. Because the unpredictability effects for women in Studies 1a and 1b were not in the expected direction, we could not estimate the power specifically for women. However, because we wanted to make sure that a null effect for women was not due to lack of power, we sampled twice as many women as men. Thus, we set out to sample approximately 150 men and 300 women. The actual sample size for women ($n = 292$) provided 99.9% power to detect a beta of .28, 94.4% power to detect a beta of .20, and 75.9% power to detect a beta of .15.

Method

Participants. Study 2's sample included 435 parents (143 men, 292 women) who were recruited through an online survey platform (MTurk). Participants varied in age ($M = 37.87$, $SD = 12.20$) and years of education ($M = 14.96$, $SD = 2.35$). They were parenting between one and 12 children ($M = 1.94$, $SD = 1.19$). Most participants (82.8%) were married or in a committed romantic relationship at the time of the study. The rest were single (8.7%) or casually dating (8.5%). Participants received a small monetary compensation for their participation.

Procedure and measures. Participants first completed screening questions making sure they were parents. They then completed an online survey that included the following measures:

Early-life unpredictability. We modeled our early-life unpredictability measure after the unpredictability measure used in Studies 1a and 1b. Thus, participants completed three items about their early childhood (up to age 8) that corresponded to the three items used in the longitudinal analyses. These items were: (a) "In your early childhood, did your parents or legal guardians change jobs or occupational status?;" (b) "In your early childhood, were there changes to your place of residence?;" and (c) "In your early childhood, were there changes in your familial circumstances? (divorce or separation of parents, parents starting new romantic relationships, parents leaving the home, etc.)." Each item was rated on a scale ranging from 1 (*never*) to 5 (*many times*). These items were averaged to create a retrospective early-life unpredictability measure (Cronbach's alpha = .68).

Early-life harshness. Similar to Studies 1a and 1b, we used childhood SES as a measure of early-life harshness. Participants indicated their agreement with four statements regarding their socioeconomic status when they were growing up (up to age 8) using a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). These items were: (a) "My family usually had enough money for things when I was growing up;" (b) I grew up in a relatively wealthy neighborhood;" (c) "I felt relatively wealthy compared with the other kids in my school;" and (d) "My family

struggled financially when I was growing up" (reverse-keyed). The first three items were taken from Griskevicius, Delton, Robertson, and Tybur (2011) and Griskevicius, Tybur, Delton, and Robertson (2011). The negatively keyed item was written for the current study. These items were averaged to create a retrospective early-life harshness measure (Cronbach's alpha = .86).

Attachment anxiety and avoidance. Adult attachment orientations were assessed via the Adult Attachment Questionnaire (AAQ; Simpson, Rholes, & Phillips, 1996). The AAQ has 17 items that measure two dimensions of attachment insecurity: anxiety and avoidance. The anxiety subscale includes nine items tapping concerns about the availability and support of significant others and a high desire for closeness and intimacy (e.g., "I rarely worry about being abandoned by others (reverse-keyed)," "I usually want more closeness and intimacy than others do"). The avoidance subscale has eight items tapping the desire to limit intimacy and maintain psychological and emotional independence from significant others (e.g., "I'm not very comfortable having to depend on other people," "I'm nervous whenever anyone gets too close to me"). Participants indicated their agreement with each item on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The items for each subscale were averaged to create attachment anxiety and attachment avoidance measures (Cronbach's αs = .84 and .86, respectively).

Parenting orientation. For the purposes of this study, we created a 15-item self-report questionnaire assessing positive versus negative parenting orientations. This questionnaire was modeled after the parenting orientation measure used in Study 1a. Five items were created for each of the three scales comprising this measure, namely: (a) *positive emotional connectedness*, which assesses the amount of warmth expressed toward children and the pleasure of being a parent (e.g., "My relationship with my children is warm and affectionate," "I love being around my children"); (b) *parental investment/involvement*, which assesses the amount of importance placed on being a parent and being committed to parenting (e.g., "I am highly invested in my role as a parent," "I try to be very involved in the lives of my children"); and (c) *hostile parenting* (reverse-keyed), which assesses the amount of derogation or rejection of children (e.g., "I think my children have plenty of negative characteristics," "My children have often been a source of anger and frustration in my life"). Participants indicated their agreement with each item on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

We then conducted a confirmatory factor analysis on the 15 items that constituted the parenting orientation scale. The hypothesized three-factor model yielded good approximate fit indices (CFI = .957, RMSEA = .071, SRMR = .041), but the three factors were highly correlated (*r*s ranged from .92 to .98). Thus, we averaged the items from the entire scale (with the hostility scale items reverse-keyed) to create a parenting orientation measure (Cronbach's alpha = .90). Higher scores indicated a more positive orientation to parenting. The full scale is presented as online supplemental material.

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[7] This software can be downloaded for free from the following URL: http://biostat.mc.vanderbilt.edu/wiki/Main/PowerSampleSize. Because the power to detect a particular regression slope in multiple regression is affected by the correlations between all of the covariates included in a model, our analysis only approximated the necessary sample size.

Current unpredictability and harshness. As in Study 1a and 1b, we also assessed analogous measures of current unpredictability and harshness to control for shared environment effects. The current unpredictability measure was comprised of the same items as the early-life unpredictability measure, except they inquired about whether each event had occurred in the past year (yes or no). Current unpredictability scores were computed by summing the number of times participants answered positively (indicated yes).

The current harshness measure contained three items taken from Griskevicius, Delton et al. (2011) and Griskevicius, Tybur et al. (2011) and one negatively keyed item written for the current study. These items were: (a) "I have enough money to buy things I want;" (b) I do not need to worry too much about paying my bills;" (c) "I feel relatively wealthy these days;" and (d) "Often I don't have enough money to get me through the month" (reverse-keyed). The items were averaged to create a current harshness score (Cronbach's alpha = .86).

Partial father absence. Only 19 participants reported complete father absence (due to death or abandonment), which precluded quantitative analyses using this variable. However, 91 participants reported parental divorce or separation during their first 8 years of life. Thus, these participants spent at least part of their early childhood in a single-parent household. Therefore, we used the parental separation variable (excluding participants who reported maternal absence) as a proxy for partial father absence.

Missing Data

The Study 2 sample had very little missing data. Among the major variables, only early-life harshness (SES) was missing for one participant. In addition, a few participants had missing values on a few of the control variables. Therefore, we used Full Information Maximum Likelihood (FIML) to fit our models.

Results and Discussion

Descriptive statistics and zero-order correlations for the study variables are presented in Table 3, separately for men and women. Bonferroni-corrected contrasts revealed only one statistically significant mean difference between the genders: Women reported higher (more positive) parenting orientations than men did.

To be consistent with Studies 1a and 1b, we tested all of our models using multigroup path analysis. First, we fitted an unmediated model in which early-life harshness and early-life unpredictability predicted parenting orientation (see Figure 2c). Second, we fitted a mediation model in which the effect of early-life unpredictability on parenting orientation was mediated by attachment avoidance and attachment anxiety (see Figure 6). All analyses were conducted using AMOS version 19. For all analyses, we controlled for participants' age, current unpredictability, current SES, years of education, relationship status, and number of children.

Unmediated model: The effects of early-life unpredictability and harshness on parenting orientation. The unmediated model examined the first hypothesis: that men who experienced more harshness and/or unpredictability early in life should have more negative parenting orientations. In line with Studies 1a and 1b, gender did not moderate the effect of early-life SES (harshness) on parenting orientation. It did, however, moderate the

negative correlation between early-life unpredictability and early-life SES ($\Delta\chi^2_{(1)} = 6.28$, $p = .012$), with the correlation being significant only for women. Because we had no theoretical reason to expect this moderation, and in order to maintain consistency with the models tested in Studies 1a and 1b, we constrained both parameters to equal across the genders regardless of the minor reduction in model fit ($\Delta\chi^2_{(2)} = 8.78$, $p = .012$). Similar to Studies 1a and 1b, early-life SES did not have a significant effect on parenting orientations (see Figure 2c).

The path from early-life unpredictability to adult parenting orientations varied between the genders, supporting the first hypothesis and replicating the results of Studies 1a and 1b (see Figure 2c). That is, early-life unpredictability had a significant negative effect on men's parenting orientations, but not on women's. When a gender-equality constraint was imposed on the unpredictability path, model fit decreased significantly ($\Delta\chi^2_{(1)} = 5.54$, $p = .019$), indicating a significant Gender × Unpredictability interaction.[8] This interaction effect also emerged using a traditional interaction test in multiple regression (see Figure 3c). The model explained 10.2% of the variance in men's parenting orientations, but only 0.4% of the variance in women's parenting orientations, above and beyond the effects of the control variables.

As in Studies 1a and 1b, we also examined whether our effects were confounded with father absence. To do so, we ran the analysis again with a reduced unpredictability measure that did not include the cohabitation changes item. Consistent with Studies 1a and 1b, the results were virtually identical, with early-life unpredictability once again having a significant effect on men's parenting orientations ($\beta = -.22$, $p = .023$), but not on women's ($\beta = .01$, ns). Moreover, the interaction was statistically significant ($\Delta\chi^2_{(1)} = 5.53$, $p = .019$). We next reran the analysis controlling for partial father absence due to parental separation (yes vs. no). Once again, the results were virtually identical. Early-life unpredictability continued to have a significant negative effect on men's parenting orientations ($\beta = -.26$, $p = .007$), but not on women's ($\beta = .04$, ns), and the interaction remained statistically significant ($\Delta\chi^2_{(1)} = 6.96$, $p = .008$). Moreover, partial father absence did not have significant effects on either men's or women's parenting orientations ($\beta = .11$ and $\beta = -.08$, respectively). These results join Studies 1a and 1b in demonstrating that early-life unpredictability forecasts men's parenting orientations, over and above early partial father absence.

Parallel mediation model: The role of attachment anxiety and avoidance. An additional goal of Study 2 was to test specific indirect paths from early-life unpredictability to parenting orientations through attachment anxiety and avoidance. To do this, we examined a mediation model in which attachment anxiety and attachment avoidance were parallel mediators of the relation between early-life unpredictability and parenting orientations (see Figure 6). Similar to Studies 1a and 1b, all paths leading to the parenting orientation measure were allowed to vary between the genders. In contrast, paths not expected to vary between the genders were constrained to be equal for men

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[8] This Gender × Unpredictability effect also emerged when gender equality constraints on the SES-to-parenting orientation path and the unpredictability-SES correlation were removed ($\Delta\chi^2_{(1)} = 6.68$, $p = .01$). It also remained significant when SES and all other covariates were excluded from the model ($\Delta\chi^2_{(1)} = 13.43$, $p < .001$).

Table 3

Means, Standard Deviations, and Zero-Order Correlations Between Study Variables for Men and Women (Study 2)

	1	2	3	4	5
1. Early-life unpredictability		−.31***	.18**	.10	.03
2. Early-life SES	−.08		−.12*	−.03	−.03
3. AAQ attachment anxiety	.38***	−.01		.43***	−.18**
4. AAQ attachment avoidance	.28***	−.11	.53***		−.23***
5. Positive parenting	−.31***	−.11	−.51***	−.44***	
Mean (Men)	2.11	3.73	3.06	3.47	5.78
SD (Men)	.94	1.42	1.11	1.21	1.00
Mean (Women)	2.11	3.46	3.10	3.53	6.21
SD (Women)	.88	1.67	1.27	1.25	.67

Note. Correlations above the diagonal are for women; those below the diagonal are for men.
* $p < .05$. ** $p < .01$. *** $p < .001$.

and women. These included the paths from early-life unpredictability to attachment anxiety and attachment avoidance. Preliminary analyses indicated that, although these paths were significant for men ($\beta = .25$, $p < .001$ for anxiety, and $\beta = .21$, $p = .006$ for avoidance) but not for women ($\beta = .11$, $p = .062$ for anxiety, and $\beta = .06$, $p = .322$ for avoidance), they did not vary significantly between the genders ($\Delta\chi^2_{(2)} = 3.07$, *ns*). By constraining them to be equal between the genders, we avoided capitalizing on chance differences that might have inflated the indirect paths for men. This model fit the data well ($\chi^2_{(9)} = 15.09$, $p = .088$; RMSEA = .04) and significantly better than a fully constrained (unmoderated) model ($\Delta\chi^2_{(3)} = 17.13$, $p < .001$).

The results of this analysis are presented in Figure 6. As predicted, early-life unpredictability was associated with more attachment anxiety and avoidance. Both of these variables were negatively associated with men's parenting orientations, but only attachment avoidance was negatively associated with women's parenting orientations. The total indirect effect from early-life unpredictability to parenting orientation in men was significant and explained 58.3% of the total effect of early-life unpredictability ($\beta = -.10$; 95% CI [−.18, −.04]). Moreover, the direct effect of early-life unpredictability in men was reduced to nonsignificance ($p = .387$). Interestingly, the total

indirect effect from early-life unpredictability to parenting orientation was also significant in women ($\beta = -.03$; 95% CI [−.06, −.01]). This, however, was mainly due to the gender equality constraints placed on the links between early-life unpredictability and attachment orientations. When these constrains were removed, there was no significant indirect effect for women ($\beta = -.02$; 95% CI [−.05, .01]) and the indirect effect for men increased markedly ($\beta = -.16$; 95% CI [−.28, −.06]). The mediation model as shown in Figure 6 explained 29.8% of the variance in men's parenting orientations, but only 7.1% of the variance in women's parenting orientations, above and beyond the covariate effects.

To examine the two specific indirect paths through attachment anxiety and attachment avoidance, we applied a phantom model approach (Macho & Ledermann, 2011). In this approach, the specific effect of interest is represented as a total effect within a phantom model. This enables SEM programs to provide point estimates and confidence intervals for specific indirect effects. Specifically, a phantom model is created beside the main model. In the phantom model, each variable involved in the specific indirect effect is represented by a latent variable. The paths linking these latent variables recreate the specific indirect path to be estimated and are constrained to their value in the main model. The variance of the phantom independent
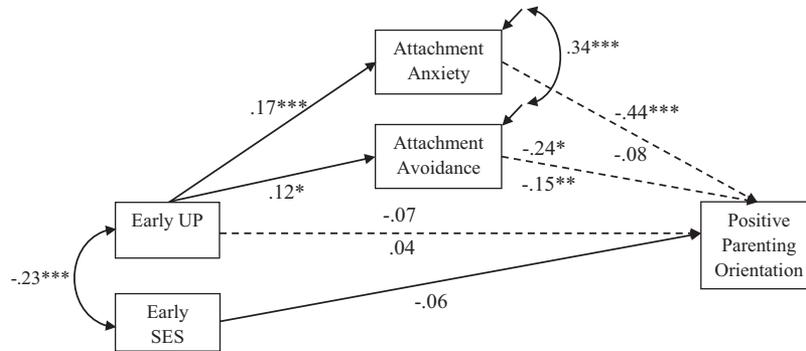

Figure 6. Multigroup analysis of Study 2. Dashed paths were allowed to vary between the genders. For these paths, the upper coefficient is for men, and the lower coefficient is for women. Controls: Age of parent, current unpredictability, current SES, educational attainment, relationship status, and number of children. * $p < .05$. ** $p < .01$. *** $p < .001$.

variable is also constrained to some admissible value. This method also allows for the comparison of specific indirect effects (see Macho & Ledermann, 2011).

When we ran these models, both specific indirect paths were significant for men (β = −.075, 95% CI [−.14, −.02] for anxiety, and β = −.03, 95% CI [−.07, −.001] for avoidance), as expected. There was no significant difference between the paths (95% CI [−.02, .12]). In contrast, only the specific indirect path going through avoidance was significant for women (β = −.02, 95% CI [−.04, −.002]), but not the indirect path going through anxiety (β = −.01, 95% CI [−.03, .003]). These two paths were not significantly different (95% CI [−.03, .02]).

Alternative models. A large body of evidence shows that secure attachment can buffer the effects of stress on various outcomes (see Mikulincer & Shaver, 2007). Hence, we tested an alternative model in which attachment anxiety and avoidance moderated (rather than mediated) the relation between early-life unpredictability and parenting orientation. We ran our unmediated model again (see Figure 2c) with the addition of attachment anxiety, avoidance, and all the interactions between these variables and early-life unpredictability. These interactions were not significant for either men (β = .16 and β = −.06, respectively) or women (β = .01 and β = .03, respectively).

In addition, we followed Study 1a by testing whether early-life harshness effects or early-life unpredictability effects for women emerged in the presence of current harshness or unpredictability. To do so, we ran the unmediated model again with the addition of all two-way interactions between early-life SES and unpredictability and current SES and unpredictability. Similar to Study 1a, these interactions did not reveal any conditional early-life SES or unpredictability effects.

Summary and discussion. Study 2 provides independent replication of the negative effect of early-life unpredictability on men's parenting orientation. It also replicates the null results for early-life harshness, providing further evidence that early-life unpredictability is a better predictor of men's adult parenting than early-life harshness. In addition, Study 2 replicates the null results for women, indicating that women's parenting is more resilient to the effects of early-life unpredictability than men's parenting.

Study 2 provides another unique contribution by revealing that the effect of early-life unpredictability on the parenting orientation of men is mediated through both attachment anxiety and attachment avoidance. That is, men who reported growing up in more unpredictable environments were more likely to be anxiously or avoidantly attached, both of which were associated with more negative parenting orientations. Given the cross-sectional nature of Study 2, caution is warranted when inferring any causal connections between these variables. This is especially true of the paths running from attachment anxiety and avoidance to parenting orientation. Nevertheless, the mediation results of Study 2 are consistent with the prospective mediation results of Studies 1a and 1b in indicating that, for men, insecure attachment is associated with more negative parenting orientations. In sum, attachment insecurity appears to play a role in carrying forward some of the early-life unpredictability effects on men's parenting orientations.

General Discussion

The notion that early childhood experiences have lasting effects on personality and development is a central theme in psychology (e.g., Fraley, Roisman, & Haltigan, 2013; Sroufe et al., 2010). Life history models of development highlight the unique role that environmental parameters such as harshness and unpredictability should play in "calibrating" life history strategies (e.g., Belsky et al., 1991; Chisholm et al., 1993; Ellis et al., 2009; Simpson & Belsky, in press). One fundamental life history outcome is parental investment (Belsky et al., 1991; Kaplan & Lancaster, 2003), which has rarely been examined with longitudinal, prospective data through the lens of life history theory. The current research begins to fill this important gap in our knowledge. We provide evidence supporting a life history model of how parenting orientations and behavior emerge across the life span. Our findings suggest that men's parenting orientations and behavior are at least partially influenced by exposure to more unpredictable family environments and less supportive parenting during the first years of life. They also reveal that these effects are partially mediated by insecure attachment in adulthood. This is the first set of studies, to our knowledge, that demonstrates the significant role that early-life unpredictability assumes in predicting more negative parenting orientations and behavior in men later in life.

Paternal Investment Under Adversity

As predicted, we found that men's adult parenting orientations and behavior were more dependent than women's on the quality of their early childhood environments. These findings are consistent with the premise that men and women have different psychological mechanisms associated with parenting (e.g., Geary, 2000). If male parenting was more facultative in our ancestral past, men's psychological mechanisms might lead them to more readily "disengage" from their children *under certain conditions* (see Geary, 2000). There is evidence, for example, that fathers tend to be less involved with their children when they encounter adversity in their personal lives (e.g., Fagan, Palkovitz, Roy, & Farrie, 2009) or have conflicts with their mates (e.g., Lamb & Elster, 1985).

Most fathers, of course, play important roles in the growth and development of their children (Gray & Anderson, 2010; Parke, 1996). Given the unquestionable importance of fathers to children's development and outcomes (see Geary, 2000), it is important to identify the types of early-life environments and childhood experiences that prospectively predict greater involvement and investment by fathers. Our findings reveal that being exposed to frequent changes in the family environment early in life—rather than simply growing up in harsh socioeconomic conditions—forecasts more negative parenting orientations in men. Moreover, consistent with theory and research linking chaotic family environments with greater parental dysfunction (e.g., Amato & Keith, 1991), this connection is mediated by exposure to less supportive parenting early in life. Exposure to less supportive parenting, however, is not merely "replicated" by individuals when they become parents. Rather, it is internalized in the form of attachment representations of how one was parented and treated earlier in life (Bowlby, 1969/1982). Children who experience less supportive parenting are more likely to develop negative expectations about whether and the extent to which they can rely on close others to help them navigate an unpredictable world. As a result, they

develop personality characteristics and behaviors that increase the likelihood they will succeed in these difficult environments (see Simpson & Belsky, in press). For men who have been exposed to unpredictable and less supportive childhood environments, this translates into comparatively less parental involvement (Fagan et al., 2009; Geary, 2000).

Limitations and Future Directions

Some limitations must be considered when interpreting the results of this research. First, even though our early-life unpredictability measure was consistent with prior studies (e.g., Belsky, Schlomer, & Ellis, 2012; Simpson et al., 2012), unpredictability can be operationalized in other ways. For example, it can be indexed by the actual variability in harshness levels across time (e.g., Ellis et al., 2009). This, however, would require multiple assessments of harshness across relatively short time spans. Future studies should experiment with different ways of conceptualizing and measuring environmental unpredictability.

Second, we recommend caution in overinterpreting the null effects of early-life SES (harshness) on parenting orientations and behavior. It is important to note that harshness levels in our modern American samples are quite low compared with the prehistoric levels of harshness under which human developmental mechanisms most likely evolved. It is possible, therefore, that these modern harshness levels do not pass the threshold required to initiate strategic adjustments in parenting effort. Another possibility is that even though SES is often used to index harshness (e.g., Belsky, Schlomer, & Ellis, 2012; Simpson et al., 2012), it is too crude of a measure to detect the effects of harshness on parenting, given the unique properties of parenting behavior and how it may relate to different levels and types of harshness. Harsh ancestral environments in which fathers could not have improved the survival rates of their children (such as pathogen-prevalent environments) should have suppressed paternal investment. By contrast, in consistently harsh ancestral environments (e.g., consistently bad climates, prolonged and severe resource scarcity), high investment from *both* parents may have been essential for children to survive. Moreover, in these environments, women may have required a higher minimum investment from potential mates, creating a "mating incentive" for men to invest in their children (see Gangestad & Simpson, 2000). These environments, therefore, may have elicited slower life history strategies that involved higher maternal *and* paternal investment (Ellis et al., 2009; Kaplan & Lancaster, 2003). Thus, rather than being responsive to overall levels of harshness (as indexed by SES), men's and women's developmental mechanisms may respond differentially to different types of harshness, especially with regard to parenting (Ellis et al., 2009).

Third, we urge caution in interpreting the null results for the mediation through father's emotional support in Studies 1a and 1b. As noted previously, the mother-reported measures of early paternal emotional support that were available in the MLSRA were not of the same quality as the observer-rated behavioral measures of early maternal supportive presence. More importantly, mothers were the primary (and sometimes single) caregivers of most of the MLSRA participants (Sroufe et al., 2005), so it stands to reason that mothers were particularly important in this sample. In fact, the effects of maternal supportive presence in Studies 1a and 1b could be construed as primary-caregiver supportive presence effects. As

such, we would expect to find similar effects for early paternal supportive presence in individuals for whom fathers or both parents served as primary caregivers. Given the substantial literature linking father absence to girls' reproductive development (Ellis, 2004) and the important role that fathers play in the lives of their children (Gray & Anderson, 2010; Parke, 1996), future studies should assess and model both parents' caregiving quality whenever possible.

Finally, our research does not address the issue of genetic heritability of parenting orientations and behavior (e.g., McGuire, Segal, & Hershberger, 2012). For example, heritability might explain some of the large effect from received maternal supportive presence to parental supportive presence in Study 1b. However, genetic heritability cannot easily explain the sex difference found for this path in Study 1a. In addition, it is difficult for a genetic explanation to fully account for the gender-differentiated unpredictability effect we found in all of our studies. Although genes probably play a role in the intergenerational transmission of parenting orientations and behavior (Conger, Belsky, & Capaldi, 2009), they most likely do not account for all of our findings.

Conclusion

In conclusion, parenting is a major component of human reproduction, which is the engine of natural selection. As such, the psychology of parenting should have been shaped by certain selection pressures (Geary, 2000; Kaplan & Lancaster, 2003). Life history theory provides a powerful framework through which one can gain a deeper understanding of how certain environments give rise to different parenting psychologies. This approach stimulates research via the generation of novel hypotheses about human social development. In addition, by identifying the early environmental and familial antecedents of parenting orientations and behavior, life history theory can inform early interventions designed to break the cycle of negative or dysfunctional parenting.

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New Editors Appointed

The Publications and Communications Board of the American Psychological Association announces the appointment of 6 new editors. As of January 1, 2016, manuscripts should be directed as follows:

- *American Psychologist* (www.apa.org/pubs/journals/amp/) **Anne E. Kazak, PhD, ABPP,** Nemours Children's Health Network, A.I. du Pont Hospital for Children

- *Developmental Psychology* (http://www.apa.org/pubs/journals/dev/) **Eric F. Dubow, PhD,** Bowling Green State University

- *International Perspectives in Psychology: Research Practice, Consultation* (www.apa.org/pubs/journals/ipp/) **Stuart Carr, PhD,** Massey University

- *Journal of Consulting and Clinical Psychology* (www.apa.org/pubs/journals/ccp/) **Joanne Davila, PhD,** Stony Brook University

- *School Psychology Quarterly* (www.apa.org/pubs/journals/spq/) **Richard Gilman, PhD,** Cincinnati Children's Hospital Medical Center

- *Sport, Exercise and Performance Psychology* (www.apa.org/pubs/journals/spy/) **Maria Kavussanu, PhD,** University of Birmingham, UK

Electronic manuscript submission: As of January 1, 2016, manuscripts should be submitted electronically to the new editors via the journal's Manuscript Submission Portal (see the website listed above with each journal title).

Current editors Norman Anderson, PhD, Jacquelynne Eccles, PhD, Judith Gibbons, PhD, Arthur M. Nezu, PhD, Shane R. Jimerson, PhD, and Jeffrey J. Martin, PhD will receive and consider new manuscripts through December 31, 2015.