The effects of morbidity-mortality and economic unpredictability on parental distress: A life history approach

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Abstract

Negative affect caused by stressful life events can carry over to parental relationships and induce parental distress. Such spillover effects, however, may not operate uniformly in men and women, and may not be the same for different types of stressful life events. Employing life history theory, we hypothesized that male parents should experience more parental distress following exposure to cues of extrinsic morbidity-mortality (illness or death of someone close) or economic unpredictability (financial or occupational changes). We tested this hypothesis in two studies. In Study 1 (N = 207), recent exposures to morbidity-mortality and economic unpredictability were uniquely associated with parental stress, but the effect of economic unpredictability existed only in men. Stronger unpredictability beliefs partially mediated these effects. Moreover, morbidity-mortality and economic unpredictability were indirectly associated with less positive parenting through greater parental stress. Study 2 used a dyadic sample of 105 families transitioning to parenthood. Recent exposures to morbidity-mortality and economic unpredictability were uniquely associated with parental distress (parental stress and postpartum depression) in men only, whereas exposure to other sources of stress was

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more strongly associated with women’s parental distress. The effects of morbidity-mortality on men’s parental distress were mediated by their lower parental self-efficacy. These findings imply that men’s parental experiences are particularly vulnerable to risky and unpredictable environments.

**Keywords**
Evolution, life history theory, morbidity and mortality, parental stress, parenting, stress, unpredictability

Parenting can be a rewarding experience that provides meaning and purpose. Many parents, however, experience periods in which they feel depleted and strained by their parenting duties, especially when facing other stressors. Financial pressures introduced by economic adversity, for example, can increase parental distress and carry over to parental relationships (Conger et al., 2002). Such effects have often been explained as spillover effects (Repetti & Wang, 2017). In the current research, we present a novel way of understanding the link between stressful events and parental distress based on evolutionary life history principles. We propose that certain stressful events provide information about important environmental parameters that alter the adaptive value of parenting, especially for men. When experienced, these events trigger an adaptive shift in parental cognitions and emotions that is manifested in a more negative parental experience and greater parental distress.

We focus on two environmental parameters that alter the adaptive value of parenting: the rate of extrinsic morbidity-mortality and the degree of unpredictability. In Study 1, we examine whether parents who were recently exposed to morbidity-mortality or economic unpredictability experience more parental stress, whether these effects are mediated by unpredictability beliefs, and whether these effects are reflected in less positive parenting. In Study 2, we employ a dyadic design to examine whether parents who were recently exposed to morbidity-mortality or economic unpredictability experience more parental distress (a combination of parental stress and postpartum depression) and whether these effects are mediated by lower parental self-efficacy. In both studies, we examine whether morbidity-mortality and economic unpredictability effects are stronger in men than in women. The current research is the first to apply an evolutionary life history perspective to the study of parental distress. Therefore, it offers a unique and valuable contribution to both the life history and the parenting literatures.

**Individual differences in the experience of parental stress**
Parental stress is an aversive psychological reaction to the demands of being a parent. It occurs when parents feel they do not have the mental or social resources to function well in their parenting roles. Parental stress is associated with negative parental cognitions and behaviors and with children’s maladjustment, making it an important parental variable (Deater-Deckard, 1998). It is related to how parents perceive and cope with the
demands of parenting. For example, parents who feel more competent and in control of
their own lives experience less parental stress (Hassall et al., 2005).

One factor that has not received enough attention in relation to parental stress is the
degree to which parents are psychologically inclined to invest energy and resources in
parenting. While an integral part of reproduction, parenting presents numerous chal-
lenges that not all individuals are psychologically equipped to handle, and it requires
numerous sacrifices that not all individuals are willing to make. The degree to which
individuals are willing and able to meet the challenges of parenting should influence how
these challenges are perceived and how much parental stress they elicit. We now present
a life history perspective postulating that such individual differences are a reflection of
different reproductive strategies, which are enacted under different environmental
circumstances.

**Life history theory and parenting**

Life history theory (LHT) is an evolutionary framework that seeks to explain the
emergence of individual differences through the strategic tradeoffs that individuals make
when allocating resources and energy to important facets of development such as growth
and reproduction, and the ecological constraints that influence the viability of alternative
allocation strategies (Kaplan & Gangestad, 2005). One major reproductive tradeoff is
between improving the condition of existing children through parenting and creating
additional children through mating (the mating-parenting tradeoff). Because energy and
resources are limited, individuals usually have a choice between investing heavily in
fewer children or having more children and investing less in each one. Each strategy
could contribute to reproductive success, but each involves very different behaviors and
psychological traits.

Variability in the allocation of energy and resources to parenting versus mating is
driven in large part by the fact that each of these reproductive strategies is adaptive under
different environmental conditions (Kaplan & Gangestad, 2005). According to LHT,
humans have psychological mechanisms designed by natural selection that respond to
environmental input by facultatively adjusting reproductive strategies to maximize fit-
ness in a given environment (Gangestad & Simpson, 2000). Consequently, individuals
are disposed to shift to a different reproductive strategy when exposed to environmental
characteristics that alter the value of any given strategy. Environments in which the
benefits of parental investment outweigh the costs (or the benefits of investing in mating)
should generate cognitions, emotions, and behaviors that facilitate effective parenting,
which in turn should increase the ability of parents to cope with the demands of being a
parent. Parents in these environments should experience parenting as less burdensome
and, thus, should experience lower parental stress. In contrast, environments in which the
costs of parental investment (or the benefits of investing in mating) outweigh the benefits
should generate cognitions, emotions, and behaviors that suppress effective parenting,
which in turn should reduce the ability of parents to cope with the demands of being a
parent. Parents in these environments should experience parenting as more burdensome
and, hence, should experience greater parental stress. We will now discuss the envi-
ronmental conditions that modify the costs and benefits of parenting.
Environmental parameters altering the value of parenting

The costs and benefits of parenting are contingent on two basic environmental parameters: extrinsic morbidity-mortality and unpredictability (Ellis et al., 2009). *Extrinsic morbidity-mortality* (henceforth: morbidity-mortality) refers to sources of disability and death that are relatively insensitive to the adaptive decisions that individuals make (e.g., disease, violence, war). *Environmental unpredictability* reflects the degree of variability in an individual’s local ecology (e.g., frequent changes in resource availability). Investing in parenting is more adaptive in safe and predictable environments in which individuals can take their time to accrue material and embodied capital (e.g., resources, skills) that can then be invested in their children (Ellis et al., 2009). Because risk is low and the future can be predicted, parents can reasonably expect that their parental investments will eventually pay off (i.e., their children will survive and reproduce). But when environments are unpredictable and morbidity-mortality rates are high, investing heavily in fewer children becomes less adaptive. In such environments, the probability of dying before reproducing is greater, making it more beneficial for individuals to reproduce early and have more children to ensure that at least some of them survive and reproduce. Moreover, because the future is uncertain, parents cannot predict the outcome of their parental investments. In such conditions, investing heavily in only a few children exposes parents to the risk of losing their entire investment due to some calamity or a radical change in environmental conditions.

While many studies have shown that individuals adopt more mating-centered reproductive strategies when exposed to markers of morbidity-mortality or unpredictability during their lives (e.g., Belsky et al., 2012; Simpson et al., 2012), evidence is more limited for parenting. In one population-level study, maternal care was negatively associated with war and famine and paternal involvement was negatively associated with pathogen load, both markers of morbidity-mortality (Quinlan, 2007). In another study, living in a good, low-risk neighborhood was positively associated with length of breastfeeding and paternal involvement (Nettle, 2010). Another common proxy of morbidity-mortality is low SES (e.g., Simpson et al., 2012; Szepsenwol et al., 2017). The association between low SES and negative parental behaviors is well documented (e.g., Conger et al., 2002).

There is also some evidence for the relation between unpredictability and parenting. In one longitudinal study, environmental unpredictability (residential changes, parental transitions, and job changes) during the 5 years post-birth predicted increased maternal depressive symptoms and lower maternal sensitivity (Belsky et al., 2012). In another longitudinal study, unpredictability during the first 4 years of life, measured in the same way, prospectively predicted more negative parenting orientations and behaviors in men, but not in women, nearly 30 years later (Szepsenwol et al., 2015).

Other studies have used experimental designs to examine the proximate effects of morbidity-mortality and unpredictability on reproductive strategies and related behaviors. Unlike developmental effects, which involve facultative adjustments to development that occur during ontogeny to match reproductive strategies to future environmental conditions, proximate effects involve relatively instantaneous psychological and behavioral adjustments to match *current* conditions (Gangestad & Simpson, 2000). For example, participants exposed to subtle mortality primes (e.g., reading a news
article about violent crime rates) expressed a desire to have children at a younger age, which is indicative of a reproductive strategy prioritizing the number of children rather than the quality of care given to each child (Griskevicius et al., 2011). Participants exposed to economic uncertainty primes (e.g., reading a news article about economic recession, viewing pictures of foreclosed homes and unemployment lines) displayed behavioral tendencies that should undermine effective parenting, such as enhanced impulsivity and risk-taking (Griskevicius et al., 2013). In both cases, the effects were limited to individuals who reported growing up in relatively adverse conditions.

Although priming studies inform us about the proximate effects of unpredictability and morbidity-mortality on reproductive strategies, they inevitably exchange ecological validity for internal (experimental) validity. Moreover, they cannot match the intensity and impact of actually experiencing morbidity-mortality or unpredictability. Indeed, people are often exposed to cues of morbidity-mortality and unpredictability during their daily lives. Personal knowledge of deaths of friends or family members, for example, is a powerful cue of morbidity-mortality (Ellis et al., 2009), just as frequently changing jobs is a cue of unpredictability. No research to date has documented the unique proximate effects of morbidity-mortality and unpredictability on parenting outcomes or has examined their impact on the psychological wellbeing of parents. Because parents cannot easily set aside their parenting duties whenever they are exposed to morbidity-mortality or unpredictability, such exposure may cause them to experience elevated distress related to their parenting roles. These important gaps in the literature are addressed in the current research.

Sex differences in parenting

Another notable limitation of most of the current literature is the relative lack of consideration given to differences between men and women in the reproductive tradeoffs they face. One way in which LHT differs from other theories that address the effects of environmental stress on parents (e.g., Conger et al., 2002; Cox & Paley, 1997) is in considering that parenting has different costs and benefits for women and men. Szepsenwol et al.’s (2015) findings highlight the asymmetry between women’s and men’s parenting, which is manifested in different reactions to early exposure to unpredictability. According to parental investment theory (Trivers, 1972), this asymmetry exists because women have higher obligatory initial parental investment than men (i.e., internal fertilization, gestation, nursing). Because men do not have to make these initial investments, they can more effectively increase their reproductive success by shifting to a mating-centered strategy and thereby reduce their parental investment when conditions favor it, such as when morbidity-mortality and unpredictability are high. Through this shift, men can increase their number of offspring, which is more favorable in risky, unpredictable environments. Moreover, because parental investment comes at the expense of investing in mating, men incur a greater opportunity cost if they continue to invest in parenting in mating-favorable environments. For these reasons, men’s parenting psychology should be more responsive to cues of morbidity-mortality and unpredictability than is true for women. Men, therefore, should experience parenting as more taxing and burdensome than women in such conditions and should experience greater parental stress when enacting their role as parents.
The current research

The purpose of the current research was to examine proximate associations between real-life cues of morbidity-mortality or unpredictability and parental distress. To remain consistent with prior studies on the proximate effects of unpredictability (e.g., Griskevicius et al., 2013), we focused on economic unpredictability (e.g., changes in finances or occupational status). In Study 1, we examined the unique associations between recent exposure to morbidity-mortality or economic unpredictability and parental stress in a cross-sectional sample of parents who had young children. We also examined whether these associations are moderated by gender and mediated by unpredictability beliefs, and whether they extend to less positive parenting. In Study 2, we sought to replicate the gender-moderated associations of morbidity-mortality and economic unpredictability with parental distress (parental stress and postpartum depression) in a sample of families undergoing the transition to parenthood. We also examined the mediating role of parental self-efficacy.

Study 1

The aim of Study 1 was to determine whether exposure to cues of morbidity-mortality and economic unpredictability in one’s recent environment is associated with greater parental stress. According to LHT, individuals, especially males, should shift their reproductive strategy to focus more on mating and less on parenting when faced with morbidity-mortality or unpredictability cues. This psychological shift should result in parents, especially males, feeling more strained by their parenting duties and experiencing more negative feelings related to their roles as parents (i.e., experience greater parental stress). Our first hypothesis, therefore, was: (H1) Parents, especially men, who were exposed to morbidity-mortality or economic unpredictability in their recent past (prior 6 months) should report greater parental stress.

We also examined whether economic unpredictability and morbidity-mortality operate by increasing unpredictability beliefs (i.e., pervasive beliefs about the stability and dependability of the world and the people in it; Ross & Hill, 2002). Unpredictability and morbidity-mortality both introduce uncertainty about the future. Our second hypothesis, therefore, was: (H2) The effects of economic unpredictability and morbidity-mortality exposure on parental stress should be mediated by unpredictability beliefs.

Finally, we examined whether the associations of economic unpredictability and morbidity-mortality with parental stress are also reflected in less positive parenting. Our third hypothesis was: (H3) Economic unpredictability and morbidity-mortality exposure should be indirectly associated with less positive parenting through greater parental stress.

Method

Participants

Study 1’s sample included 207 American parents (109 men, 98 women) of preschool children (all under age 6) recruited through Amazon Mturk for a small monetary
compensation. Participants were between 19 and 52 years old and had between 1 and 8 children. Most participants were married (72.9%) or in a relationship (17.4%). In terms of education, 9.7% had a GED or high school diploma, 31.4% had some post-high school education, 38.2% had a 4-year degree or equivalent, and 20.8% had a graduate degree or equivalent.

**Procedure and measures**

After answering screening questions designed to make sure they were parenting a preschool child, participants completed the following measures online:

**Economic unpredictability.** We adapted the current unpredictability measure used in Szepsenwol et al. (2015) to assess economic unpredictability within the past 6 months. Participants indicated, on a scale of 1 (*not at all*) to 4 (*4 times or more*), how frequently they had experienced three events describing economic changes (“My financial situation changed,” “I changed jobs,” “My occupational status changed”). Items were averaged to create an economic unpredictability score ($\alpha = .79$). This score was log-transformed to reduce positive skew.

**Morbidity-mortality.** Participants indicated, on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*), their level of agreement with 6 items asking about their exposure to illness, injury, or death during the past 6 months (e.g., “the lives of people close to me were at-risk due to illness,” “I was dealing with health problems”). Items were averaged to create a morbidity-mortality score ($\alpha = .79$).

**Parental stress.** Participants completed the Parental Stress Scale (PSS; Berry & Jones, 1995), which is an 18-item self-report scale assessing positive (e.g., “I am happy in my role as a parent”) and negative (e.g., “The major source of stress in my life is my child(ren)”) parenting experiences. Participants rated their agreement with each item on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). A total parental stress score was created by reversing the positive items and then averaging all items ($\alpha = .90$).

**Unpredictability beliefs.** Participants completed the Scale of Unpredictability Beliefs (SUB; Ross et al., 2016), which is a 15-item self-report scale assessing perceptions of unpredictability in one’s life, in other people, and in the world (e.g., “My life is filled with chaos,” “People are basically undependable,” “The world seems unstable”). Participants rated their agreement with each item on a scale of 1 (*strongly disagree*) to 6 (*strongly agree*). A total unpredictability beliefs score was created by averaging all items ($\alpha = .86$).

**Positive parenting.** Participants rated their agreement, on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*), with 10 items used in prior research (Szepsenwol et al., 2015). Five items assessed their emotional connection with their child (e.g., “I can recall many moments of caring and tenderness with my child”) and five assessed their parental investment and involvement (e.g., “I invest heavily in my child”). Scores for positive...
emotional connectedness and parental investment/involvement were created by averaging the relevant items ($\alpha = .91$ & .81, respectively). A list of all items can be found in the supplemental materials.

**Power analysis**

Simulation tests indicated that 116 to 182 participants are necessary to have at least 90% power to detect moderation that fully offsets a predictor variable effect (Shieh, 2009). Considering gender-specific simple effects, power analysis conducted via G*Power version 3.1 (Faul et al., 2009) indicated that 82 participants are necessary to have 80% power to detect a partial correlation of .30 ($f^2 = .10$) in men or women. Moreover, simulation tests reported by Fritz and MacKinnon (2007) indicated that 71 to 148 participants are necessary to have 80% power to detect mediation if the key paths are between .26 and .39. Our sample, therefore, was adequately powered to detect medium moderation or mediation effects.

**Results and discussion**

**Preliminary analysis and analytic strategy**

Descriptive statistics and correlations between all study variables are displayed in Table 1. Further analyses were conducted in three stages. First, we conducted a hierarchical linear regression examining the unique effects of economic unpredictability and morbidity-mortality exposure on parental stress, along with possible gender moderation. Second, we performed a moderated mediation analysis to determine whether these effects are mediated by unpredictability beliefs. In this analysis, gender moderation was specified for all paths except those leading to unpredictability beliefs. Third, we
performed a moderated mediation analysis to determine whether economic unpredictability and morbidity-mortality exposure are indirectly associated through greater parental stress with less positive parenting (a latent variable whose indicators are parental emotional connectedness and investment/involvement; both loadings above .90). Gender moderation was specified for all paths except the path leading from parental stress to positive parenting (for diagrams of both moderated mediation models, see supplemental materials). These models were estimated using Mplus version 8.3 (Muthén & Muthén, 1998–2019). Conditional and indirect effects were tested using 95% bootstrap confidence intervals. In all analyses, we controlled for the age of the parent and the number of children, given that these variables might be related to the amount of parental stress experienced by each parent. Excluding these covariates did not change the results.

**Economic unpredictability, morbidity-mortality, and parental stress**

We conducted a two-step hierarchical linear regression predicting parental stress. Participants’ age, gender (men = 1, women = −1), number of children, economic unpredictability (standardized), and morbidity-mortality exposure (standardized) were entered in Step 1. The interaction terms of gender × economic unpredictability and gender × morbidity-mortality were entered in Step 2. The results are presented in Table 2. Consistent with H1, both economic unpredictability and morbidity-mortality were uniquely associated with parental stress, explaining together 8.4% of its variance. The effect of economic unpredictability, however, was moderated by gender. Consistent with H1, men’s parental stress was strongly related to how much economic unpredictability they experienced within the past 6 months ($\beta = .36, p < .001, \text{CI} [.18, .55]$), whereas women’s parental stress was not ($\beta = -.01, p = .91, \text{CI} [-.22, .20]$). Contrary to H1, the effect of morbidity-mortality exposure on parental stress was not moderated by gender.

**The mediating role of unpredictability beliefs**

As expected, both economic unpredictability and morbidity-mortality exposure were uniquely associated with having stronger unpredictability beliefs ($\beta = .19, p = .015, \text{CI}$
Having stronger unpredictability beliefs, in turn, was associated with experiencing greater parental stress ($\beta = .31$, $p < .001$, CI $[.17, .44]$). This effect, however, was moderated by gender ($\beta = .14$, $p = .047$, CI $[.00, .27]$). While men who had stronger unpredictability beliefs experienced significantly greater parental stress ($\beta = .44$, CI $[.23, .66]$), this relation was weaker and nonsignificant in women ($\beta = .17$, CI $[-.00, .34]$). Consequently, the indirect paths from economic unpredictability and morbidity-mortality through unpredictability beliefs to parental stress were stronger in men ($\beta = .08$, CI $[.02, .18]$ & $\beta = .09$, CI $[.02, .18]$) than in women ($\beta = .03$, CI $[.00, .09]$ & $\beta = .03$, CI $[.00, .10]$, respectively).

The direct effects of economic unpredictability and morbidity-mortality on parental stress were nonsignificant. The direct effect of economic unpredictability, however, was moderated by gender ($\beta = .15$, $p = .029$, CI $[.02, .28]$). Economic unpredictability was directly associated with parental stress in men ($\beta = .26$, CI $[.07, .43]$), but not in women ($\beta = -.04$, CI $[-.23, .15]$). For men, therefore, the results indicated that unpredictability beliefs partially mediate the link between economic unpredictability and parental stress, and fully mediate the link between morbidity-mortality and parental stress. For women, the results indicated that unpredictability beliefs fully mediate the link between morbidity-mortality and parental stress, and also link economic unpredictability and parental stress indirectly. Altogether, these results are largely consistent with H2 (see supplemental materials for all model coefficients).

**Indirect effects on positive parenting**

As reported earlier, economic unpredictability and morbidity-mortality exposure were uniquely associated with greater parental stress. Parental stress, in turn, was negatively associated with positive parenting ($\beta = -.60$, $p < .001$, CI $[-.71, -.46]$). Consistent with H3, morbidity-mortality exposure was indirectly associated with less positive parenting through greater parental stress ($\beta = -.09$, CI $[-.17, -.01]$). The indirect effect of economic unpredictability on less positive parenting existed in men ($\beta = -.22$, CI $[-.34, -.10]$), but not in women ($\beta = .01$, CI $[-.11, .13]$) (see supplemental materials for all model coefficients).

**Summary and discussion**

LHT proposes that individuals should shift to a reproductive strategy that is more focused on mating and less focused on parenting when the environment is unpredictable or when morbidity-mortality rates are high. On this basis, we proposed that individuals who are already parents should perceive the demands of parenting as more taxing and burdensome and hence experience greater parental stress following recent exposure to economic unpredictability or morbidity-mortality. This hypothesis was supported in Study 1 for both economic unpredictability and morbidity-mortality. Unlike the effect of morbidity-mortality, however, the effect of economic unpredictability emerged only for men. This is consistent with recent evidence that men’s—but not women’s—parental orientations and behaviors are predicted by the amount of unpredictability they
encountered early in their lives (Szepsenwol et al., 2015). Thus, in addition to impacting the development of trait-like parenting orientations, unpredictability also appears to exert proximate effects on men’s parenting experiences.

The first moderated mediation analysis provides a clue as to how life events signaling unpredictability or morbidity-mortality may influence parenting experiences. Parents who were recently exposed to economic unpredictability or morbidity-mortality were more likely to endorse unpredictability beliefs, indicating that these events were perceived as increasing the unpredictability of one’s life and introducing uncertainty about the future. Unpredictability beliefs also partly mediated the link between economic unpredictability and morbidity-mortality exposure and parental stress, especially in men. This finding suggests that parental stress experienced in the context of economic unpredictability or morbidity-mortality is not merely a reflection of the general distress caused by these events; rather, it has a distinct cognitive substrate tied to the unpredictability signaled by them. This cognitive substrate is consistent with the specialized process suggested by LHT, namely, that unpredictability and morbidity-mortality decrease the ability of individuals to predict the outcomes of long-term behavioral investments such as parenting, making these investments riskier and less adaptive.

The second moderated mediation analysis demonstrated how life events signaling unpredictability or morbidity-mortality may indirectly impair parenting by increasing parental stress. These findings highlight the relevance of parental stress as a mechanism through which external stressors can influence the quality of parenting (e.g., Conger et al., 2002).

One limitation of Study 1 is that it did not assess exposure to stressors other than economic unpredictability and morbidity-mortality. It might be that our findings, mainly the gender moderation, are not specific to economic unpredictability and morbidity-mortality, and could be found for other stressors as well. Another limitation of Study 1 is that it used a sample of individual parents rather than parenting dyads. Parenting often takes place within a family unit consisting of two spouses/partners who parent together. Exposure to economic unpredictability or morbidity-mortality is often shared between them, given that spouses/partners normally share their finances and some of their social networks. If one spouse/partner loses a job or has a family member who suffers from a serious illness, both spouses/partners are usually affected. Moreover, distress felt by one spouse/partner can cross-over to affect the other spouse/partner (Repetti & Wang, 2017). We addressed these limitations in Study 2.

**Study 2**

The first aim of Study 2 was to replicate and extend the main findings of Study 1 using a dyadic sample of spouses transitioning into parenthood with their first child. Participants’ parental distress was assessed when the child was approximately 6-months old. This sample offered several advantages. First, it allowed us to examine associations with morbidity-mortality and economic unpredictability during a critical time when spouses were adjusting to their new roles as parents. Second, it allowed us to examine these effects on both spouses simultaneously. Third, due to the proximity of the assessment to the birth of the child, we were able to include postpartum depression as an additional
measure of parental distress. Fourth, it allowed us to examine the specificity of unpredictability and morbidity-mortality effects by controlling for exposure to other stressful life events. Finally, it allowed us to control for psychopathology assessed before the child was born and before life events signaling economic unpredictability and morbidity-mortality had occurred. Preexisting psychopathology could pose an alternative explanation for why some parents are more prone to experience parental distress and have more unpredictability and morbidity-mortality in their lives. We hypothesized that: (H4) Parents, especially men, who experienced economic unpredictability or morbidity-mortality in the 6 months following the birth of their child should report greater parental distress (postpartum depression, parental stress).

The second aim of Study 2 was to examine whether the associations of morbidity-mortality and economic unpredictability with parental distress are mediated by lower parental self-efficacy. If the effects on parental distress are a result of parents feeling less able to cope with the demands of parenting when unpredictability or morbidity-mortality are high, then these associations should be mediated by parents feeling less competent. Hence, we hypothesized that: (H5) The effects of economic unpredictability and morbidity-mortality exposure on parental distress should be mediated by lower parental self-efficacy.

Method

Participants

Study 2’s sample included 105 community-based Israeli families who participated in a longitudinal study of co-living heterosexual couples, all of whom were expecting their first child (55 boys and 50 girls). Families were recruited when mothers were in their third trimester ($M = 29.7$ weeks, $SD = 2.55$). Parents’ ages ranged from 23 to 42 ($M = 30.82$, $SD = 3.63$ for women, $M = 32.41$, $SD = 4.01$ for men). Prospective parents were middle- to upper-class and college educated, on average (years of education: $M = 16.30$, $SD = 2.10$ for women; $M = 15.36$, $SD = 2.41$ for men). Families were compensated for their participation.

Procedure and measures

General psychopathology was assessed at the first phase of the longitudinal study, which took place when mothers were in their third trimester. All other measures were completed when the babies were approximately 6 months old.

Economic unpredictability. Exposure to economic unpredictability was indexed by parents’ exposure, since the birth of the baby, to three types of events on the Life Experiences Survey (LES; Sarason et al., 1978): (1) “major change in work status (e.g., losing a job, starting a new job),” (2) “major change in the spouse’s work status,” and (3) “major change in financial situation.” Each parent indicated whether he or she had experienced each event and rated its impact on his/her life on a scale ranging from $-3$ (extremely negative) to $+3$ (extremely positive). Following prior research (e.g., Östberg & Hagekull,
2000), an economic unpredictability score was created for each parent by summing the negative influence ratings and multiplying each one by $-1$. Parents who did not experience any of these events received a score of 0. Thus, scores could range from 0 (no exposure) to 9 (extremely negative exposure). Men’s and women’s economic unpredictability scores were positively correlated ($r = .38, p < .001$), so they were averaged to create a family-level economic unpredictability score. Scores were log-transformed to reduce positive skew.

**Morbidity-mortality.** Exposure to morbidity or mortality was indexed by parents’ exposure, since the birth of the baby, to three types of events on the LES: (1) “serious illness or injury of a family member or close friend,” (2) “death of a family member or close friend,” and (3) “serious illness or injury to oneself.” Men’s and women’s morbidity-mortality scores were created in the same way as the economic unpredictability scores. These scores were positively correlated ($r = .46, p < .001$), so they were averaged and log-transformed to create a family-level morbidity-mortality exposure score.

**General stressors.** Exposure to general stressors was indexed by parents’ exposure, since the birth of the baby, to stressful life events not signaling economic unpredictability or morbidity-mortality that were included in the LES. These events were: (1) “major change in sleeping habits,” (2) “major change in eating habits,” (3) “sexual difficulties,” (4) “major change in relations with family members,” (5) “major change in the degree of religiosity,” and (6) “major change in the amount or type of leisure activities.” Men’s and women’s general stressors scores were created in the same way as the economic unpredictability and morbidity-mortality scores. These scores were only modestly correlated ($r = .24, p = .018$), so they were log-transformed and kept as individual scores.

**Parental stress.** Stress associated with parenting was assessed via the short-form of the Parenting Stress Index (PSI-SF; Abidin, 1995). Parents rated their agreement with 36 statements on a scale of 1 (strongly disagree) to 5 (strongly agree). Items covered parental distress (e.g., “I feel trapped by my parenting responsibilities”), dysfunctional parent-child interaction (e.g., “My efforts for the child aren’t appreciated”) and negative assessments of the child’s difficulty (e.g., “The child is more of a problem than I expected”). A global parental stress score was computed by averaging all items ($\alpha = .90$ and .92 for men and women, respectively).

**Postpartum depression.** Postpartum depression was assessed using the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987), a 10-item measure assessing depressive symptoms following childbirth (e.g., “I have been so unhappy that I have had difficulty sleeping”). Parents indicated the extent to which each statement corresponded to how they felt during the past week on a 0 to 3 scale. A postpartum depression score was computed by summing all items ($\alpha = .74$ and .83 for men and women, respectively).

**General psychopathology.** General psychopathology was assessed with the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 2009), a 53-item self-report measure that indexes nine types of symptoms: somatization, obsessive-compulsive, interpersonal
sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Parents indicated the extent to which each item corresponded to how they felt during the past week on a 0 to 4 scale. A global psychopathology severity index was computed by summing all items ($\alpha = .96$ for both men and women).

**Parental self-efficacy.** Parental self-efficacy was assessed by the Parenting Sense of Competence Scale (PSOC; Johnston & Mash, 1989), a 16-item measure that assess two related constructs: parenting efficacy and parenting satisfaction. We used the 7-item efficacy subscale, which assesses parents’ perceived competence in their parenting role (e.g., “I meet my own personal expectations for expertise in caring for my child”). Parents rated their level of agreement with each item on a 1 (strongly disagree) to 6 (strongly agree) scale. A parental self-efficacy score was computed by averaging the items ($\alpha = .84$ and .79 for men and women, respectively).

**Power analysis**

Power analysis conducted via G*Power 3.1 indicated that 54 participants are required to have 80% power to detect a medium effect ($f^2 = .15$) and 82 participants are required to have 80% power to detect a partial correlation of .30 ($f^2 = .10$). Simulation tests reported by Fritz and MacKinnon (2007) indicated that 71 to 148 participants are necessary to have 80% power to detect mediation if the key paths are between .26 and .39.

**Results and discussion**

**Preliminary analysis and analytic strategy**

Descriptive statistics and correlations between all study variables are displayed in Table 3. As expected, postpartum depression and parental stress (our two measures of parental distress) were highly correlated for men and women. Therefore, we treated them as two indicators of a latent parental distress variable for men and women (the loadings ranged from .63 to .86). We proceeded by examining the unique effects of family-level economic unpredictability and morbidity-mortality exposure on men’s and women’s parental distress, above and beyond their general psychopathology and exposure to general stressors. Then, we examined whether these effects are mediated by parental self-efficacy (see figure in supplemental materials). The models were estimated using Mplus version 8.3 (Muthén & Muthén, 1998–2019). Indirect effects were tested using 95% bootstrap confidence intervals. Because the dataset contained small amounts of missing data, we used FIML estimation.

**Economic unpredictability, morbidity-mortality, and parental distress**

Consistent with H4, both economic unpredictability and morbidity-mortality were uniquely associated with men’s, but not women’s, parental distress (see Table 4). Together, these two variables explained 8.1% of the variance in men’s parental distress. We examined gender moderation by placing equality constraints on the model. Model fit decreased significantly when paths from morbidity-mortality to parental distress were
constrained to be equal for men and women ($\chi^2(1) = 7.80, p = .005$), and just missed significance when a similar equality constraint was applied to the economic unpredictability paths ($\chi^2(1) = 3.70, p = .054$). Model fit also decreased significantly when both types of paths were constrained simultaneously ($\chi^2(2) = 11.31, p < .001$). Men’s and women’s parental distress was also associated with their existing psychopathology and exposure to general stressors. Interestingly, the path from general stressors to parental distress was stronger for women ($\chi^2(1) = 7.14, p = .008$). These results suggest that men are more likely to experience parental distress when exposed to economic unpredictability and/or morbidity-mortality, whereas women are more likely to experience parental distress when facing general stressful life events.

### Table 3. Descriptive statistics and correlations between study variables (Study 2).

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>M-M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>EPDS</td>
<td>.24*</td>
<td>.28**</td>
</tr>
<tr>
<td>PSI</td>
<td>.25*</td>
<td>.27***</td>
</tr>
<tr>
<td>BSI</td>
<td>.02</td>
<td>.07</td>
</tr>
<tr>
<td>GS</td>
<td>.15</td>
<td>.28***</td>
</tr>
<tr>
<td>PSE</td>
<td>-.22*</td>
<td>-.12</td>
</tr>
</tbody>
</table>

**Note.** M-M = morbidity-mortality; Eco = economic unpredictability; EPDS = postpartum depression; PSI = parental stress; BSI = psychopathology; GS = general stressors; PSE = parental self-efficacy.

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

### Table 4. Standardized full information maximum likelihood coefficients and confidence intervals for structural equation model predicting parental distress.

<table>
<thead>
<tr>
<th></th>
<th>Parental distress (M)</th>
<th>Parental distress (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$SE$</td>
</tr>
<tr>
<td>BSI (M)</td>
<td>.73</td>
<td>.08</td>
</tr>
<tr>
<td>BSI (W)</td>
<td>-.12</td>
<td>.09</td>
</tr>
<tr>
<td>General Stressors (M)</td>
<td>.21</td>
<td>.09</td>
</tr>
<tr>
<td>General Stressors (W)</td>
<td>.14</td>
<td>.09</td>
</tr>
<tr>
<td>Economic Unpredictability</td>
<td>.21</td>
<td>.09</td>
</tr>
<tr>
<td>Mortality-morbidity</td>
<td>.22</td>
<td>.09</td>
</tr>
</tbody>
</table>

**Note.** (M) = men’s score; (W) = women’s score; BSI = psychopathology. Model fit: $\chi^2(13) = 19.57, p = .11$, CFI = .96, RMSEA = .07, SRMR = .04. Men’s parental distress $R^2 = .82$. Women’s parental distress $R^2 = .57$. *** $p < .001$. 
The mediating role of parental self-efficacy

Consistent with H5, exposure to morbidity-mortality was associated with lower parental self-efficacy in men ($\beta = -.23, p = .022, CI [-.43, -.03]$), which, in turn, was associated with greater parental distress in men ($\beta = -.21, p = .023, CI [-.39, -.03]$). The indirect effect from morbidity-mortality to men’s parental distress was significant ($\beta = .05, CI [.01, .15]$), but so was the direct effect ($\beta = .18, p = .034, CI [.01, .35]$), indicating partial mediation. Contrary to H5, greater economic unpredictability was not associated with lower parental self-efficacy in men, precluding mediation. Exposure to general stressors was also not associated with men’s parental self-efficacy.

Exposure to morbidity-mortality, economic unpredictability, or general stressors were not associated with women’s parental self-efficacy. Women’s lower parental self-efficacy, however, was associated with their own greater parental distress ($\beta = -.30, p = .003, CI [-.49, -.10]$). Interestingly, lower parental self-efficacy in men was also associated with greater parental distress in women ($\beta = -.23, p = .025, CI [-.43, -.03]$), creating an indirect path from morbidity-mortality exposure to women’s parental distress through men’s lower self-efficacy ($\beta = .05, CI [.000, .16]$) (see supplemental materials for all model coefficients).

Summary and discussion

During the transition to parenthood, couples often experience changes in well-being as they try to negotiate a new balance, not only between work and family, but also between their spousal and parental roles (Cowan & Cowan, 2000). Study 2 showed that the parental well-being of men going through the transition is particularly vulnerable to events that signal economic unpredictability or morbidity-mortality. Women, in contrast, demonstrated resilience to the same events that had impacted their spouses, while at the same time displaying greater vulnerability to stressful events that do not signal unpredictability or morbidity-mortality.

This context-dependent resiliency among women is particularly striking in light of the fact that the measures of economic unpredictability and morbidity-mortality exposure in Study 2 did not merely reflect their frequency (as in Study 1), but also their emotional impact (i.e., how distressing they were). Still, these distressing events had no direct impact on new mothers’ level of parental distress. This is a critical point where LHT differs from other prevailing frameworks for understanding how extrinsic stress impacts the family, which often describe transfers of negative affect between different settings as spillover effects (Repetti & Wang, 2017). This description is somewhat undercut by the gender moderation found in Study 2. Our findings suggest that the content of the stressor and the gender of the parent both matter in determining whether negative affect will actually spill over into the parenting domain. Specifically, distress elicited by unpredictability or morbidity-mortality readily spills over into men’s parental experience, but not women’s.

Men’s vulnerability to morbidity-mortality also extended to another aspect of their parenting experience—their parental self-efficacy. The involvement of both cognitive and affective aspects of men’s parenting is consistent with the idea that men’s response
to morbidity-mortality should entail a general psychological shift that encompasses cognitions, attitudes, motivations, emotions, and behaviors related to parenting (Szepsenwol et al., 2015). The partial mediation through parental self-efficacy of the effect of morbidity-mortality on men’s parental distress suggests that this effect involves a process specific to parenting. Interestingly, this process may also culminate in greater parental distress in women, as evident in the indirect effect of morbidity-mortality on women’s parental distress through men’s self-efficacy. Because we did not anticipate this finding, it should be interpreted with caution. It is noteworthy, however, that morbidity-mortality exposure was also associated with women’s parental distress in Study 1. The indirect path found in Study 2 suggests that women’s apparent vulnerability to morbidity-mortality is, in fact, mediated by their spouses’ responses to such events, a possibility that could not be explored in Study 1.

General discussion

During their lives, all people experience the death or illnesses of someone close to them, and many also experience periods of economic uncertainty. Throughout evolutionary history, these events served as reliable cues of actual rates of morbidity-mortality and unpredictability in the local environment (Ellis et al., 2009). In the current research, we examined the associations between real-life exposure to cues of morbidity-mortality or unpredictability and parental distress. Given that the adaptive value of parenting is lower in environments high in morbidity-mortality and unpredictability, we hypothesized that parents—especially men—should experience elevated parental distress following recent exposure to these cues.

Indeed, men’s parental distress was higher following recent exposure to morbidity-mortality and economic unpredictability in both studies. Men also reported lower parental self-efficacy following exposure to morbidity-mortality in Study 2. Consistent with LHT, women were more resilient to such events, with the only significant association involving morbidity-mortality emerging in Study 1. Similar to prior research (Szepsenwol et al., 2015), these findings suggest that male parenting is more sensitive to risky and unpredictable environments than female parenting. According to LHT, one primary reason for this is that ancestral men, compared to ancestral women, could more effectively increase their fertility by investing more in mating instead of parenting in risky and unpredictable environments.

The unpredictability schema

Ross and Hill (2002) proposed that experiencing unpredictable environments during childhood should lead to the development of an unpredictability schema—a pervasive belief that the world is chaotic and people are undependable. The results of Study 1 indicate that such beliefs become more salient following recent exposure to either economic unpredictability or morbidity-mortality, and may result in greater parental stress in men. Unpredictability beliefs are not only important to parents’ own experiences, however. Recent research has shown that mothers’ low parental involvement is tied to their children’s unpredictability schemas (Cabeza de Baca et al., 2016). Thus, an
intergenerational transmission mechanism might exist whereby unpredictability cues experienced by parents become internalized as unpredictability schemas. These schemas might then impact parents’ (mainly fathers’) parental cognitions and behavior, which instill unpredictability schemas in their children and eventually affect how children parent when they themselves become parents. This intergenerational mechanism should be investigated in future research, which should account for parents’ childhood experiences and the parenting they received.

**Limitations and future directions**

The results of this research should be interpreted in the context of several limitations. First, exposure to morbidity-mortality and economic unpredictability was measured rather than experimentally manipulated. Although it is unlikely that parental distress affected the occurrence of external events that are unpredictable by nature, we cannot preclude the possibility that these associations were driven by some confound of economic unpredictability or morbidity-mortality. Relatedly, although we controlled for prenatal general psychopathology in Study 2, we did not have a specific prenatal analog of parental distress that could serve as a control for preexisting distress. Nor did we control for genetic influences.

Second, we could not determine the temporal sequence between unpredictability beliefs or parental self-efficacy and parental distress. It is possible, for example, that the greater distress felt by parents fed their unpredictability beliefs or their lower feelings of self-efficacy, making them feel more helpless and less in control. Future research should elucidate the temporal relations between these variables.

Third, our samples included parents from Western industrialized countries, most (Study 1) or all (Study 2) of whom were married. Our findings may not generalize to parents who are in cultural or personal situations that allow them to set aside their parenting duties more easily when parenting becomes more burdensome, thereby avoiding the resulting distress.

Finally, our focus was on unpredictability of an economic nature. The transition to parenthood often involves changes in the family’s financial situation (Cowan & Cowan, 2000). Nevertheless, other sources of unpredictability may also exist in parents’ lives, such as residential changes and family transitions (Belsky et al., 2012; Simpson et al., 2012). Future research, therefore, should examine the relation between other sources of unpredictability and parental distress.

**Conclusion**

Life history theory (LHT) provides a powerful theoretical framework for understanding the environmental determinants of parental cognitions, emotions, and behaviors. In the current research, we found that men’s parental distress is higher following recent exposure to real-life cues of morbidity-mortality or economic unpredictability, environmental characteristics that should reduce the adaptive value of parental investment, especially in men. In addition to shedding light on the mechanisms through which men adjust their reproductive strategies, these findings can inform future parenting
interventions aimed at reducing stress and depression brought about by the demands of parenthood.

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**Open research statement**
As part of IARR’s encouragement of open research practices, the author has provided the following information: This research was not pre-registered. The data used in the research are available. The data can be obtained by emailing: ohad.sheps@gmail.com. The materials used in the research are available. The materials can be obtained by emailing: ohad.sheps@gmail.com.

**Supplemental material**
Supplemental material for this article is available online.

**Notes**
1. Correlations between the three subscales of the scale are given in the supplemental materials.
2. Similar results were obtained when we controlled only for depression and anxiety, instead of general psychopathology (see supplemental materials).

**References**


