

# The Effects of Paternal Disengagement on Women's Sexual Decision Making: An Experimental Approach

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An abundance of research demonstrates a robust association between father absence—or low-quality paternal involvement—and daughters' accelerated sexual development, promiscuity, and sexual risk taking. Although recent natural experiments provide support for fathers playing a causal role in these outcomes, these effects have not been examined using a randomized experimental design to eliminate genetic and environmental confounds inherent in previous studies. We redressed this empirical gap by experimentally testing the effects of primed paternal disengagement cues on women's sexual decision making. Across 5 experiments, reminders of paternal disengagement increased women's activation of sexual thoughts (Experiment 1), sexual permissiveness (Experiments 2–4), and negativity toward condom use (Experiment 5). Moreover, these effects were specific to women's sexual decision making, as paternal disengagement cues failed to influence women's willingness to take nonsexual risks (Experiment 4) or men's risky sexual attitudes (Experiment 5). These results provide the first true experimental evidence supporting a causal relationship between paternal disengagement and changes in women's psychology that promote risky sexual behavior.

*Keywords:* father absence, paternal investment theory, paternal disengagement, sexual permissiveness, sexual risk

Frayser High School in Memphis, Tennessee, made national headlines in January of 2011 when it was revealed that approximately one in five female students attending the school was pregnant or had recently given birth (e.g., Mandell, 2011). Although critics were quick to blame this surge in teen pregnancy on popular media influence—including television shows such as MTV's *Teen Mom* and *16 and Pregnant*—this seemingly isolated incident may actually be symptomatic of more deeply rooted issues confronting Tennessee residents in recent years. In addition to high rates of teen pregnancy, Tennessee has one of the highest rates of sexually transmitted infection (STI) in the nation (Guttmacher Institute, 2010; U.S. Centers for Disease Control and Prevention, 2011). Additionally, Tennessee is home to a growing number of single-parent households, with nearly one in four families being headed by single mothers (U.S. Census Bureau, 2009).

Although the above-average rates of teenage pregnancy, STI risk, and divorce confronting Tennessee residents may appear to be largely distinct social concerns, a growing body of research suggests that these issues may be intimately related. For several decades and across numerous samples, researchers have revealed a

robust association between father absence—both physical and psychological—and accelerated reproductive development and sexual risk taking in daughters (see e.g., Belsky, Steinberg, & Draper, 1991; Draper & Harpending, 1982; Ellis, 2004; Ellis et al., 2003; Ellis, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999; James, Ellis, Schlomer, & Garber, 2012; Mackey & Coney, 2000; Quinlan, 2003). According to paternal investment theory (Draper & Harpending, 1982; Ellis, 2004; Ellis, Schlomer, Tilley, & Butler, 2012), these effects are related to father presence/absence playing a causal role in shaping daughters' sexual strategies. In particular, it is hypothesized that paternal absence and disengagement promote relatively short-term and risky sexual behaviors. Although recent natural experiments have provided initial support for a causal link between these variables, the literature is currently lacking randomized experimental tests of this hypothesis. We redressed this gap by examining the effects of locally activated reminders of paternal disengagement on women's sexual decision making. By combining theory and research from evolutionary, developmental, and experimental social psychology, we sought to establish a causal link between paternal disengagement and daughters' accelerated sexual outcomes.

## Paternal Investment Theory and the Association Between Father Absence and Daughters' Sexual Outcomes

Researchers have frequently observed that paternal investment seems to have a lasting impact on children's well-being in a number of critical domains. For instance, children who grow up with their biological fathers in the home have a reduced risk of illness and a lower rate of infant mortality relative to children from single-parent households (Figueredo et al., 2006; Geary, 2000,

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This article was published Online First May 27, 2013.

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We thank Marissa Clinchy, Julia Edwards, Ruth Lee, Rachel Reyna, Alice Schrubba, Shannon Shiels, John Thomas, Marissa Torres, and Kaye-Marie Zani for their research assistance with this project.

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2005; Hill & Hurtado, 1996; Schmeer, 2009; Schultz, 1991). Paternal investment is also associated with greater academic achievement in childhood, higher socioeconomic status (SES) in adulthood, and increased upward social mobility (Amato, 1998; DeBell, 2008; Geary, 2005; Kaplan, Lancaster, & Anderson, 1998; Kaplan, Lancaster, Bock, & Johnson, 1995; Mulkey, Crain, & Harrington, 1992). Although researchers have established a link between paternal involvement and desirable outcomes for both sons and daughters, much of the relevant literature highlights the reliable and pronounced association between father absence and daughters' accelerated developmental, sexual, and reproductive outcomes (e.g., Ellis et al., 1999, 2003; James et al., 2012; Quinlan, 2003).

Why might fathers play such an important role in shaping daughters' sexual and reproductive development? To help answer this question, Draper and Harpending (1982) proposed a landmark theory linking paternal investment availability and girls' sociosexual outcomes (i.e., paternal investment theory). According to paternal investment theory (PIT; Draper & Harpending, 1982; Ellis, 2004; Ellis et al., 2003, 2012), girls are uniquely sensitive to the availability and quality of investment they receive from their biological fathers because these cues provide important diagnostic information regarding the structure and character of the local mating system (e.g., Del Giudice & Belsky, 2011; Draper & Harpending, 1982; Ellis et al., 1999, 2003, 2012; James et al., 2012). In particular, father absence—or low-quality paternal care—is hypothesized to signal that long-term male investment in offspring production is unreliable or unnecessary in the current ecology. Daughters are reasoned to use these cues to adjust their reproductive strategies in ways that maximize fitness in such contexts. Specifically, father absence is expected to shift girls toward faster reproductive strategies characterized by precocious sexual development, earlier sexual activity, and younger age at first reproduction (Belsky et al., 1991; Draper & Harpending, 1982; Ellis et al., 1999; Figueredo et al., 2006). These changes are predicted to occur because women would not benefit from delaying reproductive activities to search for a high-investing mate in environments where male parental care is scarce.

PIT has served as the foundation for related evolutionary developmental theories on environmental stress, including psychosocial acceleration theory (Belsky et al., 1991). According to this theory, ecological conditions and family dynamics help shape children's early attachment patterns and subsequent pubertal and reproductive timing to adaptively match individuals to their environments. On this view, individuals growing up in harsh or unpredictable family environments reliably benefit from accelerating physical maturation and engaging in behaviors consistent with a fast life history strategy (i.e., early sex and reproduction, risky sexual behavior, investment in offspring quantity over quality). A shortened reproductive timetable is reasoned to be evolutionarily adaptive in such a context because it helps ensure that individuals will have an opportunity to reproduce before perishing if conditions remain harsh or worsen (e.g., Brumbach, Figueredo, & Ellis, 2009; Stearns, 1992).

Although psychosocial acceleration theory shares some of the core assumptions of PIT, these theories differ regarding the emphasis on fathers and their effects on daughters' sociosexual outcomes. Specifically, PIT posits a unique and specific role for father presence/absence and paternal involvement in the regulation of

daughters' sexual development. This perspective stands in contrast to psychosocial acceleration theory, which is agnostic regarding any special role for fathers separate from more general effects of parenting or socioecological stress. Psychosocial acceleration theory also does not predict sex-differentiated developmental outcomes for sons versus daughters.

Numerous empirical investigations provide support for specific predictions borne from PIT. For example, research demonstrates that girls growing up in father-absent homes—or in homes characterized by low-quality paternal investment—experience accelerated pubertal development, initiate sexual intercourse and become pregnant earlier, have a greater number of sexual partners, and are more likely to get divorced relative to girls growing up in households with two investing parents (Coley, Votruba-Drzal, & Schindler, 2009; Ellis & Essex, 2007; Ellis et al., 1999, 2003, 2012; James et al., 2012; Moffitt, Caspi, Belsky, & Silva, 1992; Quinlan, 2003; Rowe, 2000; Shavelsky, 2008). These outcomes are especially pronounced when the onset of the absence occurs at a relatively young age and the duration of absence is prolonged (e.g., D'Onofrio et al., 2006; Ellis et al., 2003; Moffitt et al., 1992; Quinlan, 2003; Vigil & Geary, 2006). Further, these effects extend above and beyond the effects of maternal care (e.g., Manlove, Wildsmith, Ikramullah, Terry-Humen, & Schelar, 2012; Regnerus & Luchies, 2006; Rink, Tricker, & Harvey, 2007), indicating that the role of parental involvement in daughters' sociosexual development may be especially pronounced for fathers.

A growing body of research also supports the prediction that the influence of paternal investment is more pronounced for daughters and is specific to sociosexual risk (Ellis et al., 2012). For example, researchers have found that the effects of paternal investment on sexual risk taking is stronger for daughters than for sons (e.g., Coley et al., 2009; Davis & Friel, 2001; James et al., 2012). Others have found that paternal investment more strongly predicts daughters' sexual risk taking than their *nonsexual* risk taking (e.g., violent behavior; Ellis et al., 2003). Taken together, previous findings suggest that both the quality and duration of investment received by girls from their biological father may provide important cues about the availability of male investment that daughters use to adjust their sexual and reproductive strategies throughout development.

### Examining the Causal Impact of Paternal Investment on Daughters' Sexual Strategies

Despite substantial empirical support for specific predictions derived from PIT, there is still debate regarding the extent to which a causal relationship exists between paternal investment and daughters' sexual and reproductive outcomes. The largely correlational nature of previous cross-sectional and longitudinal investigations has led some researchers to posit that the associations can be accounted for by genetic and environmental confounds inherent in these designs (e.g., Comings, Muhleman, Johnson, & MacMurray, 2002; Dunne et al., 1997; Mendle et al., 2009; Rodgers, Rowe, & Buster, 1999; Rowe, 2000, 2002). For example, it is possible that the men who are most likely to become absent fathers may also pass on genes that predispose their daughters to relatively rapid sexual maturation and greater promiscuity (e.g., Comings et al., 2002; Figueredo et al., 2006). Others have noted that shared environmental factors, such as race or SES, might independently

impact both paternal investment levels and daughters' developmental and sexual outcomes. For instance, poverty—which is independently associated with higher rates of absent fathers (e.g., Figueredo et al., 2006) and increased sexual risk taking (e.g., Chandy, Harris, Blu, & Resnick, 1994)—has been suggested to alone account for the association between father absence and daughters' sexual risk observed in previous research (e.g., James et al., 2012; Quinlan, 2003).

Researchers have taken important analytical and methodological steps to help rule out these alternative explanations. For instance, studies have shown that the association between father absence and daughters' sexual outcomes persists after statistically controlling for potential environmental (e.g., family income, race, family stress) and genetic (e.g., mother's age at menarche and first birth) confounds (e.g., Chandy et al., 1994; Coley et al., 2009; Ellis et al., 2003). The effects of father absence and low-quality paternal investment on daughters' development and sexual risk taking have also been demonstrated using natural experimental methods, including children-of-twin and differential sibling-exposure designs (D'Onofrio et al., 2006; Ellis et al., 2012; Tither & Ellis, 2008). Still, one cannot fully examine the precise causal impact of paternal investment on daughters' outcomes without conducting randomized experiments (see e.g., Ellis et al., 1999, 2012; James et al., 2012; Tither & Ellis, 2008). The current studies were thus designed to serve as an important step in redressing this empirical gap, experimentally testing whether a causal relationship exists between locally activated cues to paternal disengagement and changes in women's sexual decision making. Although the ability to examine the established father–daughter effects using randomized experimental methods is limited by various ethical and procedural constraints (e.g., inability to manipulate actual paternal investment or measure changes in women's sexual behavior), the current research was designed to establish whether women's sexual decision making is sensitive to paternal investment cues. Specifically, we sought to explore whether primed reminders of paternal disengagement produce psychological shifts in women that promote risky sexual behavior.

### The Current Research

We conducted five experiments to test our hypothesis. We predicted that priming paternal disengagement (i.e., remembering a time when one's father was physically or psychologically absent from an important life event) would increase women's (a) sexualized thoughts, (b) positivity toward uncommitted sex, (c) desire to have sex with a greater number of partners, and (d) negativity toward condom use. Consistent with PIT, we expected that these effects would be specific to women's sexual outcomes (i.e., they would not be observed among men) and that they would not extend to women's disinhibition or willingness to take risks outside the sexual domain.

#### Experiment 1: The Effect of Paternal Disengagement on Women's Activation of Sexual Thoughts

Previous research demonstrates a reliable association between father absence—or low-quality paternal investment—and early onset of daughters' sexual activity (e.g., Ellis et al., 2003, 2012; James et al., 2012). Experiment 1 was therefore designed to

examine whether reminders of paternal disengagement increase activation of sexualized thoughts—which may facilitate precocious sexual behaviors—among women. To test this possibility, we randomly assigned women to describe a time their father was physically or psychologically absent or present for an important life event. They then completed a word-stem task to allow us to assess cognitive accessibility of sexual concepts (see Miller & Maner, 2011). We predicted that women primed with paternal disengagement cues would complete more word stems in a sexualized way relative to women primed with paternal engagement cues.

### Method

**Participants.** Participants were 75 heterosexual female undergraduates ( $M_{\text{age}} = 18.52$  years,  $SD = 0.95$ ; 37 in the paternal disengagement condition). Ten women (eight in the paternal disengagement condition) were excluded from the final analysis for failing to complete the priming procedure as instructed. All students received partial course credit in exchange for their participation.

This sample consisted largely of White women ( $n = 67$ ) whose biological parents were currently married ( $n = 58$ ). Regarding the race of the remaining participants for whom these data were available, one was Black (zero in the paternal disengagement condition), four were Hispanic (one in the paternal disengagement condition), and two were Asian American (zero in the paternal disengagement condition). Regarding the family composition of the remaining participants for whom these data were available, 11 had parents who were divorced or separated (five in the paternal disengagement condition), and two reported that their mother or father was widowed (zero in the paternal disengagement condition).

**Procedure and materials.** Upon arriving for the study session, students were seated at private computer terminals. All instructions and stimuli were presented via Qualtrics web-based experimental program (Qualtrics, Inc., Provo, UT). Participants were told they would complete a study designed to explore the relationship between individual differences in writing style and the evaluation and interpretation of irrelevant stimuli. First, they answered a series of distractor questions about the frequency with which they read and write various types of information (e.g., “How often do you read information in printed sources?”). Next, all participants were asked to write an objective description of the experiment room in order to bolster the believability of the cover story.

After completing the distractor essay, participants in the *paternal disengagement* condition were asked to remember and write about a time their biological father was physically or psychologically absent for an important life event. Specifically, participants received the following instructions:

Take a few seconds to think back to a time when your biological father was absent for an important life event when you really needed him . . . Describe in detail how your father's lack of support—or his physical or psychological absence—made you feel.

Participants in the *paternal engagement* condition received identical instructions except that they were asked to describe a time their father was physically or psychologically present for an

important life event. A trained research assistant coded the content of the typed responses to ensure that participants followed the instructions for their randomly assigned writing prompt.

Following the priming procedure, participants completed a word-stem task that has been used in previous research to assess the activation of sexual concepts (see Miller & Maner, 2011, for a description). This measure consisted of 14 word stems, including 10 target items that could be completed in a sexualized or a neutral manner (e.g., S\_\_X, \_\_AK\_\_D). The primary dependent measure was the total number of word stems completed in a sexualized way. Finally, participants answered a few demographic questions before being thanked and dismissed.

## Results

A condition-blind female research assistant was trained to code participants' responses to the 10 target word stems. For each item, sexual responses (e.g., SEX, NAKED) were coded as 1 and non-sexual responses (e.g., SIX, BAKED) were coded as 0. Participants' coded responses on these items were then summed to produce a single score (range: 0–10) indicating the total number of word stems completed in a sexualized way. This score was entered as the dependent measure in a one-way (priming condition: paternal disengagement vs. paternal engagement) analysis of variance (ANOVA). The analysis revealed a significant main effect of condition on word stem scores,  $F(1, 73) = 4.51, p = .037, d = 0.49$ . As expected, participants in the paternal disengagement condition completed a greater number of word stems in a sexualized way ( $M = 4.51, SD = 2.06$ ) relative to women in the paternal engagement condition ( $M = 3.63, SD = 1.50$ ).

## Discussion

As predicted, priming reminders of paternal disengagement increased activation of sexualized thoughts among women. Specifically, women who described a time their biological father was physically or psychologically disengaged completed a greater number of ambiguous word stems in a sexualized way relative to women who described a time their father was engaged. This result is consistent with the logic of PIT and the robust body of research demonstrating an association between father absence and daughters' precocious sexual behavior (see, e.g., Ellis et al., 2003; James et al., 2012; Quinlan, 2003).

### Experiment 2: Effects of Paternal Disengagement on Women's Sexual Permissiveness

We designed Experiment 2 to build on the results of our first experiment by examining the effects of locally activated cues to paternal disengagement on women's sexual attitudes. In accordance with previous findings, we predicted that women primed with paternal disengagement would endorse more permissive sexual attitudes compared to women primed with paternal engagement. As in Experiment 1, participants described a time that their biological father was absent (or present) for an important event. After they completed the priming procedure, participants were presented with items measuring their sexual permissiveness. Finally, participants completed the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) to test

whether the results could potentially be accounted for by divergent emotional responses evoked by the writing primes. This alternative explanation was important to address as previous research has revealed an association between strong negative emotional experiences and increased sexual risk taking (Deckman & DeWall, 2011).

## Method

**Participants.** Participants were 64 heterosexual female undergraduates ( $M_{\text{age}} = 18.95$  years,  $SD = 1.21$ ; 29 in the paternal disengagement condition). Twelve women (eight in the paternal disengagement condition) were excluded from the final analyses for failing to complete their assigned writing prompt as instructed. All participants received partial course credit in exchange for their participation. The final sample included primarily White women ( $n = 52$ ) whose biological parents were currently married ( $n = 45$ ). Regarding the race of the remaining participants, one was Black (one in the paternal disengagement condition), nine were Hispanic (four in the paternal disengagement condition), and two were Asian American (one in the paternal disengagement condition). Regarding their family backgrounds, 15 had parents who were divorced or separated (seven in the paternal disengagement condition), one reported having a mother or father who was widowed (one in the paternal disengagement condition), and three had biological parents who were never married (one in the paternal disengagement condition).

**Procedure and materials.** The priming procedure was the same as that used in Experiment 1, with participants describing a time their biological father was absent or present for an important event. Their degree of sexual permissiveness was assessed via their responses to items from the Sociosexual Orientation Inventory (SOI; Simpson & Gangestad, 1991). The SOI is a reliable and valid measure of individual differences in willingness to engage in uncommitted sex that includes both retrospective and prospective items (see, e.g., Schmitt, 2005; Simpson & Gangestad, 1991). Because responses on the retrospective items would not be sensitive to local manipulations (i.e., one cannot change one's sexual history), our measure included only those items that assess current sexual attitudes. These items were (a) "Sex without love is OK," (b) "I can imagine myself being comfortable and enjoying casual sex with different partners," and (c) "I would have to be closely attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him" (reverse coded). Participants were asked to rate their agreement with these items on scales ranging from 1 (*completely disagree*) to 9 (*completely agree*), and higher scores corresponded to more permissive sexual attitudes. Finally, we presented the PANAS (Watson et al., 1988) to assess positive and negative emotional states evoked by the experimental primes.

## Results

First, we computed participants' scores on the PANAS in order to obtain indices of positive ( $\alpha = .89$ ) and negative ( $\alpha = .84$ ) affect. These scores were analyzed in a one-way (priming condition: paternal disengagement vs. paternal engagement) between-subjects multivariate analysis of variance (MANOVA), and the analysis revealed no significant differences in positive or negative

affect between conditions ( $ps \geq .71$ ). Therefore, affect scores were not included as factors in the subsequent analysis.

Next, we created a composite index of sexual permissiveness by averaging the three attitudinal items from the SOI ( $\alpha = .69$ ). We analyzed between-subjects differences on this measure using a one-way (priming condition) between-subjects ANOVA. As predicted, women who described a time that their father was disengaged reported more permissive sexual attitudes ( $M = 2.57$ ,  $SD = 1.88$ ) relative to women who described a time that their father was engaged ( $M = 1.86$ ,  $SD = 0.94$ ),  $F(1, 62) = 3.91$ ,  $p = .052$ ,  $d = 0.48$ .

## Discussion

Upon activation of psychological states associated with paternal disengagement, women expressed more permissive sexual attitudes relative to those women who described a time their father was engaged. This finding is consistent with previous research demonstrating that girls growing up in environments characterized by low-quality paternal investment are generally more sexually active than those growing up with a biological father in the home who provides meaningful investment (e.g., Quinlan, 2003). Further, this finding suggests that the increased sexual promiscuity demonstrated by girls with an absent father may partially derive from increasingly permissive sexual attitudes evoked in response to paternal disengagement cues. Finally, there were no differences in positive or negative affect evoked by the writing primes, suggesting that the results could not be accounted for by heightened levels of negative (or positive) affect evoked by paternal disengagement (or engagement) cues.

### Experiment 3: Can the Effects of Paternal Disengagement on Women's Sexual Permissiveness Be Produced by the Disengagement of Any Close Other?

Experiment 2 demonstrated that activating thoughts associated with paternal disengagement led women to report more permissive sexual attitudes than women primed with paternal engagement. However, given that the experiment compared the attitudes of women primed with paternal disengagement against those primed with paternal engagement, it is possible that paternal engagement cues had a dampening effect on daughters' sexuality rather than paternal disengagement having an augmenting effect. Therefore, we designed Experiment 3 to help rule out this alternative explanation by attempting to conceptually replicate the results of Experiment 2 using a novel comparison condition: *friend disengagement*. Researchers have suggested that individuals transfer close social connections from their parents to friends and romantic partners during young adulthood (see, e.g., Hazan & Shaver, 1994; Simpson & Belsky, 2008). Accordingly, comparing the responses of women primed with father disengagement versus friend disengagement would allow us to more definitively test the effects of fathers on women's sexual decision making. Inclusion of this novel comparison group also diminished the possibility that observed attitudinal shifts are due to more generalized feelings of rejection or disappointment resulting from the disengagement of any close other (see e.g., Hazan & Shaver, 1994; Simpson & Belsky, 2008). Finally, Experiment 3 was designed to test whether locally activated paternal disengagement cues would lead women

to express interest in having sex with a greater number of partners relative to women who describe a disengaged friend.

## Method

**Participants.** Participants were 82 heterosexual female undergraduates ( $M_{\text{age}} = 18.54$  years,  $SD = 1.01$ ; 40 in the paternal disengagement condition). Six women (five in the paternal disengagement condition) were excluded from the final analyses for failing to complete their assigned writing prompt as instructed. All students received partial course credit in exchange for their participation. Participants were primarily White women ( $n = 77$ ) whose biological parents were currently married ( $n = 61$ ). Regarding the race of the remaining participants, three were Hispanic (one in the paternal disengagement condition), and two were Asian American (zero in the paternal disengagement condition). Regarding the family background of the remaining participants for whom these data were available, 15 had parents who were divorced or separated (six in the paternal disengagement condition) and four had biological parents who were never married (zero in the paternal disengagement condition).

**Procedure and materials.** The priming procedure was similar to that used in Experiments 1 and 2, except that instead of describing a time their father was engaged, half of our participants were asked to describe a time that a close friend disappointed them or was absent for an important life event. Following the priming procedure, participants completed the sexual attitudes measure used in Experiment 2. In addition, participants were asked to indicate how many people they currently know with whom they would enjoy having sex (Snyder, Simpson, & Gangestad, 1986). Finally, they completed the PANAS before being thanked and dismissed.

## Results

First, we computed participants' positive ( $\alpha = .87$ ) and negative ( $\alpha = .80$ ) affect scores on the PANAS. These scores were analyzed in a one-way (priming condition: paternal disengagement vs. friend disengagement) between-subjects MANOVA, and the analysis revealed no significant differences in positive or negative affect between conditions ( $ps = .83$ ). These results suggest that any differences observed between conditions cannot be accounted for by differences in affect or arousal evoked in response to the writing primes.

Next, we created a composite index of sexual permissiveness by averaging the three attitudinal items from the SOI ( $\alpha = .71$ ). We analyzed between-subjects differences on this measure and women's desired number of sex partners using a one-way (priming condition) MANOVA. As predicted, women who described a time their father was disengaged reported more permissive sexual attitudes ( $M = 2.90$ ,  $SD = 2.25$ ) relative to women who described a time a close friend was disengaged ( $M = 2.09$ ,  $SD = 1.19$ ),  $F(1, 80) = 4.24$ ,  $p = .043$ ,  $d = 0.45$ . In addition, women who described a time their father was disengaged reported desiring a greater number of sexual partners ( $M = 2.30$ ,  $SD = 3.20$ ) relative to women in the friend disengagement condition ( $M = 1.17$ ,  $SD = 1.31$ ),  $F(1, 80) = 4.50$ ,  $p = .037$ ,  $d = 0.46$ .

## Discussion

Experiment 3 conceptually replicated the results of Experiment 2, demonstrating that activating psychological states associated with paternal disengagement led women to express more permissive sexual attitudes relative to women who were reminded of a friend's disengagement. Experiment 3 also extended these results by demonstrating that paternal disengagement cues increase the number of men with whom women desired to have sex. These findings are consistent with previous research demonstrating that girls growing up in environments characterized by low-quality paternal investment have a greater number of sexual partners relative to girls growing up with a high-quality biological father in the home (e.g., Quinlan, 2003). These results suggest that a permissive shift in daughters' sexual attitudes in response to paternal disengagement cues might accompany this increased promiscuity.

By comparing the relative effects of father versus friend disengagement, the results of Experiment 3 also suggest that the relationship between paternal disengagement and women's increased sexual permissiveness cannot be accounted for by the disengagement of any close other. Close friends are typically an important component of social support systems for individuals during young adulthood (e.g., Hazan & Shaver, 1994; Simpson & Belsky, 2008). Therefore, conceptually replicating our results with this novel comparison group lends further support for the hypothesis that daughters are uniquely sensitive to paternal investment cues—not merely cues to social rejection, more generally—and they use these cues as the basis for adjusting their reproductive strategies throughout development.

### Experiment 4: Relative Effects of Paternal and Maternal Disengagement on Women's Attitudes Toward Sexual and Nonsexual Risk

Experiment 3 demonstrated that activating reminders of paternal disengagement led women to report more permissive sexual attitudes than reminders of friend disengagement. Although researchers have suggested that college-age individuals often transfer social bonds from their parents to close friends (see e.g., Hazan & Shaver, 1994; Simpson & Belsky, 2008), it is possible that paternal disengagement has a stronger emotional effect on women than the disengagement of a friend. For example, a parent's absence may evoke greater feelings of rejection and abandonment than a close friend's absence, which may have contributed to our results. Therefore, we designed Experiment 4 to conceptually replicate the results of Experiment 3 using another novel comparison condition (*maternal disengagement*) to test this possibility. PIT predicts that fathers exert unique effects on daughters' sexual outcomes beyond the more generalized detriment often exhibited by children growing up without a mother (e.g., Draper & Harpending, 1982; Ellis & Essex, 2007; Ellis et al., 1999, 2012; Sear & Mace, 2008; Tither & Ellis, 2008). Accordingly, we predicted that women primed with paternal disengagement cues would report increased sexual permissiveness relative to women who described a time their mother was disengaged.

A second goal of Experiment 4 was to test the specificity of our findings to *sexual* permissiveness and risk. PIT and previous research suggest a targeted effect of father absence on daughters' sexual outcomes that does not extend to other forms of risk taking

and disinhibition (e.g., Coley et al., 2009; Ellis et al., 2003; James et al., 2012). Therefore, we predicted that the effects of primed paternal disengagement cues would be specific to women's sexual permissiveness and would not increase women's willingness to take nonsexual risks or their preference for immediate gratification in nonsexual domains.

## Method

**Participants.** Participants were 62 heterosexual female undergraduates ( $M_{\text{age}} = 18.56$  years,  $SD = 1.17$ ; 33 in the paternal disengagement condition), and they received partial course credit in exchange for their participation. Nine women (four in the paternal disengagement condition) were excluded from the final analyses for failing to complete their assigned writing prompt as instructed. The majority of participants were White ( $n = 48$ ) and had nondivorced biological parents ( $n = 45$ ). Regarding the race of the remaining participants for whom these data were provided, four were Black (one in the paternal disengagement condition), three were Hispanic (one in the paternal disengagement condition), and two were Asian American (one in the paternal disengagement condition). Regarding the family background of the remaining participants for whom these data were available, six had parents who were divorced or separated (two in the paternal disengagement condition), two reported that their mother or father was widowed (one in the paternal disengagement condition), and seven had biological parents who were never married (four in the paternal disengagement condition).

**Procedure and materials.** The priming procedure was similar to that in the previous experiments, except that half of our participants were asked to describe a time that their mother was absent for an important life event. Next, participants completed a sexual attitudes measure similar to that used in Experiments 2 and 3, as well as two measures assessing their attitudes toward nonsexual risk taking. Finally, participants completed the Brief Mood Introspection Scale (Mayer & Gaschke, 1988).

**Sexual permissiveness.** Participants responded to three items assessing their sexual permissiveness (Snyder et al., 1986). These items were (a) "For me, having sex with someone does not necessarily imply that I am committed to that individual," (b) "I would feel comfortable and at ease having sex with someone I was very much attracted to but did not know very well," and (c) "I would not have sex with somebody unless I was totally and exclusively committed to that person first" (reverse coded). Participants were asked to rate their agreement with these items on scales ranging from 1 (*completely disagree*) to 9 (*completely agree*), and higher scores corresponded to more permissive sexual attitudes. Participants were also asked to indicate how many people they foresaw themselves having sex with during the next 5 years (Simpson & Gangestad, 1991).

**Nonsexual risk and desire for immediate (nonsexual) gratification.** To examine participants' more general attitudes toward engaging in risky or disinhibited behaviors, we presented five items from the Risk Taking scale of the Disinhibition Inventory (DIS-I; Dindo, McDade-Montez, Sharma, Watson, & Clark, 2009). Specifically, participants were asked to rate their agreement with the following statements: (a) "I enjoy taking risks," (b) "I seek thrilling experiences," (c) "I like situations that involve danger," (d) "I like to be spontaneous," and (e) "I prefer to do things

that are safe” (reverse coded). Items were presented on 5-point rating scales (anchors: 1 = *strongly disagree*, 5 = *strongly agree*), and higher values represent more positive attitudes toward risk taking.

We also presented items from the Delayed Gratification Inventory (DGI; Hoerger, Quirk, & Weed, 2011) to assess participants’ reported ability to exert self-control in nonsexual domains. Specifically, participants responded to the following six items taken from the Food and Money subscales of the DGI: (a) “I can resist junk food when I want to” (reverse coded), (b) “I would have a hard time sticking to a special, healthy diet,” (c) “If my favorite food were in front of me, I would have a difficult time waiting to eat it,” (d) “It is hard for me to resist buying things I cannot afford,” (e) “When someone gives me money, I prefer to spend it right away,” and (f) “I enjoy spending money the moment I get it.” These items were presented on 5-point rating scales (anchors: 1 = *strongly disagree*, 5 = *strongly agree*), and higher values represented decreased ability to delay gratification.

**Brief Mood Introspection Scale (BMIS).** We presented the BMIS (Mayer & Gaschke, 1988) to test for differing levels of positive and negative affect and arousal evoked by the experimental primes. The BMIS includes 16 adjectives corresponding to four dimensions of affect and arousal (pleasant–unpleasant, arousal–calm, positive–tired, and negative–relaxed). Participants rated the extent to which they were experiencing each of these states on 4-point scales (anchors: 1 = *definitely do not feel*, 4 = *definitely feel*).

## Results

First, to test differences in affect and arousal evoked by the priming procedure, we computed participants’ scores on the four dimensions of the BMIS. These scores were analyzed in a one-way (priming condition: paternal disengagement vs. maternal disengagement) between-subjects MANOVA. The analysis revealed no significant between-conditions differences on the arousal–calm ( $p = .85$ ), negative–relaxed ( $p = .21$ ), pleasant–unpleasant ( $p = .06$ ), or positive–tired ( $p = .07$ ) dimensions of the BMIS. Accordingly, these dimensions were not included as covariates in subsequent analyses.<sup>1</sup>

Next, we created a composite index of sexual permissiveness ( $\alpha = .88$ ), attitudes toward nonsexual risk ( $\alpha = .79$ ), and self-reported ability to delay gratification in nonsexual domains ( $\alpha = .75$ ) by averaging together the items within each measure. We analyzed between-subjects differences in women’s sexual permissiveness, expected number of sex partners, and general attitudes toward nonsexual risk and disinhibition using a one-way (priming condition) MANOVA.<sup>2</sup> As predicted, women who described a time their father was disengaged reported more permissive sexual attitudes ( $M = 2.85$ ,  $SD = 1.84$ ) relative to women who described a time their mother was disengaged ( $M = 1.87$ ,  $SD = 1.16$ ),  $F(1, 60) = 6.03$ ,  $p = .017$ ,  $d = 0.64$ . In addition, women who described paternal disengagement reported expecting to have a greater number of future sex partners ( $M = 2.82$ ,  $SD = 2.24$ ) relative to women in the maternal disengagement condition ( $M = 1.79$ ,  $SD = 1.29$ ),  $F(1, 60) = 4.69$ ,  $p = .034$ ,  $d = 0.56$ . As expected, the analysis failed to reveal any between-subjects differences in participants’ general attitudes toward risk taking ( $p = .54$ ) or their

reported ability to exert self-control in nonsexual domains ( $p = .46$ ).

## Discussion

The results of Experiment 4 revealed that women primed with reminders of paternal disengagement reported more permissive sexual attitudes than women primed with maternal disengagement. Women in the paternal disengagement condition also reported expecting to have a greater number of sexual partners in the future relative to women not primed with these cues. These results provide additional experimental support for PIT, demonstrating that the effects of investment cues on daughters’ reproductive strategies are unique to fathers and do not extend to other forms of parental disengagement (i.e., maternal disengagement).

Experiment 4 also provided support for the hypothesis that the influence of paternal disengagement on women’s risky decision making and gratification seeking is specific to the sexual domain. Women who completed the paternal disengagement and maternal disengagement primes reported similar attitudes toward more general forms of risk taking and immediate (nonsexual) gratification. These results suggest that the influence of paternal disengagement cues on women’s sexual permissiveness is not merely a by-product of more domain-general decreases in behavioral restraint in response to feelings of rejection or abandonment (e.g., Baumeister, DeWall, Ciarocco, & Twenge, 2005; Chisholm, Quinlivan, Petersen, & Coall, 2005; Peterson, Buser, & Westburg, 2010; Twenge, Catanese, & Baumeister, 2002). Taken together, these results provide experimental support for predictions derived from PIT, suggesting the specificity of paternal investment cues in informing daughters’ short-term sexual strategies.

## Experiment 5: Effects of Paternal Disengagement on Men’s and Women’s Negativity Toward Condom Use

Experiments 1 through 4 provided experimental support for the hypothesis that paternal disengagement cues influence women’s

<sup>1</sup> The analysis did reveal marginal effects of priming condition on the pleasant–unpleasant ( $p = .06$ ) and positive–tired ( $p = .07$ ) dimensions of the BMIS, with participants in the paternal disengagement condition reporting mood states that were marginally more pleasant and positive than participants who described a time their mother was disengaged. Accordingly, we reanalyzed our data with these two factors included in the model as covariates. Specifically, we analyzed between-subjects differences on our dependent measures in a one-way (priming condition) MANCOVA, controlling for pleasantness and positivity scores. Again, women who described a time their father was disengaged reported more permissive sexual attitudes relative to women who described a time their mother was disengaged,  $F(1, 58) = 5.29$ ,  $p = .025$ . In addition, women who described paternal disengagement reported expecting to have a greater number of sex partners relative to women in the maternal disengagement condition,  $F(1, 58) = 4.56$ ,  $p = .037$ . Finally, as predicted, the analysis failed to reveal any between-subjects differences in women’s general attitudes toward risk taking ( $p = .63$ ) or their reported ability to exert self-control in nonsexual domains ( $p = .81$ ). Because the results remained unchanged while differences in pleasantness and positivity were controlled, we report the results from the MANOVA excluding these factors as covariates.

<sup>2</sup> We analyzed these results using a one-way MANOVA as opposed to a mixed model ANOVA because our dependent measures were presented on different scales (i.e., they had a varied number of scale points, and one item was an open response question, whereas the others were presented on Likert-type scales).

sexual decision making by increasing their (a) sexualized cognitions, (b) sexual permissiveness, and (c) desired number of sexual partners. Experiment 5 was designed to extend these results in two ways. First, we sought to examine whether primed paternal disengagement cues yielded attitudinal changes in women that promote risky sexual behaviors and the associated outcomes. Research indicates that girls growing up in father-absent households are more prone to teenage pregnancy and sexually transmitted disease than are girls from father-present homes (e.g., Coley et al., 2009; Ellis et al., 2003, 2012; Mackey & Coney, 2000). Thus, we predicted that experimentally priming paternal disengagement would increase women's negativity toward condom use—a measure predictive of engaging in unprotected sexual behavior (Sterk, Klein, & Elifson, 2004).

The second goal of Experiment 5 was to test whether the effects of paternal disengagement cues on sexual decision making are specific to women, as predicted by PIT (e.g., Coley et al., 2009; Ellis et al., 2003; James et al., 2012). Although some previous work has demonstrated an association between paternal involvement and sons' sexual behavior (e.g., Flewelling & Bauman, 1990; Kim & Smith, 1998; Lenciauskiene & Zaborskis, 2008), research typically has revealed a stronger unique effect of father absence on daughters' sexuality relative to sons' sexuality (e.g., Coley et al., 2009; Davis & Friel, 2001; James et al., 2012). Thus, we predicted that the effects of primed paternal disengagement cues would be specific to women and would not generalize to men's attitudes toward sexual risk.

## Method

**Participants.** Participants were 85 female and 92 male heterosexual undergraduates ( $M_{age} = 18.90$  years,  $SD = 2.62$ ; 88 in the paternal disengagement condition). Twenty-three individuals (nine women; 21 in the paternal disengagement condition) were excluded for failing to complete their assigned writing prompt as instructed, and all students received partial course credit in exchange for their participation. A majority of our participants were White (women:  $n = 66$ , men:  $n = 75$ ) and had biological parents who were currently married (women:  $n = 70$ , men:  $n = 70$ ). Regarding the race of the remaining participants, seven were Black (women:  $n = 4$ , men:  $n = 3$ ; five in the paternal disengagement condition), 15 were Hispanic (women:  $n = 5$ , men:  $n = 10$ ; seven in the paternal disengagement condition), and 14 were Asian American (women:  $n = 10$ , men:  $n = 4$ ; seven in the paternal disengagement condition). Regarding the family background of the remaining participants for whom these data were available, 16 had parents who were divorced or separated (women:  $n = 6$ , men:  $n = 10$ ; eight in the paternal disengagement condition), five reported that their mother or father was widowed (women:  $n = 1$ , men:  $n = 4$ ; three in the paternal disengagement condition), and 10 had biological parents who were never married (women:  $n = 6$ , men:  $n = 4$ ; seven in the paternal disengagement condition).

**Procedure and materials.** The priming procedure was similar to that used in Experiment 3, with participants being randomly assigned to describe a time their biological father or a close friend was absent for an important event in their lives. Following the priming procedure, participants completed a measure assessing their negativity toward condom use as well as the PANAS.

**Negativity toward condom use.** Participants were presented with seven items assessing their negative attitudes toward condom use. Items were taken from a modified version of Brown's (1984) Attitudes Toward Condoms Scale (e.g., "I dislike using condoms due to reduced sexual pleasure," and "Condoms ruin the mood because you have to stop to put one on"; see Sterk et al., 2004). The items were presented on scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and higher scores corresponded to more negative attitudes toward condom use.

## Results

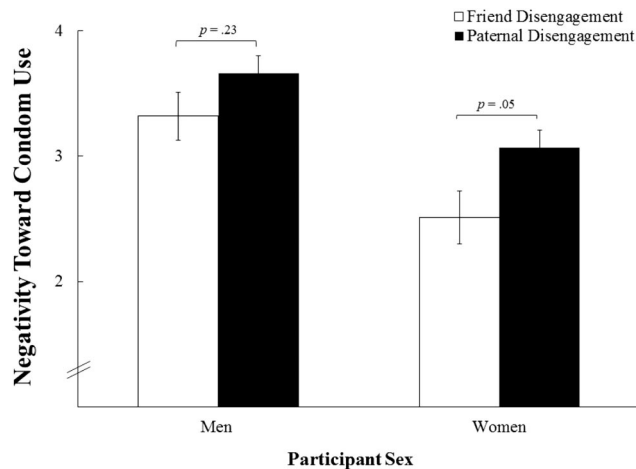
First, we computed participants' positive ( $\alpha = .89$ ) and negative ( $\alpha = .81$ ) affect scores on the PANAS. These scores were analyzed in a two-way (Participant Sex  $\times$  Priming Condition) between-subjects MANOVA. The analysis revealed no significant main effects or interactions between these factors on negative affect scores ( $ps \geq .27$ ). However, the analysis did reveal a significant main effect of participant sex on positive affect, with men ( $M = 2.58$ ,  $SD = 0.82$ ) reporting greater levels of positive affect relative to women ( $M = 2.30$ ,  $SD = 0.78$ ),  $F(1, 173) = 5.65$ ,  $p = .016$ ,  $d = 0.35$ . The MANOVA also revealed a significant interaction between participant sex and priming condition on positive affect scores,  $F(1, 173) = 6.06$ ,  $p = .015$ . Follow-up tests (Fisher's least significant difference [LSD]) revealed that men in the paternal disengagement condition reported greater positive affect ( $M = 2.71$ ,  $SD = 0.77$ ) relative to women in the same condition ( $M = 2.14$ ,  $SD = 0.67$ ),  $F(1, 173) = 11.44$ ,  $p = .001$ ,  $d = 0.79$ . Accordingly, positive affect was included as a covariate in subsequent analyses.

Next, we created a composite index of negativity toward condom use by averaging responses on the seven scale items ( $\alpha = .88$ ). This score was entered as the dependent measure in a two-way ANCOVA, controlling for positive affect. The analysis revealed significant main effects of participant sex,  $F(1, 172) = 11.95$ ,  $p = .001$ ,  $d = 0.53$ , and condition,  $F(1, 172) = 5.10$ ,  $p = .025$ ,  $d = 0.33$ , on condom attitudes. Specifically, men and participants in the paternal disengagement condition reported more negative attitudes toward condom use overall relative to women and participants in the friend disengagement condition, respectively. Although the analysis failed to reveal a significant interaction between priming condition and participant sex ( $p = .58$ ), follow-up tests (Fisher's LSD,  $p < .05$ ) revealed the predicted simple effect of paternal disengagement on women's condom attitudes. Specifically, women in the paternal disengagement condition reported more negative attitudes toward condom use ( $M = 3.07$ ,  $SD = 1.30$ ) compared with women in the friend disengagement condition ( $M = 2.51$ ,  $SD = 1.35$ ),  $F(1, 172) = 3.76$ ,  $p = .054$ ,  $d = 0.42$  (see Figure 1). For men, however, the simple effect of priming condition on condom attitudes was not significant ( $p = .23$ ).

## Discussion

Experiment 5 provided additional support for the hypothesis that paternal investment has a causal impact on daughters' sexual decision making. Specifically, locally activated cues to paternal disengagement increased women's negativity toward condom use relative to women who described friend disengagement. This find-





**Figure 1.** The effects of participant sex and priming condition (paternal disengagement vs. friend disengagement) on men's and women's attitudes toward condom use (Experiment 5). Higher values correspond to more negative attitudes toward condom use. Errors bars reflect the standard errors.

ing is consistent with research demonstrating a reliable link between father absence and women's risky sexual behavior and outcomes (e.g., Ellis et al., 2003; James et al., 2012; Mackey & Coney, 2000) and contributes to a growing body of research demonstrating that attitudes toward condom use are sensitive to adaptively relevant cues present in one's local environment (e.g., Tybur, Bryan, Magnan, & Hooper, 2011). Although we could not directly assess shifts in women's risky sexual behavior in response to primed paternal disengagement cues, women's attitudes toward condom use are predictive of the frequency with which they actually engage in unprotected sexual behaviors (Sterk et al., 2004). Accordingly, our results suggest that paternal disengagement may render women increasingly willing to engage in unsafe sexual practices. This risky shift may contribute to the associations reliably observed between father absence and daughters' increased teen pregnancy and STI risk (Ellis et al., 2003, 2012; James et al., 2012; Mackey & Coney, 2000).

Additionally, although the interaction between participant sex and priming condition was not statistically significant, the effect of primed paternal disengagement on negativity toward condom use was stronger for women than for men. This result is in line with predictions derived from PIT and with research demonstrating a stronger unique effect of fathers on daughters' sexual and reproductive outcomes relative to sons' (e.g., Coley et al., 2009; Davis & Friel, 2001; Ellis et al., 2012; James et al., 2012). Though some research suggests that father absence is associated with early sexual activity in boys (Kim & Smith, 1998; Lenciauskiene & Zaborskis, 2008), our results provide preliminary support for paternal investment having a stronger effect on women's risky sexual strategies than on men's.

### General Discussion

Researchers frequently observe a robust association between father absence—or low-quality paternal investment—and daughters' accelerated development, sexual promiscuity, and younger

age at first reproduction (e.g., Ellis et al., 1999, 2003; James et al., 2012). According to PIT (e.g., Ellis et al., 2012), these associations result from father presence/absence providing important information about the local mating system, which plays a causal role in shaping daughters' sexual strategies. Although PIT has been well supported by several correlational studies and natural experiments (e.g., Ellis et al., 2012; Tither & Ellis, 2008), hypotheses derived from PIT had not previously been tested experimentally. In a series of five experiments using multiple measures and comparison groups, priming paternal disengagement increased women's sexualized thoughts (Experiment 1), sexual permissiveness and desired number of sex partners (Experiments 2–4), and negativity toward condom use (Experiment 5). These results were not accounted for by negative affective responses to the primes (Experiments 2–5), generalized upset due to disappointment by any close other (Experiments 3–5), or a general risky shift in response to increased feelings of rejection or abandonment (Experiments 4). The effects of primed paternal disengagement on sexual risk were also found to be stronger for women than for men (Experiment 5).

Taken together, the results of the current research provide the first experimental support for PIT by demonstrating a causal relationship between paternal disengagement cues and changes in women's sexual decision making. Although we were unable to assess the long-term effects of these primed cues or their effects on actual sexual behaviors, the current findings elucidate some of the psychological shifts—such as increased activation of sexual thoughts and more permissive sexual attitudes—that may contribute to daughters' increased sexual riskiness in response to father absence (e.g., Coley et al., 2009; Ellis et al., 2003, 2012; James et al., 2012). In so doing, this work provides a foundation for future experimental investigations into the effects of paternal disengagement on women's beliefs about men, the local mating ecology, and behavioral interactions with prospective partners. Insight gained from this research may help inform interventions aimed at reducing some of the personal and financial costs associated with father absence, including teen pregnancy and STI risk.

### Limitations and Future Directions

Although the current studies are an important first step in this line of research, future experiments are needed to examine the precise nature of the psychological changes that women experience in response to paternal disengagement. PIT posits that father absence provides women with information about the necessity and likelihood of receiving male investment in the local mating ecology (e.g., Belles, Kunde, & Neumann, 2010; Del Giudice & Belsky, 2011; Draper & Harpending, 1982; Ellis et al., 2012; James et al., 2012; Simpson & Belsky, 2008). This postulate has been supported by research demonstrating that daughters of widows—whose fathers are involuntarily absent—do not experience the accelerated sexual development typically observed in girls whose fathers are absent due to marital discord or disruption (Draper & Harpending, 1982; Hetherington, 1972). A critical next step in this research program is to examine whether paternal disengagement cues actually influence women's expectations regarding the level of investment they are likely to receive from future mates or the necessity of male investment. Although the presence of such conscious level shifts is not critical to PIT, if

observed, these results would provide powerful support for this theoretical perspective.

Additional research is also needed to examine whether women's family history (i.e., whether they come from disrupted or intact families) interacts with our experimental primes to influence their sexual decision making in theoretically meaningful ways. Recent research suggests that women's responses to experimentally activated socioecological stressors vary based on their developmental history (e.g., family SES during childhood; Griskevicius, Delton, Robertson, & Tybur, 2011; Griskevicius, Tybur, Delton, & Robertson, 2011). Specifically, individuals growing up in more stressful childhood environments tend to respond to local ecological threats by favoring more immediate reproductive goals, whereas those from more benign environments respond to these cues by favoring delayed reproduction (Griskevicius, Delton, et al., 2011). It is thus possible that women's responses to primed paternal disengagement cues may also vary based on their developmental history—in this case, their parents' marital status during the women's childhood. This possibility was not examined in the current study due to the majority of our participants coming from intact families. Approximately 76% of female participants across five experiments (279 out of 366) reported that their biological parents were currently married. Therefore, it is possible that our results may not generalize to women who experienced actual and sustained absence of their biological father during development. It is also possible that women from single-parent homes might be more sensitive to cues signaling paternal disengagement and demonstrate an even stronger response to our experimental prime. Although future research is needed to examine analogous effects in more diverse populations and interactive effects between the experimental primes and women's family background, one of the strengths of the current research is the emergence of these father-daughter effects within samples of women from relatively advantaged, intact families.

Although our studies produced the pattern of findings predicted by PIT, it is important to note that the female participants still expressed relatively conservative attitudes toward uncommitted sex and sexual risk. In Experiments 2–5, for example, women's mean responses to the dependent measures fell below the scale midpoints, regardless of priming condition. In other words, female participants across these experiments reported relatively negative attitudes toward uncommitted (Experiments 2–4) and unprotected (Experiment 5) sex. This pattern of results likely reflects the steep cost of reproduction—and, therefore, of risky sexual activity—for women. Relative to costs for men, the costs associated with reproduction for women are high (Trivers, 1972). This increased obligatory parental investment has implications for the reproductive strategies preferentially utilized by women, and numerous studies have demonstrated women's clear and consistent preference for committed, long-term (vs. uncommitted, short-term) relationships (e.g., Buss, 2008; Buss & Schmitt, 1993). This pattern of results may also be due to the limited diversity of our participants, who were likely following relatively slow reproductive strategies (as noted earlier). Although participants in our studies were still largely opposed to taking sexual risks, that the experimental prime was able to shift women away from this evolutionarily reinforced preference illustrates the contextual sensitivity of women's sexual attitudes to local environmental cues.

Because we were specifically interested in experimentally replicating the effects of father absence most frequently documented in the developmental literature and predicted by PIT (e.g., Ellis et al., 2012), the current studies focused largely on women's mating psychology. Although Experiment 5 suggested that the effect of paternal disengagement on risky sexual attitudes may be stronger for women than for men, the interaction was not significant, and the reported sex difference should be interpreted with caution. Indeed, a life history perspective and more general evolutionary-developmental perspectives (e.g., psychosocial acceleration theory; Belsky et al., 1991) suggest that men's psychology and behavior should also be sensitive to the environmental stress and hardship that often characterize father-absent homes. Consistent with this view, research has demonstrated that father absence is associated with increased aggression, exaggerated masculinity, and earlier intercourse among males (Alvergne, Faurie, & Raymond, 2008; Draper & Harpending, 1982; Kim & Smith, 1998). Though the effects of father absence on boys' development and sexuality are less well established than they are for girls and PIT posits a unique impact of fathers on daughters' sexual outcomes (e.g., James et al., 2012), future research should examine more rigorously the extent to which local paternal disengagement cues influence different forms of dominance striving and sexual decision making among men.

A final limitation of the current work was the exclusive reliance on self-report measures to test the effects of paternal disengagement cues on women's sexual decision making. A variety of self-report measures were used (e.g., a word-stem completion task, attitudinal measures, and items assessing behavioral intentions); however, we did not assess shifts in observable or hypothetical behavior in response to the prime or women's implicit responses to paternal disengagement cues. Although theory and research suggests that women's sexual attitudes and intentions are predictive of women's actual engaging in sexual acts (e.g., Ajzen, 1991; Ajzen & Fishbein, 1980; Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Sterk et al., 2004), future research should examine the local effects of paternal disengagement cues using behavioral or implicit response measures to assess more fully the impact of the priming procedure on women's sexual decision making.

## Conclusion

The sexualization of young girls has become a topic of increasing concern in recent years, and many have targeted the Western media as a primary contributor to this trend (e.g., American Psychological Association, 2007; Brookes & Kelly, 2009; Durham, 2008; Levin & Kilbourne, 2008). Although researchers have demonstrated the effects of popular media influence on girls' tendency to view themselves as sexual objects (Gordon, 2008; Grabe & Hyde, 2009), an abundance of research also suggests the robust effects that other environmental factors might have on girls' accelerated sexuality (e.g., Ellis et al., 1999, 2003, 2012; James et al., 2012). For example, previous correlational research and natural experiments consistently have demonstrated an association between father absence—or low-quality paternal investment—and women's increased sexual risk. The present experiments build on this research by demonstrating the causal impact of locally activated paternal disengagement cues on daughters' sexual decision

making. In so doing, the current work suggests the important role that biological fathers may play in shaping the reproductive strategies endorsed by females.

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Received July 27, 2012

Revision received March 15, 2013

Accepted March 28, 2013 ■

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