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Original Article

**LACK OF CONDOM USE AT FIRST SEX BY MEN LINKED
TO EARLY PSYCHOSOCIAL STRESS**

Nicole Koehler

*School of Anatomy and Human Biology
The University of Western Australia*

James S. Chisholm

*School of Anatomy and Human Biology
The University of Western Australia*

Abstract: Life history theory suggests that in risky and uncertain environments it can be adaptive to be risk-prone. Failing to use a condom to prevent sexually transmitted infections and/or unwanted pregnancy is one form of risky activity. On the assumption that risky or uncertain environments are experienced subjectively as psychosocial stress we explored the relationship between early psychosocial stress and condom use at first sex in heterosexually active women and men. Early psychosocial stress was higher in men who did not use a condom than those that did, suggesting that the potential benefits of engaging in such a risky behaviour outweigh the long-term benefits of safe-sex. Unlike in men, however, condom use was unrelated to early psychosocial stress in women, perhaps because they have less control over condom use than men.

Keywords: life history theory, condom use, psychosocial stress

Introduction

Risk-taking is defined as behavior that could endanger the risk taker's well-being (Hill et al., 1997; Wilder & Watt, 2002). Choosing to take a risk entails balancing costs and benefits; walking home alone through a dangerous neighborhood, for example, saves a taxi fare at the cost of possible mugging. Not everyone, however, balances such costs and benefits in the same way and understanding why some are risk-prone and others risk-averse has been a central concern in the psychology of risk (e.g., Ainslie, 2001; Bell & Bell 1993). Here individual differences are approached in a particular kind of risk-taking – contraceptive use (especially condom use) – from the perspective of life history theory.

AUTHOR NOTE: Please address all correspondence to: Dr Nicole Koehler, School of Anatomy & Human Biology
Mail Bag Delivery Point M309, The University of Western Australia, 35 Stirling Highway, Crawley WA 6009,
AUSTRALIA Email: Nicole.Koehler@uwa.edu.au

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Life history theory

Life history theory is the study of life cycles and life history traits (e.g., age at maturation and first birth, number of offspring, parental investment, life span, etc.) in the framework of evolutionary ecology (e.g., Hill & Kaplan, 1999; Stearns, 1989, 1992). Fundamental to life history theory are tradeoffs among the components of fitness. While fitness is measured in terms of reproductive success, it actually consists of survival, growth and development, and reproduction (producing and rearing offspring), which are forms of work – the work required to leave descendants. Therefore, because all work requires resources (energy, nutrients, time, etc.), which are always limited, but selection always favors organisms who leave more descendants (i.e., fitness is always relative), it is not possible to maximize all the components of fitness simultaneously and tradeoffs are inevitable (Gadgil & Bossert, 1970; Stearns, 1992).

There are many tradeoffs (e.g., survival vs. reproduction, growth vs. survival, producing vs. rearing offspring, etc.), but the most encompassing seems to be that between current and future reproduction. The current-future tradeoff is the logical proposition that beyond some threshold, increased reproduction in the short term (current reproduction) will decrease the number of descendants in the long term (future reproduction) because resources consumed for bearing or rearing offspring in the short term would have resulted in more descendants in the long term had they been consumed in the future, and/or because current reproduction reduces parents' capability of surviving and thus bearing or rearing future offspring. Selection is therefore no longer expected to favor mechanisms that simply maximize number of offspring (current reproduction) because under certain circumstances consistently producing a small number of high quality offspring (i.e., with a high probability of survival and reproduction) results in more descendants in the long term (future reproduction) than having many low quality offspring. This is because producing a small number of high quality offspring, generation after generation, reduces the intergenerational variance in number of offspring, which in turn maximizes the number of future descendants.

The major determinant of the optimal tradeoff between current and future reproduction are local mortality rates. In risky and uncertain environments the quantity, quality and dependability of resources required for survival are problematic, so mortality rates are high or unpredictable and the greatest adaptive problem is to have any descendants at all (Borgerhoff Mulder, 1992; Charnov, 1993; Gillespie, 1977; Harpending et al., 1990; Hill & Kaplan, 1999; Kaplan, 1994; Promislow & Harvey, 1990, 1991; Stearns, 1992). Selection is therefore expected to favor mechanisms for maximizing current reproduction, which minimizes the chance of lineage extinction (Ellison, 1994; Keyfitz, 1977).

Draper and Harpending (1982) theorized that father-absent children learn that unstable paternal care is appropriate, in the case of males, or unimportant in the case of females; father-absent males are therefore expected to provide little paternal investment themselves, and father-absent females are expected to find it difficult to maintain a stable relationship with just one man. Belsky et al. (1991) extended Draper and Harpending's theory and suggested that children learn about the availability and predictability of resources through the attachment process during the first 5 to 7 years of life. Insecure attachment sets individuals on a developmental trajectory leading to a "quantitative"

reproductive strategy via accelerating biological maturation while secure attachment leads to a “qualitative” reproductive strategy via delaying biological maturation. Chisholm (1993) reinterpreted Belsky et al.’s attachment model of the development of alternative reproductive strategies from a life history theory perspective and the effect of local mortality rates. He suggested that children learn about local mortality rates indirectly through their flow-on effects on the attachment process.

One mechanism for minimizing the chances of lineage extinction may be a propensity for risk-taking. This is because in risky and uncertain environments, with high mortality rates, immediate rewards are more likely to maximize fitness than long term rewards, which must be devalued by the probability of surviving long enough to achieve them (Gardner, 1993; Chisholm, 1999a, 1999b; Hill et al., 1997; Kacelnik & Bateson, 1996). Consistent with this view, previous research has shown that individuals raised in environments of high risk and uncertainty (e.g., father-absent or abusive households) are more likely to engage in risky behaviors such as getting involved in fights, breaking rules (Berezkei & Csanaky, 1996), tobacco, alcohol and illicit drug use (Chen et al., 2006; Felitti et al., 1998; Moran et al., 2004; Rodgers et al., 2004; Stock et al., 1997; Zierler et al., 1991), driving while intoxicated (Rodgers et al., 2004), pathological gambling (Petry & Steinberg, 2005), engaging in sexual activity at a younger age, with more partners and after a shorter duration of meeting their partner (Testa et al., 2005), and exchanging sex for money or drugs (Parillo et al., 2001).

Evidence that individuals reared in environments of high risk and uncertainty are more likely to take risks makes sense not only from a life history theory perspective but also from the psychology of time preference, which suggests that individuals with early psychosocial stress are less likely to delay gratification. Mischel (1958, 1961) for example found that father-absent children are less likely to delay gratification (by favoring a small, immediate reward over a larger, delayed reward) than father-present children.

The present study focuses on one form of sexual risk-taking, failing to use contraception (especially condom use) at first sex, because it is intimately related to reproductive effort and because it has public health implications (e.g., sexually transmitted diseases [STDs]). Furthermore, failing to use contraception is associated with other risky activities, some of which are also important from a public health perspective, such as cigarette smoking, drug use, alcohol use, exposure to physical injury (Biglan et al., 1990; Shrier et al., 1996; Wilder & Watt, 2002; but see also Choquet & Manfredi, 1992; Flisher & Chalton, 2001) and higher impulsiveness (Brown et al., 1992; Kahn et al., 2002; but also see Breakwell, 1996; White & Johnson, 1988).

Early stress and contraception use

A few studies have examined the relationship between contraceptive use and various measures of early psychosocial stress. Sexually active young adults who experienced childhood adversity between the ages of 6 and 13 years (parental absence, neighborhood crime and family poverty) practiced “unsafe sex” more frequently than those who did not (Hill et al., 1997). Hill et al. also found a trend between failing to use birth control and childhood adversity, such that those with higher levels of childhood adversity were less likely to use birth control. Women who lived with both parents at age 14 were significantly more likely to use contraception at first sex than those who lived

with one or neither parent (Mosher & Bachrach, 1987). Sexually active school girls who reported physical and/or sexual abuse were twice as likely not to have used contraception at last sex as those that reported no abuse (Stock et al., 1997). Similarly, Mason et al. (1998) found that sexually abused incarcerated men and women were significantly less likely to use contraception than those not reporting abuse, and those that reported no history of sexual abuse were more likely to report that condoms were their contraceptive method of choice (Mason et al., 1998).

On the other hand, Zierler et al. (1991) found no difference in reported lack of condom use in the year prior to the study by women and men (some of which were infected with HIV) reporting childhood abuse and those reporting no abuse. Also inconsistent with previous findings, Gutierrez and Barr (2003) found that abused Native American and Mexican American women, recruited from drug treatment programs, who reported a high concern about becoming pregnant, were significantly more likely to report the use of contraception than non-abused individuals. No difference in contraceptive use was found between abused and non-abused European American women, who reported a high concern for pregnancy, or amongst European American, Native American and Mexican American women, all of whom reported a low concern for pregnancy (Gutierrez & Barr, 2003).

Early stress and sexually transmitted diseases

Men and women with adverse childhood experiences were more likely to report a history of STDs than those with no adverse childhood experiences (Felitti et al., 1998; Hillis et al., 2000). Hillis et al. (2000) found that the prevalence of STDs increased as the number of adverse childhood experiences increased, but most of these relationships were reduced substantially or lost statistical significance after controlling for the effects of age at first sex, having had more than 30 sexual partners and substance abuse problems. Men who reported childhood sexual abuse were twice as likely to report HIV infection as non-abused individuals, results which were not explained by intravenous drug use (Zierler et al., 1991). Felitti et al.'s and Hillis et al.'s findings are limited in that it is not possible to distinguish whether the STDs resulted from unprotected sex, sharing needles or some other means. Newcomb et al. (2003) examined whether childhood experiences had effects on high HIV-risk behaviors in Latina women amongst whom HIV acquisition and transmission is disproportionately high within the United States. Unexpectedly, few childhood experiences (e.g., family neglect, family abuse) directly predicted high HIV-risk behaviors (e.g., condom use, HIV protective behaviors).

The Present Study

Although some previous studies (e.g., Hill et al., 1997; Mosher & Bachrach, 1987; Stock et al., 1997) support the idea that early psychosocial stress may lead to risky sexual behavior these studies are limited in being restricted to a small number of early psychosocial stressors (e.g., Hill et al., 1997; Mosher & Bachrach, 1987) or are limited to female school children (e.g., Stock et al., 1997). Furthermore, some studies (e.g., Gutierrez & Barr, 2003; Mason et al., 1998) are limited to drug users or incarcerated individuals in which early psychosocial stress may be overrepresented and thus mixed findings have been obtained between early psychosocial stress and contraceptive use.

Thus, our aim was to determine whether individuals that did and did not use a condom at first sex differed in their levels of early psychosocial stress by using a wider spectrum of early psychosocial stressors in a non-prison population where early psychosocial stress is likely not overrepresented. We also examine whether individuals that did and did not use any method of contraception at first sex differed in their levels of early psychosocial stress. Contraceptive use generally and condom use specifically were examined at first sex for several reasons: a) because the deliberate intention of conceiving at this time is unlikely; b) because age at first sex is a life history trait that is proposed to be affected by early psychosocial stress (Belsky et al., 1991; Chisholm, 1993; Draper & Harpending, 1982), an idea that has been supported by several studies (e.g., Quinlan, 2003; Stock et al., 1997; Vigil et al., 2005); and c) because age at first sex has been shown to be remembered reliably (Dunne et al., 1997; Hornberger et al., 1995), suggesting that contraceptive use at this time may also be recalled reliably. Furthermore, it is estimated that Americans aged 15-24 years, who represent 25% of the ever sexually active population, acquire approximately half of all new STDs (Weinstock et al., 2004). Thus such an investigation may be of significant public health importance. Given that individuals with early psychosocial stress are more inclined to partake in risky behaviors and have shorter time preferences, we hypothesized that early psychosocial stress scores would be higher amongst individuals that did not use a condom / any form of contraception at first sex than those that did.

Method

Participants

The present study was part of a larger project study investigating the relationship between early psychosocial stress and life history traits, mate choice and sexual behavior. Participants were recruited from university communities (The University of Queensland: $N = 292$; The University of Western Australia: $N = 192$; Curtin University of Technology: $N = 132$), the general community via advertisements mailed to various Western Australian medical centers ($N = 1$), family friends ($N = 5$), work colleagues ($N = 19$), by word of mouth ($N = 79$), by placing questionnaires at an annual University of Western Australia Expo in September 2005 ($N = 19$) and from sources unknown because participants did not indicate where they heard about the study during the recruitment procedure ($N = 19$). All participants were given the opportunity to win one of ten \$50 personal checks as compensation for their time. Questionnaires were returned by 326 women and 233 men. However, only data for heterosexual participants that reported having had consensual heterosexual vaginal sex, who were at least 18 years of age and reported no known fertility problems were included within the present study (Women: $N = 229$; Men: $N = 161$). These women and men had a mean age of 28.3 years ($SD = 10.7$; range = 18 – 64 years) and 26.8 years ($SD = 9.6$; range = 18 – 64 years) respectively.

Procedure

Early psychosocial stress was assessed by asking participants to indicate the occurrence and frequency of the following events during the first seven years of their life: psychological abuse (3 questions), physical abuse (2 questions), sexual abuse (by household members: 4 questions; by non-household members: 4 questions), father's or

father figure's abuse of mother (4 questions), substance abuse by household members (2 questions), household member imprisonment (1 question), the presence of mentally ill/suicidal household members (2 questions), the occurrence of parental divorce/separation (1 question) (from Anda et al., 2002; Dietz et al., 1999; Dong et al., 2003, 2004; Felitti et al., 1998), the death of various family members (mother, father, siblings, other family members living with the participant), and absence of the mother and father "for what seemed like a long time" (both from Chisholm, 1999a). Unlike previous studies (e.g., Anda et al., 2002), the distinction between abuse by household and non-household members was made because the effects of sexual abuse are more severe if the abuser was a family member than not (Kendall-Tackett et al., 1993). Participants were also asked to complete nine 7-point ratings scales (from Kim & Smith, 1998a, 1998b) about self-mother ('self' meaning themselves), self-father, mother-father relationships and the general quality of family life between birth and up to and including age 7 years. The ages between 0 and 7 years were chosen to reflect Belsky et al. (1991) proposed sensitive period for attachment formation.

Sexually active participants (Women: $N = 229$; Men: $N = 161$) were asked whether they did or did not use contraception when they engaged in consensual heterosexual vaginal sex for the first time and to specify the type of contraception used where applicable. Over 70% of participants reported that they used contraception at first sex (the largest portion of participants used a condom exclusively; Women: 59.1%, Men: 60.9%). Participants who responded that they used contraception, irrespective of method used, were labeled as belonging to the 'contraceptive use' category whereas those that did not indicate contraceptive use were labeled as belonging to the 'no contraceptive use' category. We then divided contraceptive using participants into two further categories based on whether they reported using a condom ('condom use') or not ('no condom use'), with the intention of separating participants who used contraception that would protect them from STDs from those who used contraception that would not.

Results

Blank, non-applicable and "never/no" responses to early psychosocial stress items were classified as lack of exposure to early psychosocial stress. Participants who responded with "once or twice", "sometimes", "often", "very often" (frequency ratings) or affirmatively (dichotomous questions) were given a score of 1 per category, whereas all other responses for all questions within a category were scored as 0 for that category. For the nine rating scales a score of 1 denoting the presence of early psychosocial stress was assigned per rating between 1 and 3, whereas ratings between 4 and 7 were scored as 0. Thus, participants could obtain a maximum early psychosocial stress score of 24, indicating exposure to at least one form of stress per category. Early psychosocial stress scores ranged from 0 ($N = 23$) to 18 in sexually active women ($M = 4.49$, $SD = 3.78$) and 0 ($N = 19$) to 17 in sexually active men ($M = 3.76$, $SD = 3.21$).

Independent samples t -tests showed that men who used a condom at first sex had significantly lower levels of early psychosocial stress than those that did not, $t_{159} = 2.91$, $p = .002$, one-tailed (Condom use: $M = 3.09$, $SD = 2.78$; No condom use: $M = 4.54$, $SD = 3.52$; Fig. 1). On the other hand, early psychosocial stress scores did not significantly differ between women who used a condom at first sex and those that did not, $t_{227} = 0.45$,

$p = .325$, one-tailed (Condom use: $M = 4.59$, $SD = 3.98$; No condom use: $M = 4.36$, $SD = 3.51$; Fig. 1).

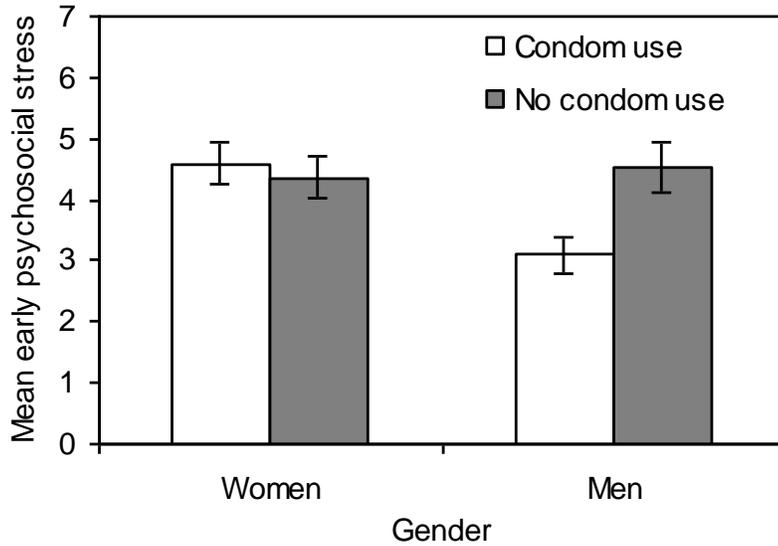


Figure 1. Early psychosocial stress and condom usage. Mean early psychosocial stress experienced by individuals who did (Women: $N = 129$; Men: $N = 87$) and did not (Women: $N = 100$; Men: $N = 74$) use a condom at first sex. Standard error bars are shown.

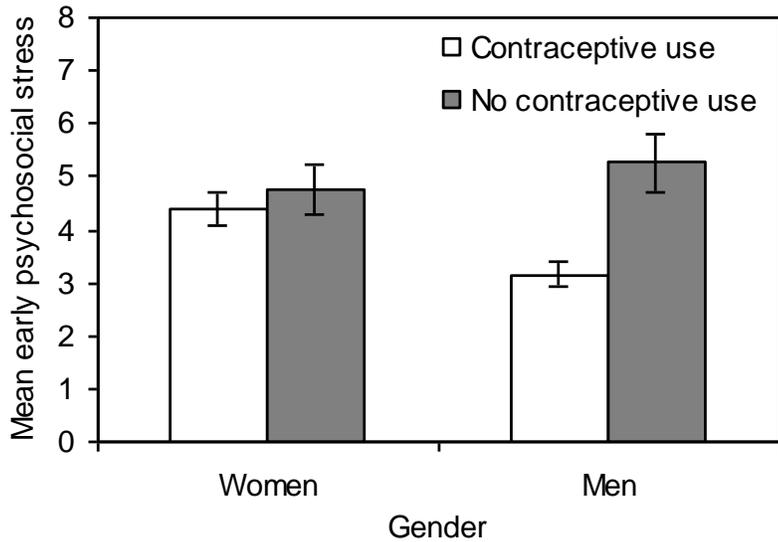


Figure 2. Early psychosocial stress and contraceptive usage. Mean early psychosocial stress experienced by individuals who did (Women: $N = 169$; Men: $N = 115$) and did not (Women: $N = 60$; Men: $N = 46$) use any form of contraception at first sex. Standard error bars are shown.

Participants who did not use contraception at first sex had higher levels of early psychosocial stress than those that used any form of contraception (Fig. 2), but this difference only reached statistical significance in men, $t_{159} = 3.92$, $p \leq .001$ (Contraceptive use: $M = 3.16$, $SD = 2.72$; No contraceptive use: $M = 5.26$, $SD = 3.85$), and not women, $t_{227} = 0.62$, $p = .267$ (Contraceptive use: $M = 4.40$, $SD = 3.85$; No contraceptive use: $M = 4.75$, $SD = 3.60$), both one-tailed (independent samples t -tests).

Discussion

As predicted, men who did not use a condom at first sex had significantly higher levels of early psychosocial stress than those that did. This may be because men with low levels of early psychosocial stress find the benefits of not using a condom (e.g., immediate gratification, spontaneity) more salient than its potential later costs (e.g., STDs, unintended pregnancy). Furthermore, to the extent that early psychosocial stress indexes environmental risk and uncertainty (Chisholm, 1999b), and that early reproduction is adaptive in such environments (Ellison, 1994; Keyfitz, 1977; Stearns, 1992), then unintended pregnancy may be of less concern to men experiencing high levels of early psychosocial stress. This might explain too why men who used no contraception at first sex reported more early psychosocial stress than those who did not use contraception. Thus, the short time preference or impulsiveness of men who experience more early psychosocial stress (Bereczkei & Csanaky, 1996; Stock, 1997; Zierler et al., 1991) may be part of a mechanism for minimizing the chance of lineage extinction.

However, unlike men, no significant difference in early psychosocial stress scores were found between women who used a condom at first sex and those who did not, perhaps because women have less control over the decision to use a condom, a possibility that warrants further investigation. Likewise, no difference in early psychosocial stress scores was found between women who used any form of contraception at first sex and those who did not. It must be noted that the majority of women who used any form of contraction at first sex used a condom. Thus, given that condom use was unrelated to early psychosocial stress, it is not surprising that contraceptive use in general was unrelated to early psychosocial stress. Perhaps early psychosocial stress scores differed significantly in men but not women who did and did not use contraception at first sex because women have to invest considerably more initially in reproduction than men (Trivers, 1972). Thus, compared to men, an unintentional pregnancy may be more costly for women irrespective of their level of early psychosocial stress and therefore no difference in early psychosocial stress scores were found in women who did and did not use contraception at first and/or last sex.

Like our study, Mosher and Bachrach (1987) also examined contraceptive use at first sex in women. However, our results showing no difference in early psychosocial stress scores between women who used contraception at first sex and those that did not are inconsistent with Mosher and Bachrach's (1987) findings showing that women who lived with both parents at age 14 were significantly more likely to use contraception at first sex than those who lived with one or neither parent. Methodological differences between Mosher and Bachrach's study and our study may account for why we failed to find a difference in early psychosocial stress scores between the two groups of women. For example Mosher and Bachrach's sample size of over 5000 women greatly exceeds

that used in our study. On the other hand, compared to Mosher and Bachrach's study, our study is not limited to the examination of a single early psychosocial stressor. Furthermore, unlike Mosher and Bachrach's study, our assessment of early psychosocial stress is restricted the first 7 years of life to reflect Belsky et al.'s (1991) proposed sensitive period for attachment formation and importantly it precedes the timing of first sex in all participants which may not be the case in some of Mosher and Bachrach's participants. It must also be noted that our data was collected over two decades later than that collected by Mosher and Bachrach. Contraceptive use at first sex has changed substantially over the last few decades (e.g., contraception at first sex increased from the early 1960s to the early 1980s, Mosher & Bachrach, 1987), which is also evident in our study (74% of women used contraception at first sex) compared to Mosher and Bachrach's sample of women surveyed in 1982 (47% of women used contraception at first sex). These differences in the samples of women assessed could also have something to do with why we were unable to replicate Mosher and Bachrach's study using our early psychosocial stress measure.

Limitations

The present study, as well as numerous similar studies, is limited in that it is based on retrospective data and used a self-selected sample. With regards to the retrospective assessment of early psychosocial stresses, it can be argued that individuals may have had difficulty recalling whether a particular event occurred. This may be particularly applicable to the older group of participants who had to recall events that occurred as much as over 57 years ago. However, although the limitation of recall difficulties may be true for some events, it is unlikely that participants would have experienced difficulties recalling rather salient events such as the death of a parent or the divorce of their parents. Furthermore, it is well known that individuals can reliably recall major events that occurred quite some time ago, such as their age at menarche (e.g., Must et al., 2002) or age at first sex (e.g., Dunne et al., 1997). To overcome the limitation of using retrospective data future studies may benefit from studying participants in a longitudinal fashion from birth onwards. However, these types of studies have their own limitations – time, expense and drop-out effects.

The use of a self-selected sample limits the present study in that it is not based on an entirely random sample. Future studies may benefit from randomly selecting individuals (e.g., from a birth registry) to obtain a more representative sample. However, even if participants were randomly selected at birth to participate in a longitudinal study the potential for non-random drop-out effects is inevitable. Given that participants in the present study were unlikely to foresee the nature of the study, based on the information provided at recruitment, it is unlikely that individuals with some unknown attribute, which could potentially bias the results, volunteered to participate whereas others did not. Thus, using an entirely random sample of individuals studied longitudinally may not substantially alter the findings reported.

Conclusion

In conclusion, men, but not women, who used a condom at first sex had lower levels of early psychosocial stress than those that did not. Similarly, men, but not

women, who used any method of contraception at first sex had lower levels of early psychosocial stress than those that did not. These results indicate the value of life history theory and sexual selection theory for understanding sexual behavior and contraceptive use.

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