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## Female attractiveness mediates the relationship between in-pair copulation frequency and men's mate retention behaviors

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### ABSTRACT

More attractive women are more likely to be pursued as mates by men other than their long-term partner and, therefore, to place their partner at greater risk of cuckoldry (investing unwittingly in a child to whom he is genetically unrelated). Men partnered to more attractive women perform more mate retention behaviors – behaviors designed to thwart a woman's infidelity. With greater risk of female infidelity, men may perform additional anti-cuckoldry tactics such as frequent in-pair copulations (IPC). We secured self-reports from 277 men in a long-term relationship and investigated: (1) the relationship between female partner's attractiveness and IPC frequency and (2) the mediating role of female partner's attractiveness on the relationship between IPC frequency and male mate retention behaviors. The results indicated that female attractiveness: (1) predicts IPC frequency and (2) partially mediates the relationship between IPC frequency and male mate retention behaviors. The discussion addresses the mediated relationship, notes limitations of the research, and highlights directions for future research.

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### 1. Introduction

Over human evolutionary history, men have faced the adaptive problem of a long-term partner's sexual infidelity and subsequent cuckoldry – or the unwitting investment in genetically unrelated offspring. The reproductive costs of cuckoldry, including loss of time, resources, and alternative mating opportunities, are potentially so large that men may have evolved psychological mechanisms that motivate performance of anti-cuckoldry tactics. Mate retention behaviors are one class of anti-cuckoldry tactics. These behaviors vary in the costs inflicted upon partners, ranging from subtle manipulation to physical violence. They function to deter rivals from encroaching on the relationship and to prevent female partners from committing infidelities or defecting from the relationship (Buss & Shackelford, 1997).

Frequent in-pair copulation (IPC) is another anti-cuckoldry behavior observed in human and non-human species. IPC may function as a sperm competition tactic evolved to decrease the risk of cuckoldry by increasing the number of functional sperm in the female's reproductive tract (Baker & Bellis, 1993). Frequent IPC as a sperm competition tactic may help to explain why men continue to be interested in copulating with their partner over the duration of a mateship (Klusmann, 2002).

#### 1.1. Perceived female attractiveness and IPC frequency

Mate retention behaviors vary in evolutionarily predictive ways (Trivers, 1972). Buss and Shackelford (1997) documented a positive relationship between men's mate retention efforts and perceived attractiveness of their partners. Youth and attractiveness are cues to women's reproductive value (expected future reproduction; Buss, 1989; Symons, 1979) and, in turn, might attract the attention of men other than a woman's long-term partner and increase the risk of a woman's infidelity. Men who perceive their partner to be more attractive perform more mate retention behaviors such as resource display, send more signals of "possession" of their partner, and make more intrasexual threats (Buss & Shackelford, 1997). Buss (1988) categorized non-violent mate retention behaviors into five categories: Direct guarding, intersexual negative inducements, intrasexual negative inducements, public signals of possession, and positive inducements.

Because perceived female attractiveness is a source of variation in men's mate retention behaviors, it also might explain variation in the performance of other anti-cuckoldry behaviors, such as frequent IPC. Men who perceive their partner to be more attractive might perform IPC more frequently, to combat the greater risk of sperm competition associated with their partner's infidelity. We are unaware of research that has examined the relationship between perceived female attractiveness and IPC frequency. We investigated this relationship in a test of the first hypothesis:

**Hypothesis 1.** Men's perceptions of their partner's attractiveness will positively predict IPC frequency.

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## 1.2. Mediating role of perceived female attractiveness

Previous research has documented a positive relationship between IPC frequency and male mate retention behaviors (Shackelford, Goetz, Guta, & Schmitt, 2006). Furthermore, Goetz et al. (2005) documented a positive relationship between perceived female partner's attractiveness (as part of a composite variable assessing sperm competition risk) and men's mate retention behaviors. Because IPC frequency and female attractiveness are related positively to men's mate retention behaviors, female attractiveness may mediate the relationship between IPC frequency and mate retention behaviors. In other words, the relationship between IPC frequency and men's mate retention might vary with female attractiveness. Men who perceive their partner to be more attractive might perform concurrent anti-cuckoldry tactics such as more frequent mate retention behaviors and IPCs. We investigated this mediating relationship in a test of the second hypothesis:

**Hypothesis 2.** Men's perceptions of their partner's attractiveness will mediate the relationship between IPC frequency and men's mate retention behaviors.

## 2. Methods

### 2.1. Participants

Two hundred and seventy seven men, each in a committed, sexual relationship with a woman, participated in this study. Participants were drawn from universities and surrounding communities. The mean age of the participants was 24.9 years ( $SD = 7.0$ ), the mean age of the participants' partners was 23.6 years ( $SD = 6.4$ ), and the mean relationship length was 43.6 months ( $SD = 46.9$ ). Different subsets of this database have been used to conduct different analyses designed to test different hypotheses (Shackelford, Goetz, McKibbin, & Starratt, 2007).

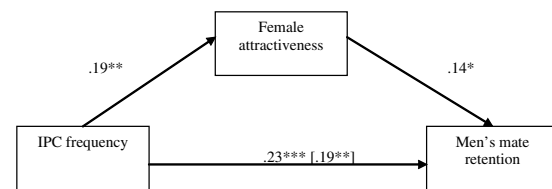
### 2.2. Materials

Participants completed a survey that included several sections. The first section solicited demographic information, including the participant's age, his partner's age, and the duration of his current relationship. The second section included four questions to assess men's perceptions of their partner's attractiveness: How physically attractive do you think your partner is? How physically attractive do other men think she is? How sexually attractive do you think she is? How sexually attractive do other men think she is? We recorded responses on a 10-point scale anchored by 0 (Not at all) to 9 (Extremely). To assess IPC frequency, participants were asked to indicate how frequently they have sexual intercourse with their partner in an average or typical week.

Participants also completed the mate retention inventory (MRI; Buss, 1988), which assesses the frequency of men's use of 104 mate retention acts in the past month, with responses ranging from 0 (never) to 3 (often). Example acts include, "Refused to introduce my partner to same-sex friends," "Read my partner's personal mail," and "Bought my partner a small gift."

### 2.3. Procedure

The prospective participant had to be (1) male, (2) at least 18 years of age, and (3) in a committed, sexual relationship with a woman. If these criteria were met, the researcher handed the participant a consent form, the survey, and a security envelope. The participant was instructed to read and sign the consent form, com-



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

**Fig. 1.** Summary of mediating regression analyses with  $\beta$  weights. The relationship between in-pair copulation (IPC) frequency and men's mate retention was reduced significantly after controlling for variance accounted for by men's perceptions of their partner's attractiveness. Female attractiveness partially mediates the relationship between IPC frequency and men's mate retention behaviors.

plete the survey, place the completed survey in the envelope, and seal the envelope.

## 3. Results

We constructed an overall mate retention composite score by averaging frequency reports for the 19 mate retention tactics ( $\alpha = .93$ ). We constructed a composite perceived partner attractiveness score by averaging responses to the four attractiveness items ( $\alpha = .84$ ). We conducted a regression analysis to test **Hypothesis 1**. Consistent with the hypothesis, men's perception of their partner's attractiveness predicted IPC frequency [ $\beta = .19, F(1,258) = 9.75, p < .01$ ].

We tested **Hypothesis 2** following Baron and Kenny's (1986) guidelines for mediation. First, the results of a regression analysis indicated that IPC frequency predicts men's mate retention behaviors [ $\beta = .23, F(1,250) = 13.66, p < .001$ ]. Second, the test of **Hypothesis 1** indicated that IPC frequency explained significant variance in perceived partner attractiveness. Third, we entered IPC frequency and perceived partner attractiveness into a regression analysis predicting men's mate retention behaviors. The model was significant [ $F(2,242) = 8.79, R^2 = .07, p < .001$ ]. Perceived partner attractiveness uniquely predicted variance in men's mate retention behaviors ( $\beta = .14, t = 2.28, p < .05$ ). Finally, we examined whether the relationship between IPC frequency and men's mate retention behaviors remained after controlling for perceived female attractiveness. The relationship remained but was reduced significantly [ $F$ -change (1,242) = 8.83,  $R^2$ -change = .034,  $p < .01$ ]. The  $\beta$  coefficient in the initial regression between IPC frequency and men's mate retention behaviors was reduced from .23 to .19 after controlling for partner attractiveness (see Fig. 1). The Sobel (1982) test verified that partner attractiveness was a significant but partial mediator of the relationship between IPC frequency and overall men's mate retention behaviors ( $z = 1.96, p < .05$ ).

## 4. Discussion

Consistent with **Hypothesis 1**, the results indicate a positive relationship between men's perceptions of their long-term partner's attractiveness and in-pair copulation (IPC) frequency. Thus, as indicated by the current results and consistent with previous research, both IPC frequency and men's mate retention behaviors vary with perceived partner attractiveness. Consistent with **Hypothesis 2**, the results indicate that perceived partner attractiveness partially mediates the relationship between IPC frequency and men's mate retention behaviors.

To address why men's perceptions of their partner's attractiveness mediates the relationship between IPC frequency and men's mate retention behaviors, we speculate that partner attractiveness is a proxy for recurrent risk of sperm competition, which in turn

explains the concurrent use of different anti-cuckoldry tactics. More attractive women are more likely to be approached for short-term, long-term, and extra-pair mateships (Buss, 1989; Buss & Schmitt, 1993; Li, Bailey, Kenrick, & Linsenmeier, 2002; Li & Kenrick, 2006; Regan, Levin, Sprecher, Christopher, & Cate, 2000). Hughes and Gallup (2003) documented that more attractive women are more likely to commit infidelity. Men mated to more attractive women therefore may be at greater recurrent risk of sperm competition. We speculate that men perform different behaviors to decrease the risk of cuckoldry, but as the recurrent risk of sperm competition increases, men perform more frequent IPCs and mate retention behaviors simultaneously.

According to Baron and Kenny (1986), “a given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion” (p. 1176; emphasis added). The results indicate that the relationship between the predictor (in-pair copulation) and the criterion (mate retention behaviors) is partially accounted for by the mediator (perceived attractiveness). Thus, the current study corresponds statistically to a mediation analysis but might be limited conceptually. We can only infer that the relationship between frequency of in-pair copulations and mate retention behaviors is accounted for by the mediator – perceived female attractiveness – but we cannot infer causality. Furthermore, we cannot infer causality because the data reflect single assessments. Future research using a methodology that includes repeated assessments over time may provide insight into the nature of the links between IPC frequency and men's mate retention behaviors.

The current research replicates conceptually previous results addressing the relationships between IPC frequency and men's mate retention behaviors (Shackelford et al., 2006) and between men's perceptions of their partner's attractiveness and men's mate retention behaviors (Goetz et al., 2005). Furthermore, the current research documents a relationship between perceived partner attractiveness and IPC frequency and provides evidence that female attractiveness mediates the relationship between IPC frequency and men's mate retention behaviors. Men who perceive their partners to be more attractive perform more frequent and concurrent anti-cuckoldry behaviors, including IPCs and mate retention behaviors.

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