



## Perceived threat of infectious disease and its implications for sexual attitudes

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### ABSTRACT

A study ( $n = 411$ ) investigated the relationship between chronic individual differences in germ aversion and sociosexual attitudes (short-term mating orientation, long-term mating orientation, and anticipated future sexual promiscuity), and also tested whether the magnitudes of these relations differ depending on the temporary perceptual salience of disease threat. Results revealed person-by-situation interactions. When the threat of disease was temporarily salient, germ aversion correlated negatively with short-term mating orientation and with future sexual promiscuity, and correlated positively with long-term mating orientation; these effects were either weaker or nonexistent under control conditions. These effects emerged most clearly among women

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### 1. Introduction

Attitudes towards casual sex differ greatly between individuals. Surveys have found that while a large proportion of men and women label themselves as comfortable monogamists, another significant proportion are comfortable having casual sex with many different partners (e.g. Laumann, Gagnon, Michael, & Michaels, 1994). These attitudes are emblematic of a distinction between *restricted* and *unrestricted* sociosexual attitudes, or between *long-term* and *short-term* mating styles (Jackson & Kirkpatrick, 2007; Simpson & Gangestad, 1991). Individual differences in long-term versus short-term mating styles have many implications. For instance, individuals who are dispositionally inclined toward a short-term mating style (i.e., are more inclined toward casual sex and multiple sexual partners) place higher priority on physical attractiveness when choosing a mate and exhibit reduced commitment to ongoing romantic relationships (Simpson & Gangestad, 1991).

Most research exploring the influences on sexual attitudes has focused on variables that are typically predictive of stable individual differences, such as differences in genetics and early life experiences (Garcia et al., 2010; Newcomer & Udry, 1987). Although long-term and short-term mating styles are relatively stable across time, and can be empirically assessed as trait-like individual differences (Jackson & Kirkpatrick, 2007; Simpson & Gangestad, 1991), these dispositions can also vary across time and circumstances

(Haselton & Gangestad, 2006; Pfeiffer, Verwoerd, & Davis, 1972; Pillsworth & Haselton, 2006). These findings suggest that attitudes regarding long- and short-term mating are predicted not only by enduring individual differences, but also by temporary contextual cues. In this article, we report results from an investigation testing whether long-term and short-term mating styles—including attitudes pertaining to sexual promiscuity—might be influenced by the perceived threat of infectious disease. These results address three questions: (1) Are these mating styles predicted by chronic individual differences in perceived vulnerability to disease? (2) Do these effects differ depending on the temporary salience of disease transmission? (3) Do these effects differ between men and women?

In recent years there has emerged a considerable literature on the subjective perception of threat posed by infectious diseases and its implications for affect, cognition, and behavior (Curtis, de Barra, & Aunger, 2011; Oaten, Stevenson, & Case, 2009; Schaller & Park, 2011). Trait-like differences exist in the extent to which individuals perceive themselves as vulnerable to disease transmission—as indicated by individuals' self-assessments of immunocompetence, the extent to which they avoid situations associated with germ-transmission, and in the extent to which they experience a disgust response when presented with such situations (Duncan, Schaller, & Park, 2009; Haidt, McCauley, & Rozin, 1994; Tybur, Lieberman, & Griskevicius, 2009). These individual differences are correlated with a variety of traits and attitudes implying behavioral caution and attitudinal conservatism. Chronic germ aversion, for instance, correlates negatively with extraversion and openness to experience, and correlates positively with conformist attitudes (Duncan et al., 2009; Murray & Schaller, 2012; Wu & Chang, 2012).

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These relations can be understood as reflecting tradeoffs in an implicit cost-benefit analysis. Specific behavioral dispositions may have specific benefits, but can have disease-relevant costs as well. The ratio of benefits to costs varies depending upon the magnitude of threat posed by pathogen infection. Extraversion provides an illustrative example. Extraverted behavior is associated with social benefits (e.g., greater opportunities for social support); but, by exposing individuals to a larger number of people (who may be carriers of infectious diseases), extraversion is also associated with higher risk of pathogen infection (Hamrick, Cohen, & Rodriguez, 2002). The perceived magnitude of these costs is implicitly exaggerated for individuals who chronically perceive pathogens to pose a greater threat. To the extent that behavioral dispositions are responsive to implicit benefit/cost analysis, it follows that extraversion is likely to be lower among individuals who are chronically more germ-averse—and that is exactly what empirical results reveal (Duncan et al., 2009).

The predictive effects of chronic individual differences are complemented by—and sometimes moderated by—the effects of contextual cues that make the threat of disease transmission temporarily salient. Under experimental conditions in which the possibility of disease transmission is temporarily salient, people report lower levels of extraversion and higher levels of conformist attitudes (Mortensen, Becker, Ackerman, Neuberg, & Kenrick, 2010; Murray & Schaller, 2012; Wu & Chang, 2012). In addition, individual differences in perceived vulnerability to disease predict specific behavioral dispositions more strongly under conditions in which the threat of disease transmission is temporarily salient (Duncan & Schaller, 2009; Mortensen et al., 2010). These person-by-situation interactions are consistent with additional findings suggesting that individual differences in sensitivities to specific kinds of threats may predict relevant attitudes especially strongly under conditions in which cues connoting that particular kind of threat are perceptually salient (e.g., Schaller, Park, & Mueller, 2003).

The cost/benefit logic that links disease threat to extraversion and other behavioral attitudes can also be applied within the specific domain of sexual behavior. There can be interpersonal or hedonistic benefits associated with promiscuous sexual behavior, but unrestricted sexual behavior also has disease-specific costs. Sexual activity entails intimate interpersonal contact and thus carries with it a risk of disease transmission; indeed, many infections are transmitted almost exclusively through sexual contact. Consequently, unrestricted sexual behavior is associated with increased risk of contracting infectious diseases (Halperin & Epstein, 2004; Morris & Kretzschmar, 1997). The perceived magnitude of this cost is likely to be implicitly exaggerated among people who feel more vulnerable to disease transmission. It follows that individuals who feel more vulnerable to disease will be less inclined toward promiscuous short-term mating, and instead favour a long-term mating strategy (which implies relatively fewer lifetime sexual partners).

Preliminary evidence is consistent with this hypothesis. Duncan et al. (2009) reported correlations between two subscales of a Perceived Vulnerability to Disease questionnaire (PVD) and a Sociosexual Orientation Inventory (SOI; Simpson & Gangestad, 1991). Results revealed a weak correlation between SOI and PVD-Perceived Infectability ( $r = -.14$ ) and a stronger correlation between SOI and PVD-Germ Aversion ( $r = -.28$ ). A limitation of these results, however, is that the SOI questionnaire employed by Duncan et al. (2009) treated long- and short-term mating styles as opposite ends of a unidimensional continuum. Mating styles may be more accurately considered as conceptually distinct, context-contingent strategies (Gangestad & Simpson, 2000). Consistent with this conjecture are results showing that long- and short-term mating are somewhat orthogonal, and can be measured

as distinct constructs (Jackson & Kirkpatrick, 2007). It remains to be tested whether individual differences in perceived vulnerability to disease primarily predicts attitudes specific to long-term mating, short-term mating, or both.

Another question that remains unanswered is whether any predictive effects of these individual differences might be moderated by the specific context within which mating orientations are assessed. Mortensen et al. (2010) found that it was primarily under conditions in which infectious disease was highly salient that chronically higher levels of perceived vulnerability to disease predicted lower levels of extraversion and openness to experience. Such a person-by-situation interaction may predict reported sexual attitudes as well.

Also unknown is whether there might be sex differences in the magnitude of relations between disease threat and attitudes toward long- and short-term mating. Men tend to be approach-oriented in the domain of sexual behavior, whereas women are more risk-averse (Haselton & Buss, 2000). One well-documented implication is that, compared to women, men are generally more attitudinally inclined toward short-term mating behavior (Schmitt, 2005). A less obvious implication is that, compared to men, women may be more sensitive to information implying increased costs associated with promiscuity—including the increased risk of disease-transmission. This implies the possibility that any relation between disease threat and mating orientation may be observed more strongly among women.

Some prior evidence is obliquely consistent with such a sex difference: In an analysis of nation-level mean values of pathogen prevalence and sexual attitudes, Schaller and Murray (2008) reported that in nations characterized by higher levels of disease-causing pathogens, people reported attitudes endorsing more restricted (i.e., less promiscuous) sexual behavior, and this effect emerged most strongly in the prediction of female attitudes. However, these results focused on ecological variation in pathogen prevalence (rather than perceived vulnerability to pathogens) predicting nation-level (rather than individual) sexual attitudes; no prior results have evaluated whether the hypothesized effects of perceived disease threat on short- and long-term mating attitudes might differ between the sexes.

### 1.1. Overview of the present investigation

Below we report the results from analyses on data obtained from young adults. All participants completed measures designed to assess perceived vulnerability to disease, as well as a revised version of the SOI, which independently assesses long- and short-term mating orientation. In addition, shortly before completing the revised SOI questionnaire, some participants were exposed to an experimental procedure designed to make the threat of disease temporarily salient. The experimental manipulation allowed us to test whether relations between PVD subscales and mating orientations were moderated by the temporary perceptual salience of the threat posed by disease transmission.

Two distinct versions of the disease threat manipulation were employed across two separate samples. We combined results across these two samples, and conducted primary analyses on the combined dataset. We did so for three main reasons. First, although procedurally different, the two manipulations were designed to serve a conceptually identical function. Second, previous experiments employing these manipulations have shown that they do produce conceptually identical effects on common outcome variables (Murray & Schaller, 2012; Wu & Chang, 2012). Third, by combining data across the two samples, we increased statistical power to detect sex differences and to test for effects within each sex separately. Statistical power was of special concern here because there was a relative paucity of men in the population from

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