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TITLE: Extending parasite-stress theory to variation in human mate preferences

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ABSTRACT

Here we suggest that Fincher and Thornhill's parasite-stress theory of social behaviors and attitudes can be extended to mating behaviors and preferences. We discuss evidence from prior correlational and experimental studies that support this claim. We also reanalyze data from two of those studies using Fincher and Thornhill's new parasite stress measures.

MAIN TEXT

Parasites, and the arms races between parasites and other organisms, have long been associated with theories of sexual selection because organisms benefit from choosing parasite free and parasite resistant mates (e.g., Hamilton & Zuk, 1982). With rising parasite load, organisms should channel their energies away from display to fight parasites and so may be less able to invest in attractive traits (Folstad & Karter, 1992). Because parasites are generally detrimental to health and survival, high parasite load increases the importance of selection of mates who possess traits indicating resistance to parasites and so we can predict that relative parasite stress will affect human preferences for traits associated with health and disease resistance.

In humans, several previous studies have reported positive correlations between various measures of parasite stress and preferences for putative cues of long-term health, suggesting that individuals place greater emphasis on potential mates' health cues in regions where pathogens impose a greater selection pressure (Gangestad & Buss, 1993; Low, 1990). For example, in a study of 29 cultures, Gangestad, Haselton and Buss (2006) observed positive correlations between a measure of pathogen prevalence and the importance placed on potential mates' physical attractiveness, health and intelligence.

Human faces contain several potential cues to parasite resistance and have been the focus of much research in attractiveness (e.g., Thornhill & Gangestad, 1999). A recent study of 30 Westernized countries showed that regional differences in women's preferences for

masculine traits in men's faces, a cue of men's long-term health (Thornhill & Gangestad, 2006; Rhodes et al., 2003), were correlated with a potential proxy measure for parasite stress: a composite health measure derived from various World Health Organization statistics on mortality and life expectancy (std $\beta = -.515$, $t = -3.18$, $p = .004$; DeBruine et al., 2010). The relationship between women's masculinity preferences and this health measure remained even after controlling for regional variation in wealth and mating strategies (DeBruine et al., 2010) or controlling for homicide rates (DeBruine et al., 2011), a potential indicator of intrasexual competition (Brooks et al., 2011). A similar correlation (std $\beta = -.478$, $t = -3.77$, $p < .001$) was also observed in a US sample using a composite health measure derived from US Center for Disease Control statistics on mortality due to illness and disease across 50 states, even after controlling for regional variation in wealth, income inequality, fertility and homicide rates (DeBruine et al., 2011). These data indicate that women in regions with lower health exhibit stronger preferences for facial secondary sexual traits associated with long-term health in male faces.

Here, we have re-analyzed both samples of data using Fincher and Thornhill's measures of parasite stress. Linear regression using the weighted least squares (WLS) method to control for number of participants per country showed that, across countries, there was a significant positive relationship between parasite stress and women's preferences for masculine men (std $\beta = .654$, $t = 4.58$, $p < .001$). Using the same analysis, across US states, a significant positive relationship was also observed between these variables (std $\beta = .443$, $t = 3.43$, $p = .001$). These reanalyses show that Fincher and Thornhill's parasite stress measures generate the same results as our previously used composite health measures; parasite stress predicted regional variation in women's preference for male facial masculinity in a nearly identical way to the health measures. Indeed, our health measures and these parasite stress measures were highly correlated in both samples of 30 Westernized countries ($r = -.880$, $p < .001$) and 50 US states ($r = -.668$, $p < .001$).

Although many studies have implicated pathogen stress in regional variation in behavior, the correlational nature of these studies and the large number of covarying ecological factors mean that it is not possible to draw firm conclusions about the effects of pathogen stress on behavior (Brooks et al., 2011; DeBruine et al., 2011; Little, DeBruine & Jones, 2011). Fincher and Thornhill address this limitation of correlational studies by noting experimental research in which viewing cues to disease salience affected behavior in ways predicted by their parasite-stress theory of social behavior, while viewing control images did not (e.g., Mortensen et al., 2010). Similarly, we have also found that viewing cues to disease salience increased preferences for facial cues of long-term health in potential mates, but not same-sex individuals (Little, DeBruine & Jones, 2011).

Collectively, these correlational and experimental findings, together with our new analyses, suggest that Fincher and Thornhill's parasite-stress theory of social behaviors and attitudes can be usefully extended to understand regional variation in mating behaviors and preferences, further underlining the importance of pathogens in shaping human behavior.

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