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Short Communication

Domain-specificity and individual differences in worry

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ABSTRACT

Worrying is generally perceived to be an undesirable mental state. An evolutionary approach suggests, however, despite the potential distress, worry may function to focus individuals' attention on evolutionarily-relevant tasks. In the current study ($N = 193$), we demonstrated that participants' primary worries were focused within domains central to reproductive success and mate-value. Furthermore, mating strategy predicted worries in the domains of social status and mating. Neuroticism, as an individual difference reflecting vigilance to threats, was correlated with worry about fitness-relevant but not fitness-irrelevant domains. The current study documents the first domain-specific assessment of worries and complements this analysis with intriguing individual difference predictors of worry.

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1. Introduction

Some of the most uncontroversial claims in evolutionary psychology concern fear adaptations (Öhman & Mineka, 2003) and anxiety (Marks & Nesse, 1994). For instance, fears of snakes and spiders represent recurrent and potentially dangerous encounters that have shaped fear mechanisms to make these dangers "pop out" in perception (Rakison & Derringer, 2008). In the present study, we examined domains of worry relative to an array of individual differences. We argue that domain-specific worries function as subtypes of general anxiety that provide a selective advantage when confronting specific dangers (Marks & Nesse, 1994) and are likely akin to "daily hassles."

Domain-specificity is a heuristically valuable and theoretically powerful way to generate testable hypotheses (Buss, 2009). It is based on the idea that natural selection has shaped different psychological mechanisms to solve distinct adaptive tasks. Domains refer to categories of adaptive problems (e.g., mate attraction, mate retention, reproduction). For example, the visual cortex is well designed to process visual information, we seem to have very specific cheater-detection mechanisms (Cosmides, 1989), just to name a few. This perspective is most commonly countered by domain-general, "rationality" explanations (e.g., Harris & Christenfeld, 1996), but these explanations fail for a number of reasons including failure to predict (Confer et al., 2010). The researchers often rationalize the findings of evolutionary psychologists with socio-

cultural/feminist models. Part of the predictive power of evolutionary psychology is based on the fact that adaptationist predictions are domain-specific. In the current study, we compared multiple domains of worry hypothesized to be fitness-relevant or fitness-irrelevant.

Worrying focuses the mind on a particular problem and causes an aversive psychological state; presumably this functions to focus attention on the problem at hand to provide multiple solutions for assessment while simultaneously motivating the individual to solve the problem and ameliorate the psychological pain (Deffenbacher, 1978). For example, losing one's position in a social hierarchy can lead to costly outcomes (Baumeister, 2005). In contrast, irrational, fitness-irrelevant concerns (i.e., the order of objects, the symmetry of objects, counting objects, and particular numbers) may cause some worry, but they should not be primary concerns. We expect worry to be stronger in fitness-relevant (e.g., mating, social status, physical health, and kinship) than in fitness-irrelevant domains (i.e., irrational worries).

Individual differences in a person's vigilance to threats or degree of worry can be seen in rates of neuroticism (Nettle, 2006). Although there are negative side effects associated with high neuroticism (e.g., mood disorders, divorce), it may still provide benefits in terms of mitigating fitness-relevant threats. However, if neuroticism is part of an evolved suite of traits that allow people to solve adaptive tasks it should be unrelated to irrational worries. Such threats would not activate the cognitive systems shaped over evolutionary time to deal with threats to one's fitness. Therefore, we predicted that individuals scoring high on neuroticism would still worry about mating, status, kinship, and physical threats but not irrational threats.

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Individuals have cognitive systems that serve their adaptive needs (Marks & Nesse, 1994) and one such need is reproduction (Buss & Schmitt, 1993). Individual differences with regards to mating strategies should be correlated with level of worry about the mating domain. Those with a short-term mating strategy (i.e., sociosexually unrestricted) may gain more in terms of fitness than more sociosexually restricted men by greater vigilance to mating-related concerns. Social status confers greater access to mates (Buss & Schmitt, 1993) and thus, those pursuing a short-term mating strategy would benefit by being vigilant over their social status. Another important individual difference is mate-value: individuals who believe they embody highly desirable traits may not worry as much about mating or status-relevant concerns. These individual differences relevant to reproduction should not necessarily be relevant within the other domains and should not predict worries about kinship, physical threats, or fitness-irrelevant concerns.

2. Methods

2.1. Participants and procedures

Participants ($N = 193$; 43 men, 150 women) aged 17–34 ($M = 18.78$, $SD = 1.76$) from a large public university in the Southern US participated in a large online study in exchange for partial course credit. Of the participants, 119 were single and 74 were in a romantic relationship. The sample was predominantly White (44%), 24% were Hispanic, 16% were East Asian, 8% were Black, and 8% indicated “Other ethnicity.” Any participants who reported a personal history of psychological illnesses, such as depression, were excluded ($n = 12$). Participants were debriefed at the end of the survey.

2.2. Measures

2.2.1. Worry questionnaire

For the current study, the researchers created an instrument to assess worry in five domains: mating, social status, kinship, physical threats, and irrational worries (complete instrument available from first author upon request). For each worry, participants indicated how often they worried about that particular item (1 = *never*; 7 = *all the time*). Worry about physical threats ($M = 3.07$, $SD = 0.80$) was assessed with 21 items (e.g., your general health, your personal safety, that someone will physically harm you). Worry about social threats ($M = 3.99$, $SD = 0.98$) was assessed with 20 items (e.g., someone taking advantage of you, someone spreading rumors about you, public speaking). Worry about family members ($M = 4.41$, $SD = 1.65$) was assessed with four items (i.e., mother, father, brother, sister). Irrational worry ($M = 2.20$, $SD = 1.31$) was assessed with four items (i.e., the order of objects, the symmetry of objects, counting objects, particular numbers). Those participants who reported they were currently in a romantic relationship completed an additional set of questions concerning worries related to their mateship ($M = 2.98$, $SD = 0.90$). Participants indicated how often they worried about 20 items (e.g., partner's sexual potency, partner cheating, partner being jealous). Items for each of these domains of worry were averaged to create indexes (Cronbach's α s = .85–.90).

2.2.2. Personality measures

Sociosexuality (Penke & Asendorpf, 2008) was measured in three subscales with three items each: behaviors ($\alpha = .86$; $M = 1.43$, $SD = 2.63$), attitudes ($\alpha = .86$; $M = 7.54$, $SD = 5.71$), and desires ($\alpha = .89$; $M = 8.62$, $SD = 5.80$). The behaviors subscale assesses actual short-term mating behavior, the attitudes subscale assesses the individual's attitudes about short-term mating in general, and

the desires subscale assesses the individual's actual interest in engaging in short-term mating.

We measured mate-value using the MVI-19 scale (Kirsner, Figueredo, & Jacobs, 2003) which asks participants to indicate how individuals who know them well would rate them on 19 characteristics ($-3 = \textit{extremely low}$; $3 = \textit{extremely high}$). These items were summed as an index of participants' mate-value ($\alpha = .85$; $M = 106.82$, $SD = 0.90$), with higher scores indicating higher mate-value.

To measure the Big Five personality traits, we used the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003). Two items assessed each of the Big Five factors, with one of each pair being reverse-scored. Estimates of internal consistency returned low rates: extraversion ($\alpha = .85$; $M = 8.53$, $SD = 3.01$), agreeableness ($\alpha = .57$; $M = 10.12$, $SD = 2.15$), conscientiousness ($\alpha = .21$; $M = 10.92$, $SD = 2.22$), emotional stability ($\alpha = .44$; $M = 9.75$, $SD = 2.47$), and openness ($\alpha = .24$; $M = 10.67$, $SD = 2.03$) as expected in short-scales (Kline, 2000).

3. Results

Table 1 contains the correlations between the mating and personality individual difference measures and five domains of worry. Worry about physical threats was positively correlated with neuroticism. Worry about social threats was positively correlated with sociosexual desires, conscientiousness, and neuroticism, and negatively correlated with mate-value. Worry about kin members was positively correlated with neuroticism. Worry about irrational threats was not correlated with mating measures or the Big Five. For individuals in a romantic relationship ($n = 74$), worry about mating threats was positively correlated with the three sociosexuality subscales and negatively correlated with agreeableness and neuroticism.

We found only one case for significant moderation by participant sex. Agreeableness was more strongly (Fisher's $z = 1.69$, $p < .05$) correlated with worries about mating threats in men ($r = -.66$, $p < .05$) than in women ($r = -.18$). There was no other evidence for moderation by the sex of the participant.

We then compared the domains of worry to one another in a repeated-measures ANOVA with the domains of worry as a within-subjects factor and sex of the participant as a between-subjects factor. The interaction term was not significant ($F = 1.81$, $\eta_p^2 = .03$), nor was there any evidence of sex differences ($F = 0.00$, $\eta_p^2 = .00$), but we found a main effect of worry across the domains ($F(4, 165) = 40.85$, $p < .01$, $\eta_p^2 = .43$). The descriptive statistics for each domain can be found in Section 2.2.1. Using Bonferroni corrections for multiple comparisons, we found that individuals worried significantly more about social status, physical health, and kin than irrational fears ($ps < .01$). Individuals worried less about physical threats than kin and social status threats ($ps < .01$). Although mating-related worries were only assessed for a subset of the sample, these worries were rated similarly to physical threats, slightly greater than irrational fears, and slightly less than social or kin threats.

4. Discussion

In the present study, we adopted a domain-specific perspective to examine the content of worries. We argued that worry functions to focus a person's attention toward evolutionarily relevant threats in a similar manner as fears, phobias (Rakison & Derringer, 2008), and anxieties have been hypothesized to do (Marks & Nesse, 1994). If worry has an adaptive value, we would expect people to worry most about threats to their inclusive fitness. We found the primary worries of individuals revolved around status and mating threats

Table 1
Zero-order correlations between domain-specific threats and measures of mating and personality.

	Mating measures				Big Five				
	SOI-B	SOI-A	SOI-D	MVI	E	A	C	N	O
Physical threats	.01	.09	.07	.02	-.02	-.14	-.09	.26**	.04
Social threats	.10	.14	.22*	-.23*	-.08	-.18	.21*	.41**	-.00
Kin threats	.10	.06	.18	.14	-.04	-.06	-.06	.19 ^a	.02
Irrational threats	-.00	.06	.07	-.07	-.08	-.09	.04	.08	.02
Mating threats	.29*	.33**	.28**	-.15	-.17	-.29*	-.14	-.36*	-.08

Note: SOI-B is sociosexual behaviors, SOI-A is sociosexual attitudes, SOI-D is sociosexual desires, MVI is mate-value, E is extraversion, A is agreeableness, C is conscientiousness, N is neuroticism, O is openness. Correlations for mating threats were assessed for those who were in a romantic relationship ($n = 74$).

^a Correlation for worry about brothers only.

* $p < .05$.

** $p < .01$.

and that worries about abstract things, such as numbers and symmetry, were least frequent. Despite its distressing nature, worrying may be an adaptive cognitive system designed to operate in a domain-specific fashion.

Perhaps the most intriguing findings centered on the predicted individual differences in worrying. Within the full sample, individuals with less restricted sociosexual desires worried more about social status; in addition, within the sample of mated participants, every component of sociosexuality was positively correlated with worries in the mating domain. These findings are consistent with our hypothesis that individuals oriented more toward short-term mating would be more vigilant to threats to aspects of their lives affecting their mating success: namely social status and mates. The negative correlation between mate-value and social status worries was consistent with this interpretation as well. Surprisingly, mate-value was not correlated with mating concerns, but this may be because of the limitation that only mated participants were assessed on mating-related worries whereas single individuals may be even more concerned with status in order to obtain a mate in the first place. Last, neuroticism, which may represent an individual's tendency to be vigilant to threats, was exclusively correlated with evolutionarily-relevant threats and not evolutionarily-neutral ones. Only an evolutionary perspective would predict such a result; traditional theories of neuroticism imply that it is a trait which operates across domains (see Nettle, 2006). In particular, within kin-related threats, it was worry about brothers that was correlated with neuroticism. Perhaps this is because young men have historically been the family members most likely to face danger (Wilson & Daly, 1985) and thus most in need of kin-based vigilance, a speculation that could be tested in future studies.

4.1. Limitations and future directions

Our goal was to present an exploratory overview of the domain-specific approach to worry which meant using multiple brief instruments. In particular, the TIPI scale may attenuate correlations to the point of becoming undetectable. Although we did not predict any effects with openness and conscientiousness, correlations may still be present and detectable with longer, content-rich, sensitive, and comprehensive measures of the Big Five. Our worry measures, although high in face-validity and internal consistency, were author-generated and have not yet been validated. Future research could validate a domain-specific measure of worry based on our instrument. The domains of worry assessed likely consist of numerous subsets of threats that could be fruitfully considered separately. For instance, mating threats are likely comprised of many smaller threats that may themselves be individually correlated with specific individual differences: some individuals may worry more about their ability to conceive offspring; others may

worry more about finding a mate. Specific individual differences in factors such as sex, social status, age, could be predicted in advance using an evolutionary perspective. Another limitation was that our measure of mate-value was self-report and thus subject to self-enhancement biases. Future studies could incorporate other-rated mate-value to verify our results. Last, we only assessed mating worries for mated individuals which may have provided us with an underpowered test. Future research should incorporate measures of mating worries that can be equally assessed for mated and unmated individuals.

5. Conclusions

Worry is an aversive state; however, an evolutionary perspective shows that even aspects of our psychology that seem painful may actually improve our reproductive success (Nesse, 1991). Individuals can worry about a nearly infinite number of things, but only those threats that could affect inclusive fitness should weigh heavily in their concerns. Our study showed that people worry most about evolutionarily relevant threats and least about evolutionarily novel threats – even among neurotic individuals already prone to excessive worry. As predicted, individual differences interacted with domains of worry in accordance with cognitive biases that facilitate increased inclusive fitness. The current study has documented that worry, like fear and anxiety, may represent an ancient adaptive solution to the problem of everyday threats and shows similar hallmarks of adaptive design in its domain-specificity. In short, worry is a proximal stimulus for adaptive behavior.

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