Original Article

Is risk taking used as a cue in mate choice?

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Abstract: More frequent risk taking among young men than women has been explained as a sexually selected trait, perhaps advertising male quality. We investigated this hypothesis in three studies. (1) Young men and women rated how attractive they would find it if a potential partner took various specific risks. A domain-specific risk inventory allowed us to distinguish whether risk taking is attractive generally or only in certain domains. Both sexes reported social and recreational risk taking as attractive (the latter not always significantly so), but other domains of risk taking as unattractive (ethics, gambling, and health) or neutral (investment). The sexes differed markedly little. Parallel studies in Germany and the United States yielded very similar results. (2) We asked subjects to predict how attractive the other sex would find it if the subject performed each risky behavior. Both sexes were rather accurate (which could be merely because they assume that the other sex feels as they do) and sex differences in attractive risk taking are not explicable by sex differences either in attraction or in beliefs about what others find attractive. However, our data could explain why unattractive risks are more often taken by men than women (men slightly underestimated the degree of unattractiveness of such risks, whereas U.S. women overestimated it, perhaps because they themselves found such risk taking more unattractive than did U.S. men). (3) Both members of 25 couples reported their likelihood of engaging in specific risky behaviors, their perception of these risks, and how attractive they would have found these behaviors in their partner. One hypothesis was that, for instance, a woman afraid of heights would be particularly impressed by a man oblivious to such risks. Instead we found positive assortment for risk taking, which might be explained by a greater likelihood of encountering people with similar risk attitudes (e.g. members of the same clubs) or a greater compatibility between such mates. Finally, contrary to the assumption that taking a low risk is likely to be less revealing of an individual's quality than taking a high risk, we found a strong negative

relationship between the perceived riskiness of a behavior and how attractive it was judged.

Keywords: Risk taking, domain specificity, sexual selection, mate choice, risk perception.

Introduction

Human risk taking shows some striking sex differences, which, when viewed in the framework of evolutionary theory, raises the possibility that it is a sexually selected trait. Males in their teens and twenties not only are more prone than females of the same age to take risks of many different kinds (e.g. extreme sports, driving cars or motorcycles too fast, binge drinking, having unprotected sex, etc.), but also suffer from much higher associated mortality rates (Byrnes, Miller, and Schafer, 1999; Kruger and Nesse, 2004). Many of these risks not only involve an increased variance in payoff (a standard definition of risk), but also often lead to a lower mean payoff than not taking the risk.

Sexual selection can provide a twofold rationale for why males show these risky behaviors, especially at ages of high fertility. First, the variance and skew in male mating success may favor risk taking: High potential gains (e.g. in resources promoting partner acquisition) outweigh the high risks (e.g. Daly and Wilson, 1988, chapter 8). Second, and the argument that this paper tests, males may take risks as a form of advertisement of their quality to both females and rival males. The argument for why risk taking might be an honest indicator of quality follows the logic of the handicap principle (Zahavi, 1975; Grafen, 1990): If risky behaviors are less of a danger to a high-quality male than to a low-quality male, high-quality males can afford to take such risks more often, and thus rivals and potential mates should use risk taking as a cue to quality.

Although such predictions about risk taking are typically found in textbooks of evolutionary psychology (e.g. Barrett, Dunbar, and Lycett, 2002, chapter 5), little research has investigated these claims empirically. Some studies have examined how competition between men can lead to risk taking (e.g. Wilson and Daly, 1985; Fetchenhauer and Rohde, 2002), but very few have considered the idea of risk taking as a signal. Kelly and Dunbar (2001) explored whether acts of bravery and a tendency toward risk taking are seen as an indicator of mate quality by women. In a study varying multiple male personality traits expressed in short text vignettes, they showed that women rated bravery (risk taking) as significantly more attractive than non-bravery, but only in short-term sexual partners, not partners that they might live with. They claimed also that women preferred short-term partners that were voluntarily brave over those that engaged in risks as part of their job (e.g. firefighters), but this does not agree with the mean scores that they reported.

Bassett and Moss (2004) also found that the preference for a high risk taker over a low risk taker was lower in the context of long-term relationships than short-term interactions. Unfortunately "engaging in casual sex" was one of the risky activities that determined the three personalities that subjects compared; this might very plausibly dominate how desirable someone is as a short-term or long-term partner for reasons other their more general propensity to take risks.

Taking Kelly and Dunbar's (2001) approach further, Farthing (2005) tested whether men and women desire physical risk takers as potential mates. Subjects read scenarios about specific risks and then judged the relative attractiveness of people taking the risk or avoiding it. Farthing found that subjects had a preference for the takers of a physical risk only if it was "heroic", that is it included an altruistic component (e.g. saving someone from drowning in a river, or intervening in an unfair fight). However that means that it might have been only the altruism and not the risk taking that was attractive. Farthing argued that heroism is an attractive feature to potential mates because "a male who takes such altruistic risks for the sake of other people or their children would undoubtedly do the same thing for his mate and her children" (p. 180). He also argued that non-heroic physical risk taking (e.g. engaging in risky sports or defending oneself against a mugger) is unattractive because it increases the likelihood of harm to the risk taker and thus might decrease the ability to care for his or her family. Another component of his study was to investigate what risk taking was attractive in selecting a same-sex friend, and here non-heroic physical risk taking was slightly attractive for men, but slightly unattractive for women. (Farthing's study was run independently at the same time as ours, and there is a partial match in the questions that he and we address.)

Anthropologists have suggested that not only is male hunting of large game part of men's subsistence contribution, but that taking the personal risk of hunting (e.g. injury from prey) may also have evolved as a competitive display (Hawkes and Bliege Bird, 2002). Bliege Bird, Smith, and Bird (2001) explored foraging choices, time allocation, and food sharing strategies among Meriam foragers in Australia. They proposed that some foraging activities (i.e. turtle hunting) may signal dimensions of mate quality that go beyond the mere acquisition of resources: Male foragers can advertise their physical quality, including strength and agility, and their willingness to take risks. This may lead successful Meriam hunters to benefit from higher social status and increased mating success (see also Smith, Bliege Bird, and Bird, 2003). However, with these studies it is difficult to tell whether it is the degree of risk taking rather than mere foraging success (or the display of other physical or cognitive skills) that makes successful hunters more attractive.

There exists to our knowledge only this handful of psychological and anthropological studies that focus on the idea that risk taking might signal important cues in human mate choice. The purpose of the present paper is to extend our understanding of the possible signaling functions of risk taking and in particular of whether the attractiveness of risky behaviors depends on the activities' domain.

There are three components to our investigation. First, expanding on the study of Kelly and Dunbar (2001), we tested whether each sex finds various sorts of risky behavior attractive when performed by the other. Second, we asked a different set of subjects how attractive it would be to the opposite sex if they were to perform various risky behaviors. Differing beliefs in what is attractive to others might drive sex differences in behavior even if the beliefs are erroneous. In these two studies, however, what subjects reported as attractive in surveys need not be an important component of mate choice in the real world. So our third study tested whether these preferences predict the match in attitudes toward risk taking of partners in stable relationships. We asked both members of each couple what risk taking they would have found attractive in their partners when they were courting and their own attitudes toward taking such risks

themselves. Before we detail these three studies, the next section introduces the specific kinds of risk considered.

Domain-specific risk taking

Because of individual differences in skills and abilities, we expect individuals to differ also in their assessments of risk in particular domains and consequently in the risks that they take. This is in contrast to standard psychological approaches that designate people as generally risk seeking or risk averse (Zuckerman and Kuhlman, 2000), but in accordance with recent research that suggests risk taking should be studied from a domain-specific perspective (Blais and Weber, 2001; Weber, Blais, and Betz, 2002; Hanoch, Johnson, and Wilke, 2006).

How to assess risk propensity adequately is still hotly debated. The two most prominent approaches to studying risk taking within the field of psychology—personality measures assessed by questionnaires and behavioral decision-making experiments—suffer from limitations: General personality traits such as sensation seeking (e.g. Zuckerman, 1994) do not provide an explanation for differential risk taking across domains (e.g. a mountain climber who buys fire insurance; Schoemaker, 1990), while the choices between monetary gambles studied in behavioral decision making have not been shown convincingly to extend to other risk domains (Blais and Weber, 2001) or to behavior outside of the laboratory (Huber, 1997). Recently, Weber, Blais, and Betz (2002) overcame these limitations of both approaches by developing a new psychometric instrument to distinguish risk-taking attitude and behavior in different domains; these scores correlate with the frequency of engagement in common risky behaviors outside of the laboratory (see also Hanoch et al., 2006). They found that risk taking in different domains showed only small to medium between-domain correlations, supporting the idea of domain-specific attitudes toward risk. In the present paper, we use both an English and a German version of this domain-specific risk-attitude scale (Weber et al., 2002; Johnson, Wilke, and Weber, 2004). We consider six distinct domains of risk taking: recreation (e.g. playing physical sports), ethics (e.g. cheating or stealing), gambling (e.g. betting in a casino), investment (e.g. buying stocks), health (e.g. smoking or drinking), and social (e.g. arguing for unpopular issues). Details are given in the Appendix.

Farthing (2005) also examined risk taking in different domains by asking about attitudes toward risk taking in a set of scenarios. His four domains (heroic, physical, drug, and financial) were specially constructed to test his hypotheses and so only partially match the domains that we took from the preexisting instrument. The closest matches are between his physical risk taking and our recreational risk taking (3 of Farthing's 10 physical risks involve sport; taking on a mugger is a non-sport example), and between his drug domain and some items in our health domain. Farthing's financial domain involves only three items, overlapping our gambling and investment domains. We did not consider the altruistic behaviors that define Farthing's heroic risk-taking domain; these also were physical risks, but not recreational.

Study 1: What risk taking is attractive in the opposite sex?

As described above, earlier work has assumed that risk taking is generally attractive and has cited the handicap principle as an adaptive explanation for why this

might be the case (e.g. Kelly and Dunbar, 2001; see also Farthing, 2005). As an example, consider physical traits such as strength, fitness, coordination, and athleticism. These have obvious survival value, so we might expect them to be attractive to the other sex, as has been shown in other studies (Barber, 1995; Faurie, Pontier, and Raymond, 2004). Of our six risk domains, risk taking in the recreational domain seems most likely to signal such physical traits. The argument here is that voluntarily taking physical risks will only make sense (both for the performer, and in an evolutionary sense) if the chance of failure is not too high, so that the expected benefits outweigh the expected costs. So only physically more athletic men, who are less likely to fail, and perhaps could recover more quickly if they did, can afford to perform riskier behaviors. Hence, behaviors involving physical risks could be an honest signal of the performer's athletic quality, and thus women should utilize them to select a mate who is best able to care for her and her children (Buss, 2004).

Further information about quality can be obtained from observing whether the risk taking succeeds (e.g. whether a man succeeds in jumping the stream may be at least as informative as whether he takes the risk) or how calmly the performer behaves while in a crisis. In this sense risk taking could be an example of what biologists call an amplifier trait (Hasson, 1991). Our questions try to exclude this component of the signal by giving no information about whether the risk taking was successful. However, with a few items success might be inferred just from the presumption that the potential mate is still alive.

Risk taking should not be attractive if it does not signal mate quality. Whereas some forms of risk taking might well be attractive because they can only be performed by high-quality individuals, other forms of risk taking might actually show no correlation with quality or even worse, be a sign of low quality. The latter is in accordance with theories of risk-sensitive foraging in which a risky behavior only makes sense if the animal is in such a bad energetic state that gambling on a risky option is its only hope of survival (Stephens, 1981; McNamara and Houston, 1992; Rode, Cosmides, Hell, and Tooby, 1999). Under these conditions risk taking should be viewed by others as unattractive since it is low-quality individuals that do it. Potentially, if there were additional cues to quality, risk taking by an apparently low-quality individual would make him even more unattractive, whilst the same risky behavior taken by an apparently high-quality individual would be attractive.

As an illustration of the general caveat we see in making predictions about whether risk taking is attractive, consider a young man playing at a roulette table surrounded by potential mates. Is placing a large bet in the casino a sign that he has lots of money that he can afford to waste (i.e. attractive)? Alternatively, if he has a gambling habit, the behavior might be an unreliable cue to future wealth (i.e. no correlation), or even an indication that he is liable to lose hard-earned savings. Or it could even be a sign that he does not have enough money to survive unless he tries his luck at a roulette table (i.e. sign of low quality). Similarly for many other risky behaviors (including recreational risks), such different predictions seem to be almost equally plausible, although the argument that predominates is liable to depend on the domain. For instance, the third low-quality-cue argument would not apply to health risks with no direct possibility for resource gain (e.g. riding a motorcycle without a helmet).

In the first part of our research, we tested whether risk taking by the opposite sex is generally regarded as attractive or if the domain affects which risks are attractive and which not. We were not sure whether or which domains would prove attractive or unattractive, so we left this open for exploration. We tested both men and women, because mate selection in our species, where both sexes invest in parental care, often depends on mutual attraction (Trivers, 1972; Hamon and Ingoldsby, 2003). But aspects of fitness that are desirable in a mother are not always the same as what is desirable in a father, which could lead to different types of risk taking being used as cues of quality by the two sexes. Sex differences in such preferences could explain sex differences in risk taking, either through natural selection or through individual learning by experience.

Methods

As mentioned above, we used both an English and a German version of an existing domain-specific risk-attitude scale (Weber et al., 2002; Johnson et al., 2004). There are advantages in using a validated instrument rather than a novel questionnaire designed to test specific evolutionary-based predictions, although both approaches are valid. On the basis of data from hundreds of subjects, the items in the instrument had been selected from a larger set so that there was a high consistency within each domain in subjects' self-reported propensity to take such risks and their perception of their riskiness. Weber et al.'s (2002) factor analyses established that behavior and perception in each of the domains were to a considerable degree independent of those in other domains. Thus, a priori, it makes sense that humans might consider risks within each of these domains similarly attractive, if only because a potential mate that takes one risk is more likely to take another risk in the same domain, or because a subject that finds one risk scary is more likely to find another risk in the same domain scary. To jump ahead, our study will confirm the validity of these domains for assessing the attractiveness of risk taking in that the inter-domain differences far exceed inter-item differences within a domain.

The domain-specific risk scale was administered in paper-and-pencil form to 60 subjects (30 women, 30 men) at the laboratory of the Max Planck Institute for Human Development (MPI), Berlin. In addition, the risk scale was put online and given, as part of a larger study, to a pool of undergraduate students at the University of Michigan, Ann Arbor; after a small number of subjects were discarded for failing to meet our pre-established completeness criterion (no more than 2 missing responses across 40 items), data from 140 undergraduates remained (122 women, 18 men). Note that the imbalance in U.S. sample sizes is because data were collected in two different terms, in which class sizes for the same course differed. All subjects were either selected (Germany) or self-reported (U.S.) to be heterosexual and neither married, engaged, nor in a stable relationship at the time of testing. Upon completion of the survey, subjects were paid (Germany) or received course credits (U.S.). The risk instrument was given in either German or English, but was otherwise identical. For both male and female subjects the mean age was 23 years for the German sample ($SD = 2$) and 19 years ($SD = 1$) for the U.S. sample.

We had subjects rate each of 40 risky activities for their attractiveness in the context of mate choice on a 5-point bipolar scale from 1 (*very unattractive*) to 5 (*very*

attractive) with the scale mid-point 3 being neutral. The context and task was described by the following text:

> Please imagine that you are single and not in a relationship with someone else. You meet someone and start casually dating that person. For each of the following statements, please indicate how attractive it would appear to you if this man [replaced by "woman" for male subjects], whom you are currently dating, would engage in these activities or behaviors.

Examples of the risk items were "trying out bungee jumping at least once" for the recreational domain, "cheating on an exam" for the ethical domain, "gambling a week's income at a casino" for the gambling domain, "investing 5% of his [her] annual income in a very speculative stock" for the investment domain, "regularly eating high cholesterol foods" for the health domain, and "defending an unpopular issue that he [she] believes in at a social occasion" for the social domain. See the Appendix for a full listing. There were eight items for each domain, except that financial risks were split into two sets of four items each (gambling and investment).

Results

The datasets from the U.S. and Germany were analyzed separately, using the generalized linear model command of MINITAB v. 12. In the resulting analysis of variance (ANOVA) item was nested within domain, subject was nested within sex, and subject was fully crossed with item (see Table 1); item and subject were considered random factors, the others fixed. The nested design establishes whether responses to the eight (or four) items in a domain are consistent enough for conclusions to be drawn about the domain in general (Bart, Fligner, and Motz, 1998, chapter 6).

Table 1. Analysis of variance of ratings of attractiveness if a potential partner took particular risks

| | German | | | | U.S. | | | |
Source	df	Adj. MS	F	p	df	Adj. MS	F	p
Domain	5	158.8	11.18	< .001	5	221.1	25.88	< .001
Item (Domain)	34	13.42	13.13	< .001	34	7.24	3.52	< .001
Sex	1	1.09	0.31	.58	1	6.38	1.18	.028
Subject (Sex)	58	3.08	2.35	< .001	138	3.92	2.24	< .001
Domain (Sex)	5	2.43	1.34	.25	5	8.75	2.60	.031
Sex × Item (Domain)	34	1.02	1.73	.006	34	2.06	3.70	< .001
Domain × Subject (Sex)	290	1.38	2.33	< .001	690	1.86	3.35	< .001
Error	1967	0.59			4692	0.56		

Note. F tests are based on adjusted mean squares calculated by the GLM command of MINITAB v. 12. Parentheses indicate nesting.

The results in Table 1 can be summarised as follows.

(1) Domain has a highly significant effect on how attractive risk-taking is. We investigate presently which domains are significantly attractive and unattractive.

(2) Sex has no effect on overall level of attractiveness of risk taking in general.

(3) In the German sample there is no evidence that the sexes differ in the pattern of attraction to different domains (p = .25). Thus it is not appropriate to test sex differences between individual domains. In the U.S. sample the sexes do differ significantly (p = .03) in the pattern of attraction to different domains. Given that the two samples provided two opportunities for a low p-value, this might arguably be regarded as non-significant at the 5% level. Nevertheless, in the U.S. sample we tested whether the sexes differed in each domain. The appropriate standard errors for the t tests were obtained from the error mean square for the domain×sex term from the ANOVA. The only significant difference was that women found ethical risk taking 0.45 of a scale unit more unattractive than did men (p = .008, or .045 after Dunn–Šidák correction; see Sokal and Rohlf, 1994).

(4) In both datasets there is a highly significant sex difference in the pattern of attraction to specific items within domains. So our domain-based classification of items may be inappropriate to describe the differences between the sexes even though it is appropriate in bundling the items together into groups of risks that both sexes find attractive or unattractive.

(5) Subjects of the same sex vary significantly in overall level of response (unsurprising and uninteresting), but also in their pattern of relative attraction to risk-taking in different domains. However, the latter might be explicable by ceiling effects caused by the scale having only 5 points: one subject cannot score all domains consistently 1.5 points per item higher than a second subject if the latter has given one domain a mean score of 4.

Illustrating some of these sources of variation, Figure 1 shows the mean German female responses to each item and the variation between women in this response. Although for most items some women report them as attractive and some as unattractive, within each domain there is a high consistency in the mean score for each item; in particular whether the mean score is attractive (>3) or unattractive (<3) is very consistent. Other aspects of consistency are apparent from Figure 2, which displays the mean score within each domain for both sexes and both countries: in no domain did the differences between sexes within a country exceed 0.45 of a scale unit, nor did the differences in score between U.S. and German samples exceed 0.52.

We computed the mean attractiveness score for each domain and tested whether it differed significantly from the scale midpoint (3 = neutral). In the U.S. sample, because of the marginally significant domain×sex term, we analyzed the sexes separately. The appropriate standard errors for the t tests were obtained from the error mean square for the domain term from each ANOVA. Risk taking in the social domain was significantly attractive in all samples [Germany: $t(38)$ = 3.57, p = .003; U.S. men: $t(62)$ = 4.39, p < .001; U.S. women: $t(38)$ = 3.24, p = .003]. In the recreational domain, risk taking had a mean score above 3 in all samples but it was significantly attractive only for U.S. women (Germany p = .16; U.S. men p = .27; U.S. women p = .009). Risk taking in the investment domain never differed significantly from neutrality. Equivalent t tests for the remaining domain scores demonstrate that risks in the ethical (Germany p = .002; both U.S. sexes p < .001), gambling (all p < .001), and health domains (all p < .001) were

consistently highly significantly unattractive. While all *p*-values reported in the text are uncorrected for multiple comparisons, asterisks in Figure 2 show significance levels corrected using the sequential Dunn–Šidák method.

Figure 1. Between-item variation in the attractiveness ratings by 30 German women of male risk taking. The area of each dot is proportional to the number of subjects choosing that rating score. Red crosses indicate the mean score for each item. The number of each item corresponds to those listed in the Appendix.
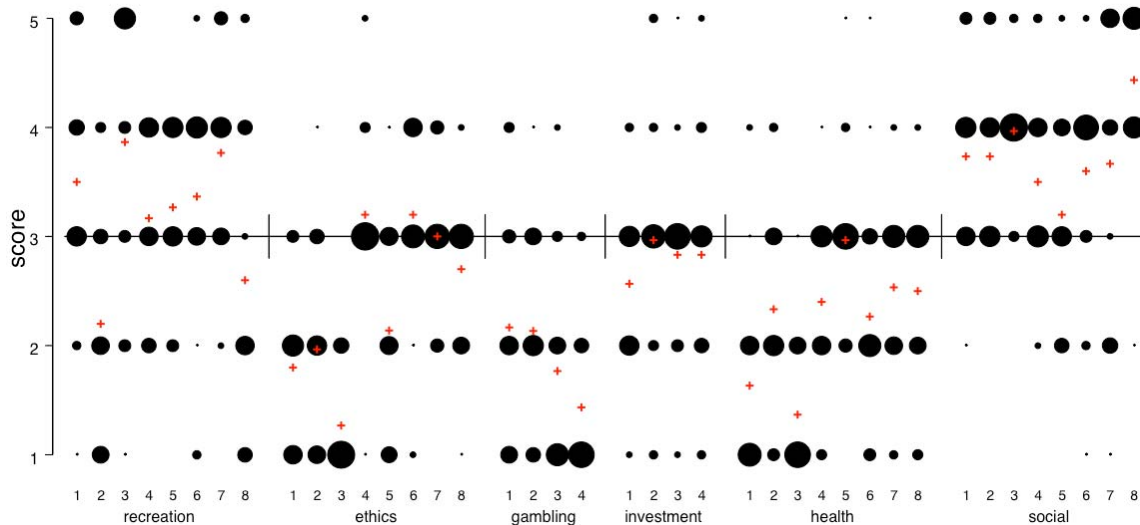

Study 2: Predictions of what risk taking the opposite sex finds attractive

We asked another set of subjects to predict what risk taking on their part would be attractive to the other sex. Knowing which cues to display is advantageous for attracting mates successfully, so if these cues are important in mate choice we expect that each sex will know how the other thinks about these cues (although admittedly it is quite possible to behave attractively without being aware that such behavior is attractive). A second reason to measure beliefs about what the other sex finds attractive is that sex differences in these beliefs could explain sex differences in risk taking even if the beliefs are false. Thus Farthing (2005) found that men, but not women, incorrectly predicted that the opposite sex found non-heroic physical risk taking attractive, which, he argued, could be part of the explanation of why men took more such risks than women.

Methods

Sixty new subjects (30 women, 30 men) at the laboratory of the MPI in Germany filled out a paper version of the domain-specific risk instrument and a further 139 undergraduate students (21 women, 118 men) at the University of Michigan completed an online version as part of a larger questionnaire. Age distribution was almost the same as in Study 1, with a mean of 23 years (*SD* = 3) for the German sample and 19 years (*SD* = 1) for the U.S. sample.

Figure 2. Mean domain scores (and standard deviations across items) for ratings by women of the attractiveness of male risk taking (grey) and by men of the attractiveness of female risk taking (white). Stars indicate significance of difference from neutral rating of 3: * $p < .05$, ** $p < .01$ after sequential Dunn–Šidák correction; German sexes were pooled since their domain means did not differ significantly.
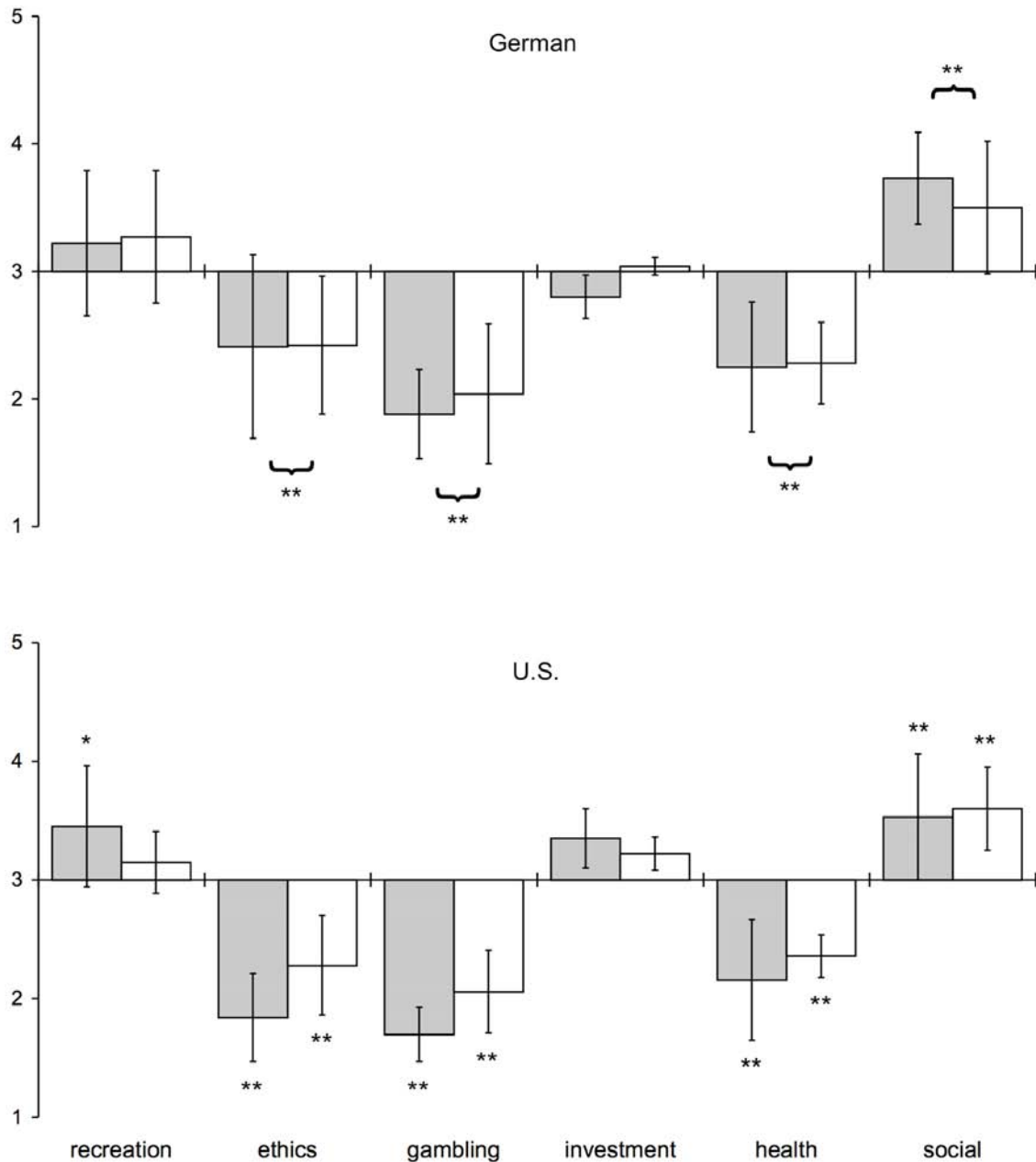
The procedure of testing and all materials remained equivalent to Study 1, except that now subjects were given the following instructions:

> Please imagine that you are single and not in a relationship with someone else. You meet someone and start casually dating that person. For each of the following statements, please indicate how attractive it would appear to this woman [replaced by "man" for female subjects], whom you are currently dating, if you would engage in these activities or behaviors.

Figure 3. Scatterplots of female ratings of attractiveness of risky behaviors performed by a potential male partner plotted against male predictions of this (left) and male ratings of attractiveness of risky behaviors performed by a potential female partner plotted against female predictions (right). Perfect predictions would lie along the identity line.
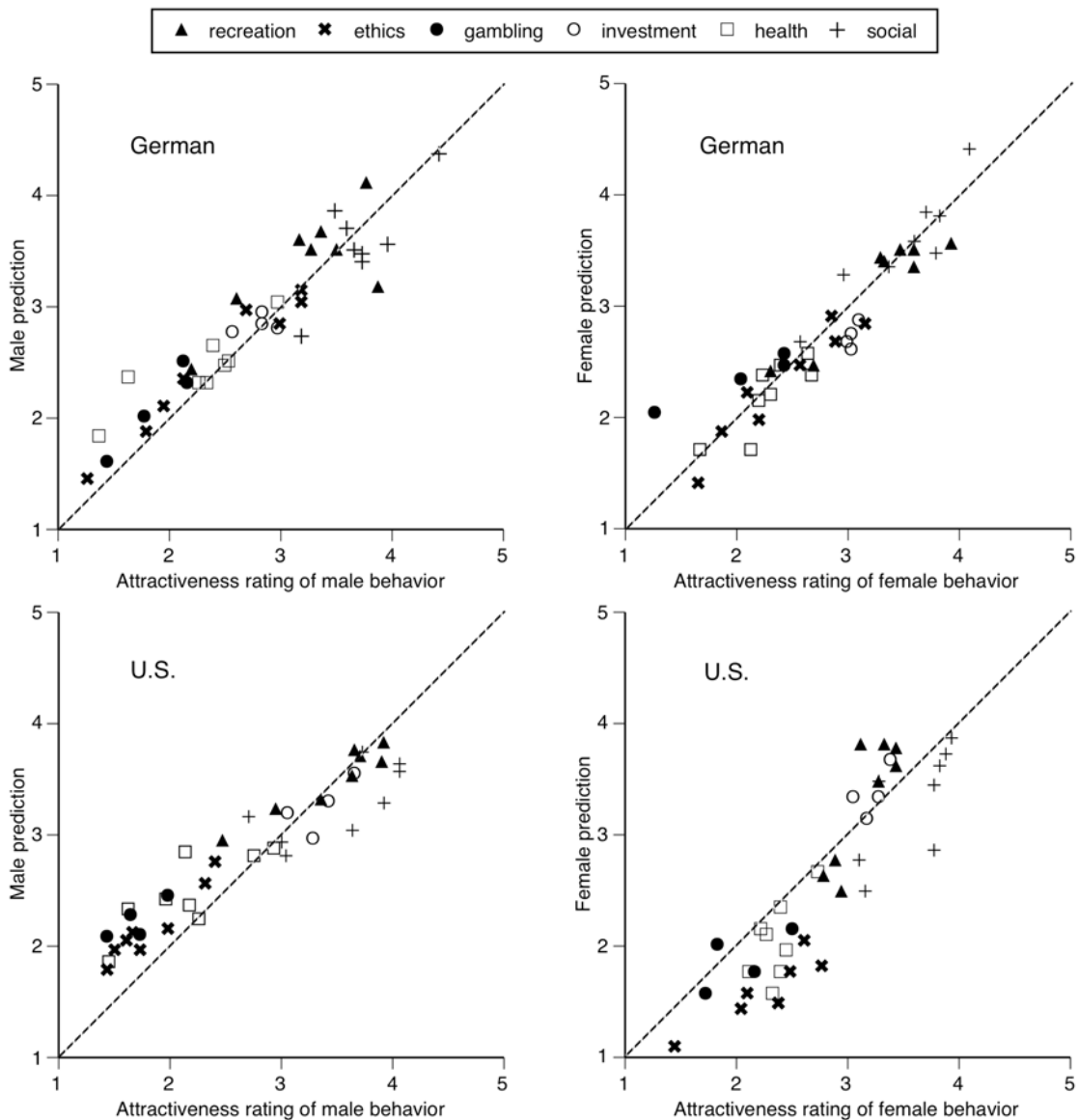
Results

Predictions of what risk taking the opposite sex finds attractive is accurate at the level of individual items (see Figure 3), and hence also at the level of aggregated mean domain scores (see Figure 4). Spearman's rank correlation coefficient quantifies how well one sex identifies which risk taking items the other sex finds more attractive: for predictions by German males $r_S = .93$, by U.S. males $r_S = .94$, by German females $r_S = .96$, by U.S. males $r_S = .89$. Nevertheless Figure 3 reveals some bias in the quantitative estimation of attractiveness: in both Germany and the U.S. men tend to overestimate attractiveness and women to underestimate it, although the bias is slight and only in the U.S. statistically significant [predictions by U.S. men: mean discrepancy (prediction – observation) = 0.12, $t(39) = 2.13$, $p = .040$; predictions by U.S. women: mean discrepancy = –0.25, $t(39) = 3.79$, $p < .001$]. However, the overestimation of attractiveness by men apparently concerns only unattractive risk-taking, and U.S. men, like women, even underestimate the attractiveness of attractive risk-taking. U.S. men's underestimation of how unattractive women would find their unattractive risk-taking might well be because they themselves tend to find such risk taking in a partner less unattractive than do U.S. women (Figure 2). Note that the statistical artifact of regression to the mean might also explain overestimating the attractiveness of attractive risks and the unattractiveness of unattractive risks; but if this artifact alone were important we would expect more consistency between the four parts of Figure 3.

Regardless of predictive accuracy, sex differences in how attractive one believes one's own risk taking is could lead directly to the observed sex differences in behavior. Figure 4 suggests that in both countries in most domains, men predict greater attractiveness, or less unattractiveness, of their own risk taking than do women (the only marked exception is gambling risks in Germany). To test whether this sex difference is significant, we analyzed the predicted attractiveness scores using the same ANOVA model as in Study 1. From Table 2 the following conclusions can be drawn.

(1) There are highly significant differences between domains in how attractive one predicts one's own risk taking to be. This is expected given the actual differences in attractiveness of risks (Study 1) and the high accuracy of their prediction by the opposite sex.

(2) In the German sample, sex makes no significant difference to either the overall level of attractiveness predicted, or the pattern across domains, or the pattern across items within domain.

(3) In contrast, in the U.S. sample sex has a significant effect at every level: in the overall level of attractiveness predicted, in the pattern across domains, and in the pattern across items within domains. Part of this contrast with the German sample might be due to the larger sample size from the U.S. (118 men and 21 women in U.S., 30 and 30 in Germany), but also the absolute sex differences did tend to be larger in the U.S. sample.

Figure 4. Mean domain scores (and standard deviations across items) for male predictions of the attractiveness to women of male risk taking (white) and female predictions of the attractiveness to men of female risk taking (grey). Stars indicate significance of difference from neutral rating of 3: * $p < .05$, ** $p < .01$ after sequential Dunn–Šidák correction; German sexes were pooled since their domain means did not differ significantly.
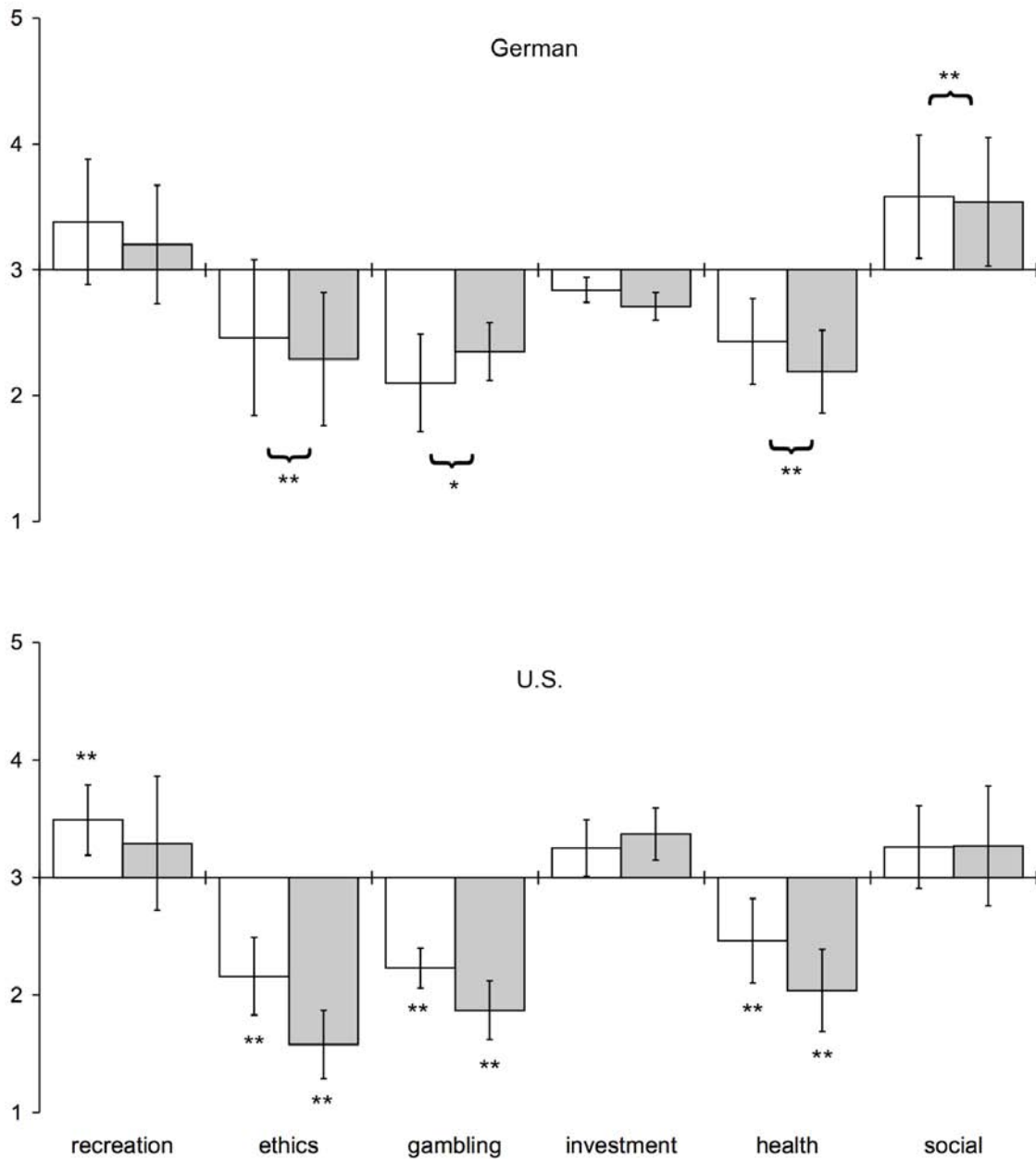
Table 2. Analysis of variance of predictions about attractiveness to the opposite sex of taking particular risks

	German				U.S.			
Source	df	Adj. MS	F	p	df	Adj. MS	F	p
Domain	5	134.09	11.46	< .001	5	238.20	23.83	< .001
Item (Domain)	34	10.97	12.08	< .001	34	8.68	7.95	< .001
Sex	1	3.69	0.89	.35	1	36.18	5.48	.021
Subject (Sex)	88	3.92	2.93	< .001	137	6.14	3.34	< .001
Domain (Sex)	5	2.32	1.42	.23	5	8.10	3.37	.007
Sex × Item (Domain)	34	0.91	1.35	.09	34	1.09	1.72	.006
Domain × Subject (Sex)	440	1.40	2.08	< .001	685	1.95	3.08	< .001
Error	2986	0.67			4657	0.63		

Note. F tests are based on adjusted mean squares calculated by the GLM command of MINITAB v. 12. Parentheses indicate nesting.

Given these significant effects of sex in the U.S. sample, we tested which individual domains showed a significant sex difference. As before, the appropriate standard errors for the t tests were obtained from the error mean square for the domain×sex term from the ANOVA. Men predicted significantly less aversion by women to ethical and health risks than did women with regard to men (differences 0.58, 0.42; $p <$ .001, $p =$ .001), but no other domains showed a significant difference.

To conclude, these sex differences can explain why U.S. courting women would avoid some unattractive risk taking more than men, but they are not convincing explanations of why the amount of attractive risk taking would be greater in men than women: there is almost no sex difference in the most attractive domain (social), and in the other attractive domain (recreational) the sex difference is no more than 0.2 of a scale unit and non-significant.

Study 3: Partners' ratings of each other

Studies 1 and 2 have shown that risk taking in particular domains can be attractive or unattractive to members of the opposite sex, but does this really influence the choice of a long-term partner? Our final study links female and male risk preferences to actual mate choice by looking at preferences and behaviors within couples. If specific risk taking is attractive in the context of mate choice, we predict a relationship between the sort of risk taking that one partner finds attractive and the sort of risk taking that the other performs.

There are a number of ways that risk attitudes and behaviors might be related within couples; here we compare two possible paths. The first hypothesis, following the idea that some risk attitudes and behaviors are sexually selected, is that in the attractive recreational and social domains, behaviors that individual women find most risky will be judged by them as particularly attractive when performed by men. This will draw women toward men who willingly take such risks and who may also be indifferent to their danger (the likelihood of engaging in risky behaviors and the perception of their riskiness are inversely correlated: e.g. Slovic, 1964). For instance, a woman who is particularly

frightened by heights might be particularly impressed by the apparently courageous bungee-jumping behavior of a man who has no such fear. Thus this hypothesis predicts within a partnership a negative correlation between male and female risk perception and also a negative correlation between the risky behaviors taken by each partner (i.e. "opposites attract"). These arguments are reversed for domains in which risk taking is aversive (i.e. ethics, gambling, and health): A man performing the behaviors that a woman finds most risky (and aversive) will be particularly unattractive to her, so women should be more attracted by men who share their risk perceptions, leading to a positive correlation in risk perceptions, and in risky behaviors, for these domains.

A second hypothesis that is based on mere social encounter and does not involve sexual selection points in the opposite direction in the attractive domains: Men and women sharing common attitudes toward risk may be involved in the same activities (e.g. both members of a mountaineering club) and thus would be more likely to pair up, leading to a positive correlation between partners in behaviors and in risk perception in any of the domains (i.e. "assortative pairing"). Also favoring a positive correlation would be if couples sharing common attitudes toward risk and sensation seeking are more likely to remain together. In the unattractive domains, both hypotheses suggest a positive correlation, so we will have to rely on data from the attractive domains to distinguish them.

There is some existing evidence that risk attitudes do appear comparable in couples ("assortative pairing"): Similar within-couple levels of sensation seeking have been suggested as an important determinant of marital compatibility (Lesnik-Oberstein and Cohen, 1984). Sensation seeking is the individual desire for variety in sensations and experiences and the willingness to take risks for the sake of such experience, and it reliably correlates with membership in risk-taking groups (Zuckerman, 1994) and particular physiological characteristics (e.g. gonadal hormones; Zuckerman, Buchsbaum, and Murphy, 1980). Couples positively assort on scores derived from the Sensation-Seeking Scale (Farley and Davis, 1977) while dysfunctional couples seeking marital therapy have less congruency and much lower correlations in their scores than other couples (Ficher, Zuckerman, and Neeb, 1981).

Methods

Our subjects were 25 young heterosexual couples who came together to the laboratory of the MPI and were paid for their participation. Couples were pre-selected on the criteria that they must have been together for at least two years and were either married, engaged and/or living in the same apartment. Mean age for women was 24 years ($SD = 2$) and for men 26 years ($SD = 2$). Each partner independently answered the full 40-item risk scale in multiple forms: the risk *behavior* subscale (i.e. indicate your likelihood of engaging in each activity or behavior), the risk *perception* subscale (i.e. indicate how risky you perceive each activity to be), and the risk *attractiveness* subscale (i.e. indicate how attractive it would have appeared to you if your current partner had engaged in these listed activities or behaviors during the early time of your relationship). All questionnaires were returned in sealed envelopes and remained anonymous to partner and experimenter.

Results

As in Study 1, women reported risks in the recreational and social domain as being attractive, shown in the first data column of Table 3. How attractive a woman finds a risky behavior (relative to other women) mostly correlates positively with her partner's reported likelihood of doing it (relative to other men), and vice versa for men (median across items of Spearman's $r_S = 0.15$ and 0.18, Wilcoxon $T(40) = 653$ and 719, $p = .001$, $p < .001$, respectively). This is consistent with risky behaviors having a role in mate choice, but is not a direct test of our two hypotheses because it does not consider how the perceived degree of risk affects attraction.

To examine whether men and women in couples match in their risk attitudes and behaviors in each domain, we computed Spearman rank correlation coefficients across all the couples, by first calculating the mean risk perception and behavior score per domain per person, and then within each domain and for each subscale correlating the females' mean scores with the mean scores of their partners. Table 3 shows these correlations within each risk-taking domain for the two subscales.

Table 3. Means and standard deviations (across subjects) of attractiveness ratings by women, and Spearman rank correlation coefficients between each partner's mean scores on the specified subscale for items in the specified domain

Domain	Means (*SD*) for female attractiveness ratings	Correlation between subscales		
		Male and female perception of risk	Male and female behavior	Woman's perception of risk and her rating of attractiveness if partner had taken risk
Recreation	3.28 (0.34)	.25	.52*	− .55*
Ethics	2.53 (0.50)	.11	.13	− .32
Gambling	1.79 (0.29)	− .04	.15	− .52*
Investment	2.83 (0.24)	− .20	.02	− .37
Health	2.34 (0.37)	.20	.48*	− .41
Social	3.68 (0.71)	− .12	.18	.08

Note. * $p < .05$ after sequential Dunn–Šidák correction for families of 6 comparisons.

The between-partner correlations for perceptions of risk are displayed in the second data column of Table 3. Here, the "opposites attract" hypothesis predicts that perceptions of risk taking in the recreational and social domains should be negatively correlated, whereas in the unattractive domains (i.e. ethics, gambling, and health) they should be positively correlated. However, domain-specific correlations for partners' risk perceptions appear mixed and none of them reaches statistical significance.

The two hypotheses also predict that correlations between partners' behaviors (or their reported likelihood of performing it) will have the same sign as those predicted between their risk perceptions (because within both individuals perception and behavior

are expected to be negatively correlated). Rather than the negative between-partner correlations in recreational and social risk-taking predicted by the first hypothesis ("opposites attract"), we observed positive correlations ($r_S = .52$, $p = .008$ and $r_S = .18$, $p = .379$, respectively) as shown in the third data column of Table 1. This fits better the explanation from the "assortative pairing" hypothesis (see also Ficher et al., 1981). The between-partner behavioral correlations for the remaining domains—where both of our hypotheses predicted positive correlations—indeed show positive correlations, although most of them are small (ethical, gambling, and investment domains) and only the health domain reaches statistical significance ($r_S = .48$, $p = .016$). Thus in terms of both within-couple risk perception correlations and behavior correlations, we find more support for the second, "assortative pairing", social encounter hypothesis than for the first, "opposites attract", sexual selection hypothesis.

Furthermore, if risk taking were an important attractive cue in mate choice in the recreational and social domains, there should be a positive correlation between how risky a woman finds a behavior and how attractive she would have found such behavior in her partner. Instead, as shown in the last column of Table 1, there is a strong negative correlation in the recreational domain ($r_S = -.55$, $p = .004$) and little correlation in the social domain ($r_S = .08$, $p = .719$). So risk taking in the recreational domain does not seem to be used as an attractive cue by women in the choice of a long-term partner and may actually be aversive. In the ethical, gambling, and health domains these correlations are also negative ($r_S = -.32$, $p = .120$; $r_S = -.52$, $p = .007$; $r_S = -.41$, $p = .043$), which supports the earlier evidence that risk taking in these domains is aversive and suggests that avoidance of these aversive traits may be important in selecting a long-term partner.

Thus, in all but one domain (social), those women who found each type of risk more daring compared with other women's perceptions also found it less attractive. This prompted us to examine the corresponding relationship between individual items within domains: It turns out similarly that those items that were considered more daring by women on average were those that they considered less attractive. The relationship holds not only within most domains, but across items from all domains ($r_S = -.66$, $p < .001$) as shown in the upper left panel of Figure 5. This is an intriguing finding because it means that those risks that appear moderately to highly attractive—recreational and social risks—are those judged to have moderate to low perceived personal riskiness (e.g. "going camping in the wilderness" or "defending an unpopular issue at a social occasion").

One conclusion from this could be that recreational and social risks are particularly attractive simply because those are the risks that few people are afraid of. A different explanation for these findings could be that people in a long-term relationship may not currently like their partners to take unnecessary risks, especially if there are children or a mortgage to support. We had asked subjects to imagine the attractiveness of their present partner performing each behavior when their relationship was in its infancy, but it is possible that their present risk attitudes interfered with accurate recall of this state. It could well be that the partner preferences we found earlier for engaging in recreational and social risks change when people shift from being unattached and looking for a partner to being in a long-term relationship.

Figure 5. Scatterplots of female ratings of attractiveness of current male partner (above) or potential male partner (below) plotted against perceived risk (left) and perceived benefit (right). Each point is a particular item, with the symbol indicating its domain. Data on attractiveness are taken from our Study 3 (above) and Study 1 (below), and those on perceived risk and benefit (lower left and right) from Johnson et al. (2004).
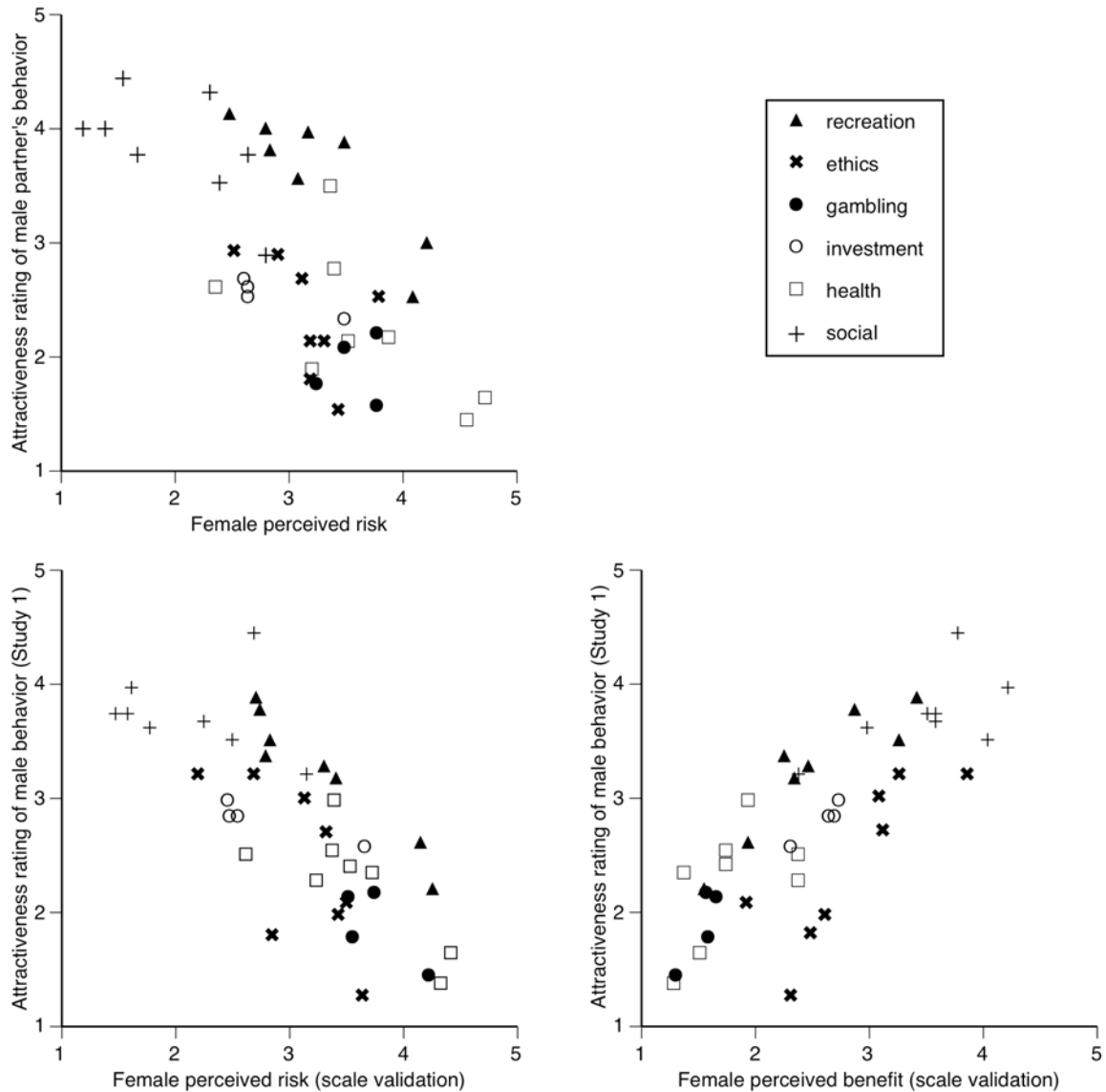
To test whether risk perceptions do change with relationship status, we could have collected such risk perception versus attractiveness data also for the singles in Studies 1 and 2. In order to approximate this comparison, we took the German female and male attractiveness ratings from Study 1 and plotted them against risk perception data taken from the German scale validation study of the domain-specific risk scale (see Johnson et al., 2004; *n* = 347 women, 185 men). Although the latter data were collected outside of the laboratory using a different testing procedure and our results should be interpreted with caution, subjects from both samples are quite comparable in terms of age range and

background demographics. For the scale validation we did not ask about relationship status, but since subjects were predominantly students we can expect that a large majority were single. The lower left panel of Figure 5 shows this same-sex association between attractiveness ratings and perceptions of risk for these mostly-single women. It turns out that the same relationship holds as with the couples: The most attractive items are the least risky ($r = –.76$, $p < .001$). The same relationship also holds for men (not shown; $r = –.71$, $p < .001$). The similar scatterplots for couples and mostly-singles suggest that, no matter whether people are in a relationship or not, they find the least risky activities to be the most attractive.

We have so far assumed that these correlations are driven by a causal relationship from perceived riskiness to attraction, but another explanation might involve a causal relationship from attraction to perceived riskiness. If recreational and social risks are the ones that are attractive and important in the context of mate choice, people might attribute higher benefits to them. Now, an inverse relationship between perceived benefit and perceived risk has been repeatedly reported (Alhakami and Slovic, 1994; see also Weber et al., 2002). So this possible chain of causation is that attractive risks cause high perceived benefits, which are correlated with low perceived risks, and hence low perceived risks correlate also with attractiveness. There is a further alternative explanation in which it is variation in perceived benefits that drives this correlation. It seems reasonable that risk taking involving high perceived benefits would be reported as attractive, because women especially tend to find mates with resources more attractive, and perhaps also because taking such "sensible" risks is a sign of intelligence. As just noted, there is also empirical evidence that risks with high perceived benefits are perceived as less risky, so the consequence could again be a correlation between low perceived risks and attractiveness.

To investigate both these alternative explanations, we took data on perceived attractiveness from Study 1 and plotted them against data from the German scale validation of the risk scale (Johnson et al., 2004) on perceived benefits of risks (i.e., "indicate the benefits you would obtain from each situation"). The lower right panel of Figure 5 depicts this correlation between attractiveness ratings and perceived benefits of risk for women: The most attractive items are indeed also the ones having the highest perceived benefits attributed to them ($r = .89$, $p < .001$). Consequently, it may well be that the negative correlation between perceived riskiness and attractiveness ratings of risk is a result of the strong correlation between peoples' perceived benefits and their attractiveness ratings of these risks, coupled with a negative correlation between perceived risks and benefits.

Discussion

Differences between domains

Our results indicate that risk taking is attractive to the opposite sex in some domains, but unattractive in others. These data contradict the notion that risk taking is generally attractive across all domains. Risk taking in the recreational domain was attractive, although only in U.S. women was it significantly so. Through mechanisms explained in Section 2, we proposed that recreational risk taking could be an honest cue

of physical prowess. This is in line with data showing that men compete for the attention of women by demonstrating athletic ability and displaying strength (Walters and Crawford, 1994), but conflicts with recent results in which men and women evaluated physical risk taking (e.g. risky sports) as somewhat unattractive (Farthing, 2005). One potential reason for this disagreement is that Farthing (2005) inappropriately used only the between-subjects variation when testing his mean domain scores against indifference; it is critical to consider the between-item variance if one wishes to draw conclusions about physical risk taking in general rather than about just the items tested (Bart et al., 1998, chapter 6). So although Farthing claimed that risk taking was significantly unattractive, the significance may have been overestimated, so that his and our results need not be statistically incompatible. A more fundamental explanation for the difference between the studies is that each of Farthing's vignettes emphasizes that the person thinks it "very risky" to take the risk. We found that risk is inversely correlated with attractiveness, so Farthing's wording may make his vignettes unattractive, while the attractive recreational risks in our studies are attractive because they are perceived as not very risky.

We found that risk taking was also attractive in the social domain. There is existing evidence that women value social status in a long-term mate (Buss, 1989) and prefer marriage partners with success in their profession and promising further career prospects (Buss and Schmitt, 1993): Social risk taking may indicate that a man has attained, or is on the path to, such status and success, if through the handicap principle such risks are only worthwhile taking for individuals with social skills capable of achieving high status. However, we have some concerns whether social risk taking really does signal present or future social status: At least in our own culture it appears to us that those of the highest social status often take the least risks socially, perhaps because they have the most to lose by a social gaffe.

Risk taking in three other domains was consistently rated as unattractive (health, ethics, and gambling; see also Farthing's 2005 finding that people prefer partners who avoid risks related to intensive alcohol or drug consumption). In these domains it may be that risk taking does not correlate with important aspects of quality, or that any benefit of choosing a mate high in such qualities is outweighed by the consequences for the mate's ability to care for the family if the risk taking fails.

Results for the German and U.S. samples are similar. The only domain in which one country rated risk taking attractive and the other rated it unattractive was investment, but the differences from the scale midpoint were not significant. Other differences are in degree rather than direction (e.g. U.S. college students rated social risks as less attractive than did German subjects). Although these dissimilarities might well be attributable to subjects' cultural background, they could also be due to differences in demographic characteristics or testing conditions. We think of both cultures as similar and intended the two samples as replications rather than the basis of a cross-cultural comparison. Any claims for or against the universality of domain-specific risk preferences would require further testing in diverse cultures.

Comparison between sexes

Both sexes reported risk taking in the ethical, gambling, and health domains as unattractive and risk taking in the recreational and social domains as attractive. The close

agreement between the sexes extends to a per-item analysis based on correlation (Figure 3). In the U.S. sample women find ethical risk taking more unattractive than do men, but this is the only such comparison yielding a significant difference. Bassett and Moss (2004) were also surprised by how similar the sexes were in the extent to which they preferred risk-takers in various contexts. Farthing (2005) found that only heroic risk taking was substantially more attractive to women than men; however, in our reanalysis of his unpublished data comparing sex differences against between-item variation instead of between-subject variation, the significance level is only .028, which would also become non-significant after correction for multiple comparisons. This picture of the overall similarity between the sexes may mean either that men and women learn to value the same traits for non-adaptive reasons (e.g. a cultural norm) or that the same sorts of risk taking might (at least in societies with male investment comparable to female levels) be a reliable cue to quality for both sexes.

When comparing men and women's beliefs about what the other found attractive the only significant differences were that U.S. men estimated women's aversion to men taking ethical and health risks to be less than the reverse. Thus, to summarize the sex differences, for attractive risks we did not find that women were significantly more attracted by such risk taking than were men, nor that men's estimates of the attractiveness to the opposite sex were significantly greater than women's. Farthing (2005) did claim a significant sex difference in a domain where risk taking was attractive ("heroic risk-taking"), but, as a claim about the domain rather than the particular four items assessed, it is suspect because he did not consider between-item variance (Bart et al., 1998, chapter 6). Only in two domains where risk taking was unattractive (ethical and health) did we find some quantitative sex differences. These sex differences are in a direction to explain why men take more unattractive risks than women, even though they do recognize that they are unattractive. This is our only success in explaining, on the basis of mate choice, the well documented sex difference in risky behavior that originally stimulated this research. However, we should make a couple of caveats. First, our sample sizes, whilst sufficient to establish whether a domain is attractive or unattractive, are somewhat low to detect smaller quantitative differences between the sexes. It is almost inevitable that larger sample sizes (of items as well as of subjects) could establish further minor sex differences in what is attractive, which potentially might have driven selection for differences in risk taking. Second, one referee has pointed out that even if the sexes do not differ in how attractive they find risk taking, the greater skew in male reproductive success will mean that there is greater selection for males to take attractive risks. Another possibility is that, as Farthing (2005) proposed, men may take more risks to attract same-sex friends or to establish status in a same-sex hierarchy, which our data do not test. Note also that, whether or not there are sex differences in attractiveness of risk taking, there remain other non-signaling explanations for males taking more risks than females (Daly and Wilson, 1988, chapter 8).

Not only do both sexes largely predict the same preferences for the other, but they are both largely correct: Both sexes are good at predicting the attractiveness of different risky activities to the opposite sex even at the level of individual items. This could mean that members of each sex have a well-tuned ability to predict the other sex's preferences even if they differ from their own. But, since men and women find the same sorts of risk taking attractive (Study 1), individuals can simply estimate what the other sex likes by

what they themselves like; indeed this strategy explains some cases where the predictions are slightly out (unattractive risk taking in the U.S.). There is thus no need to posit an impressive understanding of the other sex's desires. This hypothesis could be further investigated by collecting within-subject data for both conditions (e.g. does a man who finds mountain climbing particularly attractive also think that women find it particularly attractive?), but we considered collecting such data to be too problematic because one question could easily interfere with the response to the other.

Systematic errors in the overestimation or underestimation of the attractiveness of risk taking can be studied within the framework of error management theory, which proposes adaptive explanations for such biases in social judgment (Haselton and Buss, 2000). Are men prone to err toward overestimating the attractiveness of their risk taking to women, because they should not miss any opportunities to signal their mate quality, or would they be better off by being as accurate as possible (e.g. to avoid unnecessary high potential costs of risk taking)? Our current data indicate that no such overestimation exists for attractive risks and that men underestimate the unattractiveness of unattractive risks (see Figure 3), which does not fit with error management theory. Farthing (2005) found a similar pattern: Attractiveness in the attractive heroic domain was accurately estimated or slightly overestimated whereas men (and women less consistently) underestimate unattractiveness of aversive risk-taking domains (based on our reanalysis of Farthing's unpublished item means). Although individual women, relative to their same-sex peers, seemed particularly attracted to the items that their own partners reported a likelihood to perform, other correlations suggested it was not the degree of perceived riskiness that made these items attractive. We rejected the hypothesis that women pair with men who engage in the risks that the women find most daring. Our results instead indicate that couples match on propensities to engage in particular risky behaviors, though only two domains, recreation and health, showed significant positive assortment. One mechanism by which this matching could occur is that people with similar risk attitudes have similar activities and thus are more likely to meet. In a study asking singles for their mate preferences for long-term partners, Buston and Emlen (2003) found that subjects preferred those similar to themselves, which should also lead to positive assortment. Buston and Emlen suggested the adaptive explanation that partnerships between more similar individuals might profit from higher relationship stabilities and lead to higher reproductive success in the long run compared to partnerships based on complementary reproductive potential in which women have traded youth and fertility for male status and resources (see also Borgerhoff Mulder, 2004; Both, Dingermanse, Drent and Tinbergen, 2005).

Future directions

Our biggest surprise was that the less risky an item is perceived to be, the more attractive it is (Figure 5). Presumably a situation involving almost no risk would not be ultra-attractive (in the absence of associated benefits), so there must be a reversal in this trend at risks lower than were included in our instrument. Future studies should include risks involving both very low and very high perceived danger to test whether the relationship between riskiness and unattractiveness stays monotonic over a wider range.

One of our explanations for the negative relationship between perceived risk and attractiveness relied on the idea that attractive risks would be reported as having a high benefit, which is correlated with low perceived riskiness. To judge this hypothesis it becomes important to understand what subjects understand when asked to rate the riskiness or benefit of a particular item. For instance when rating riskiness, subjects might conceivably be influenced by the probability of failure, or by the potential cost if the bad outcome indeed occurs, or by some combination of these quantities such as the expected cost (i.e. the mean of all possible costs and benefits each weighted by its probability). Similarly when rating benefit, subjects might be judging the potential benefit if the good outcome occurs, or some average of the payoffs from all possible outcomes weighted by their probabilities. It may be that many subjects would be confused if asked to judge just one of these aspects, but it ought to be possible to vary probabilities and consequences in described scenarios and see which aspects affect subjects' responses. Quite possibly not all subjects are responding to the same aspects when they rate riskiness or benefit. Future studies should try to clear up these ambiguities.

Another interesting topic for future studies would be to distinguish what is attractive when seeking a short-term relationship from that when seeking a long-term partnership. For instance, whereas "having an affair with a married man or woman" or "consuming five or more servings of alcohol in a single evening" might be regarded by some as attractive characteristics for short-term mates, most people would probably prefer long-term partners to avoid such activities. In Studies 1 and 2 we asked young adults to imagine being single and to evaluate someone whom they are "starting to casually date"; this nevertheless fails to specify whether the aim is a short-term or long-term relationship, and this is likely to vary between subjects. Asking subjects to quantify to what extent they are currently seeking long-term or short-term relationships might explain some of the inter-subject variation. In Study 3 we asked subjects to imagine being at the start of their present long-term relationship, so it is likely that their responses emphasized characters attractive in a long-term partner. It is reassuring that which domains are rated as attractive or unattractive are similar in Study 3 as in Studies 1 and 2, despite the much greater likelihood that the latter subjects are thinking of short-term relationships.

Overall, our results emphasize the necessity of taking a domain-specific approach to studying the functions of risk taking. Although we still do not know if human mechanisms for decision making about risk evolved for particular domains (e.g. foraging) separately or for the more general problem of choice under uncertainty (see Barrett and Fiddick, 1999), using an instrument such as the domain-specific risk scale (Weber et al., 2002) leads to new testable predictions and a more differentiated understanding of risk taking (e.g. explaining what kinds of risks in which domains signal important cues in human mate choice). Given the findings we obtained with this domain-specific instrument, we believe such a methodology might also be useful for other future studies, even though we recognize a caveat: Weber's original scale was developed in the field of judgment and decision making with no claim (or aim) that any of the originally chosen domains are particularly valid in evolutionary terms, nor that this instrument would be well-suited for testing questions inspired by evolutionary theory. While a similar caveat probably holds for the majority of studies in evolutionary psychology that use measurement tools developed elsewhere in psychology, we believe that we can and

should do better: The development of a new domain-specific instrument focusing on the recurring risk domains that our ancestors faced may profit research both on mate choice and on risk taking more generally.

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Appendix

Risk items

Going on a vacation in a third-world country without prearranged travel and hotel accommodations. (R1)
Going down a ski run that is beyond your ability or closed. (R2)
Going camping in the wilderness, beyond the civilization of a campground. (R3)
Going whitewater rafting during rapid water flows in the spring. (R4)
Periodically engaging in a dangerous sport (e.g. mountain climbing or sky diving). (R5)
Trying out bungee jumping at least once. (R6)
Piloting your own small plane, if you could. (R7)
Chasing a tornado or hurricane by car to take dramatic photos. (R8)

Having an affair with a married man or woman. (E1)
Forging somebody's signature. (E2)
Passing off somebody else's work as your own. (E3)
Illegally copying a piece of software. (E4)
Shoplifting a small item (e.g. a lipstick or a pen). (E5)
Stealing an additional TV cable connection off the one you pay for. (E6)
Cheating on an exam. (E7)
Cheating by a significant amount on your income tax return. (E8)
Betting a day's income at a high-stake poker game. (G1)
Betting a day's income on the outcome of a sporting event (e.g. baseball, soccer, or football). (G2)
Betting a day's income at the horse races. (G3)
Gambling a week's income at a casino. (G4)
Investing 5% of your annual income in a very speculative stock. (I1)
Investing 5% of your annual income in a conservative stock. (I2)
Investing 10% of your annual income in government bonds (treasury bills). (I3)
Investing 10% of your annual income in a moderate growth mutual fund. (I4)
Engaging in unprotected sex. (H1)
Not wearing a seat belt when being a passenger in the front seat. (H2)
Not wearing a helmet when riding a motorcycle. (H3)
Exposing yourself to the sun without using sunscreen. (H4)
Walking home alone at night in a somewhat unsafe area of town. (H5)
Buying an illegal drug for your own use. (H6)
Regularly eating high cholesterol foods. (H7)
Consuming five or more servings of alcohol in a single evening. (H8)
Admitting that your tastes are different from those of your friends. (S1)
Disagreeing with your father on a major issue. (S2)
Arguing with a friend about an issue on which he or she has a very different opinion. (S3)
Approaching your boss to ask for a raise. (S4)
Telling a friend if his/her significant other has made a pass at you. (S5)
Wearing provocative or unconventional clothes on occasion. (S6)
Taking a job that you enjoy over one that is prestigious but less enjoyable. (S7)
Defending an unpopular issue that you believe in at a social occasion. (S8)

Note: Items were taken from Weber et al. (2002) and are grouped here into their six domains (E = ethical, G = gambling, H = health, I = investment, R = recreational, and S = social), though participants saw them in a random order.