CHAPTER 3

Dealing with Uncertainty Regarding Mate Quality: Is Risk Taking Used as a Cue in Mate Choice?

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, & Schafer, 1999; Kruger & Nesse, 2004). Sexual selection provides 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 outweigh the high risks (e.g., Daly & Wilson, 1988, Chapter 8). Second, 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 that of the handicap principle (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, & 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 & Daly, 1985; Fetchenhauer & 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 voluntary risk takers (e.g., “heroes”) as more attractive

as mates than men engaging in these risks as part of their job (e.g., firefighters). This preference was more influential when women considered potential short-term partners than long-term partners.

Taking this approach further, Farthing (2005) tested whether men and women desire physical risk takers as potential mates. Participants read scenarios about specific risks and then judged the attractiveness of people taking the risk or avoiding it. Farthing found that participants had a preference for physical risk taking 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), so that it might have been only the altruism and not the risk taking that was attractive. Nonheroic physical risk taking (e.g., engaging in risky sports or defending oneself against a mugger) was unattractive. 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" (2005, p. 180). He also argued that nonheroic physical risk taking 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.

Along a similar line, anthropological research suggests that in some cultures, 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 & 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 not only from higher social status, but also from increased mating success (see also Smith, Bliege Bird, & 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 influence of other skills) that makes certain men more attractive, because a whole array of mate qualities may be signaled simultaneously (e.g., physical qualities, cognitive skills, leadership, etc.).

Consequently, to our knowledge only a few psychological and anthropological studies exist that focus on the idea that risk taking might signal important cues in human mate choice. The purpose of the present chapter is to extend our understanding of the possible signaling functions of risk taking and in particular to investigate 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 women find various sorts of risky behavior attractive and if men know which behaviors these are. Second, we tested whether men also have a preference for some forms of female risk taking. This is important because human mate choice is often a mutual process (Hamon & Ingoldsby, 2003), but also because men's predictions of what women find attractive might be explained by men's own preferences. In these two studies, however, what participants reported as attractive in surveys might not be an important component of mate choice in the real world. So our third study moved beyond self-reported mate preferences (as used by Kelly & Dunbar, 2001, and Farthing, 2005) and tested whether these preferences predict the attitudes toward risk taking of partners in stable relationships. We asked both members of several couples 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 & Kuhlman, 2000), but in accordance with recent research that suggests risk taking should be studied from a domain-specific perspective (Blais & Weber, 2001; Weber, Blais, & Betz, 2002).

As we learned in the previous chapter, the question of how to adequately assess risk propensity is still hotly debated. The two most prominent approaches to studying risk taking within the field of psychology—personality measures and behavioral decision-making experiments—suffer from limitations: Personality traits as assessed by paper-and-pencil questionnaires (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 choices between monetary gambles as studied in behavioral decision making have not been shown convincingly to extend to other risk domains (Blais & Weber, 2001) or to behavior outside of the laboratory (Huber, 1997). Recently, Weber, Blais, and Betz (2002) overcame these limitations by developing a new psychometric instrument to distinguish risk-taking attitude and behavior in different domains. 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 chapter, we use both an English and a German version of this domain-specific risk-attitude scale (Weber et al., 2002; see Chapter 2 for details on the German version). We consider six distinct domains of risk taking: recreational (e.g., playing physical sports), ethical (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 below.

Study 1: Female Ratings of Male Risk Taking

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 & 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, & Raymond, 2004). Of our six 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 to the performer and evolutionarily) if the chance of failure is not too high, so that the expected benefits outweigh the expected costs. Only physically more athletic men, who are less likely to fail and are apt to recover more quickly if they do, 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 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 & Houston, 1992). Under these conditions risk taking should be viewed by others as unattractive since it is low-quality individuals that do it.

Consider this illustration of the difficulties in making predictions about whether risk taking is attractive: A young man plays at a roulette table surrounded by potential mates. Is placing a large bet a sign that he has lots of money that he can afford to waste (i.e., attractive)? What if he has a gambling habit? The behavior then 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. 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 with many other risky behaviors (including recreational risks), such different predictions seem to be almost equally plausible and the argument that predominates is liable to depend on the domain. For instance, the low-quality-cue argument would not apply to health risks (e.g., riding a motorcycle without a helmet).

In the first part of our research, we tested whether male risk taking is generally attractive to women or if the domain affects which risks are attractive and which not. We were not sure if specific domain mattered, and if it did, which domains would prove attractive or unattractive, so we left this open for exploration. Additionally, we investigated whether men can accurately predict what risk taking on their part is attractive to women. Knowing which cues to display is advantageous for attracting mates so if risk-taking cues are important we predict that men will know what women think about these cues (although admittedly it is quite possible to behave attractively without being aware that such behavior is attractive). In any case, beliefs about what the other sex finds attractive might explain risk taking even if these beliefs are false.

Method

Participants

The domain-specific risk scale was administered in paper-and-pencil form to 60 participants (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. In that case, after 7 participants were discarded for failing to meet our pre-established completeness criterion (no more than 2 missing responses across 40 items), data from 240 undergraduates were obtained (122 women, 118 men). All participants were either selected (Germany) or self-reported (U.S.) to be heterosexual “singles” and not married, engaged, or in a stable relationship at the time of

testing. Upon completion of the survey, participants were paid (Germany) or received course credit (U.S.). The risk instrument was given either in German or English but was otherwise completely identical. The mean age was 23 years (*SD* = 2) for the German sample and 19 years (*SD* = 1) for the U.S. sample.

Materials and Procedure

To test our two main questions, we had participants 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 midpoint 3 being neutral. Examples of these 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 your 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 you believe in at a social occasion" for the social domain [see Appendix A for a full list of these items (in German)]. There were 8 items for each domain except gambling and investment, which had 4 items each (being considered "subdomains" of the financial domain). Men and women were given the same short written scenario followed by sex-specific instructions that asked for either *attractiveness ratings* of the risks (given to women) or *predictions* on how attractive the risks would appear (given to men):

Please imagine that you are single and not in a relationship with someone else. You meet someone and start casually dating that person.

(Female participant) For each of the following statements, please indicate how attractive it would appear to you if this man, whom you are currently dating, would engage in these activities or behaviors.

(Male participant) For each of the following statements, please indicate how attractive it would appear to this woman, whom you are currently dating, if you would engage in these activities or behaviors.

Results

The two data sets were analyzed separately. We used a univariate three-way analysis of variance (ANOVA) in which item was nested within domain, and subject was crossed with both these factors. The nested design was necessary to establish that 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, & Motz, 1998, Chapter 6; unlike typical analyses in psychology, our initial focus is not on comparisons between participants but between domains). All factors were highly significant for the German and the U.S. sample, revealing three principal sources of variation: domain [F (5, 34) = 11.51, $p < .001$ and F (5, 34) = 23.67, $p < .001$, for Germany and U.S., respectively], item within domain [F (34, 1130) = 11.88, $p < .001$ and F (34, 4719) = 34.78, $p < .001$, respectively], and subject [F (29, 1130) = 5.42, $p < .001$ and F (121, 4719) = 6.47, $p < .001$, respectively]. To illustrate these sources of variation, Figure 3.1 shows the mean female response to each item and the variation among women in this response. Perhaps most importantly, note the high consistency of items within each domain: Although the magnitude of the attractiveness ratings varies among items within each domain, the valence of a domain's items—whether the mean score for each item is attractive (> 3) or unattractive (< 3)—is very consistent.

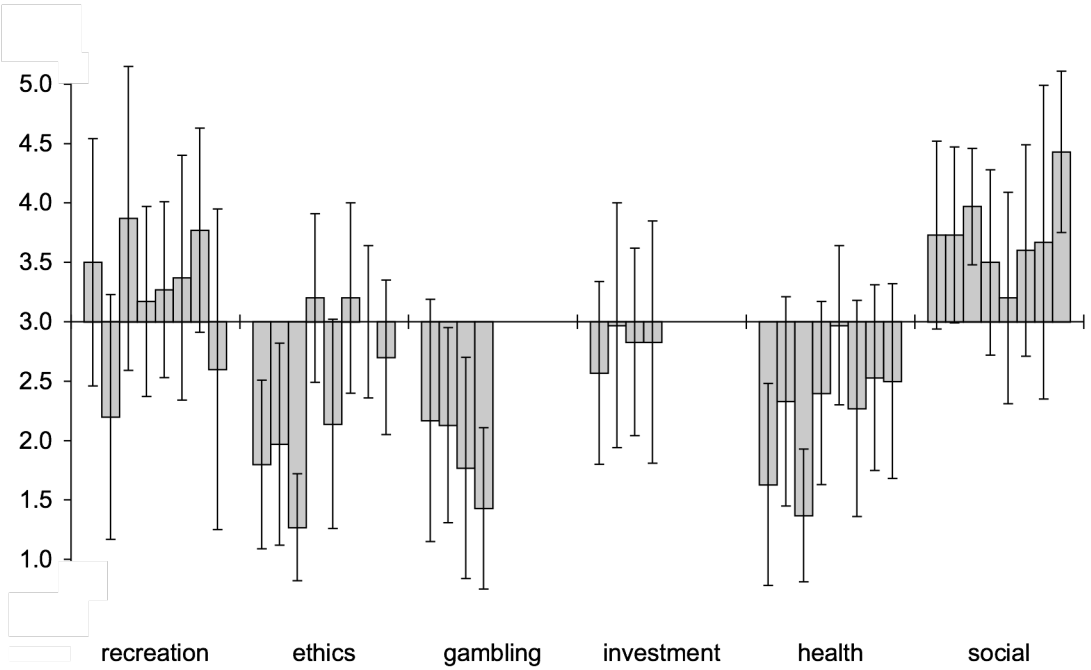

Figure 3.1 Mean item responses (and standard deviations across subjects) for attractiveness ratings by women of male risk taking, German sample.

We computed the mean attractiveness score for each domain and tested whether it differed significantly from the scale midpoint (3 = neutral). The appropriate standard errors for the t-tests were obtained from the between-item within-domain mean square from the ANOVA. Whereas risk taking in the social domain was significantly attractive in both samples [Germany: t (34) = 3.99, $p < .001$; U.S.: t (34) = 3.33, $p = .002$], risk taking in the recreational domain was significantly attractive only for the U.S. sample [Germany: t (34) = 1.20, $p = .238$; U.S.: t (34) =

2.83, $p = .008$]. Equivalent *t*-tests for the remaining domain scores demonstrate that risks in the ethical (Germany: $p = .003$; U.S.: $p < .001$), gambling (both $p < .001$), and health domains (both $p < .001$) were significantly unattractive to women, whereas risks in the investment domain were not judged significantly different from neutral (Germany: $p = .441$; U.S.: $p = .128$). While all *p*-values reported in the text are uncorrected, asterisks in Figure 3.2 show significance levels corrected for multiple comparisons using a sequential Dunn–Šidák method (Sokal & Rohlf, 1994). Overall, ratings are very similar in the two samples, with the exception of investment risks, which appear attractive in the U.S. sample, but somewhat unattractive in the German sample.

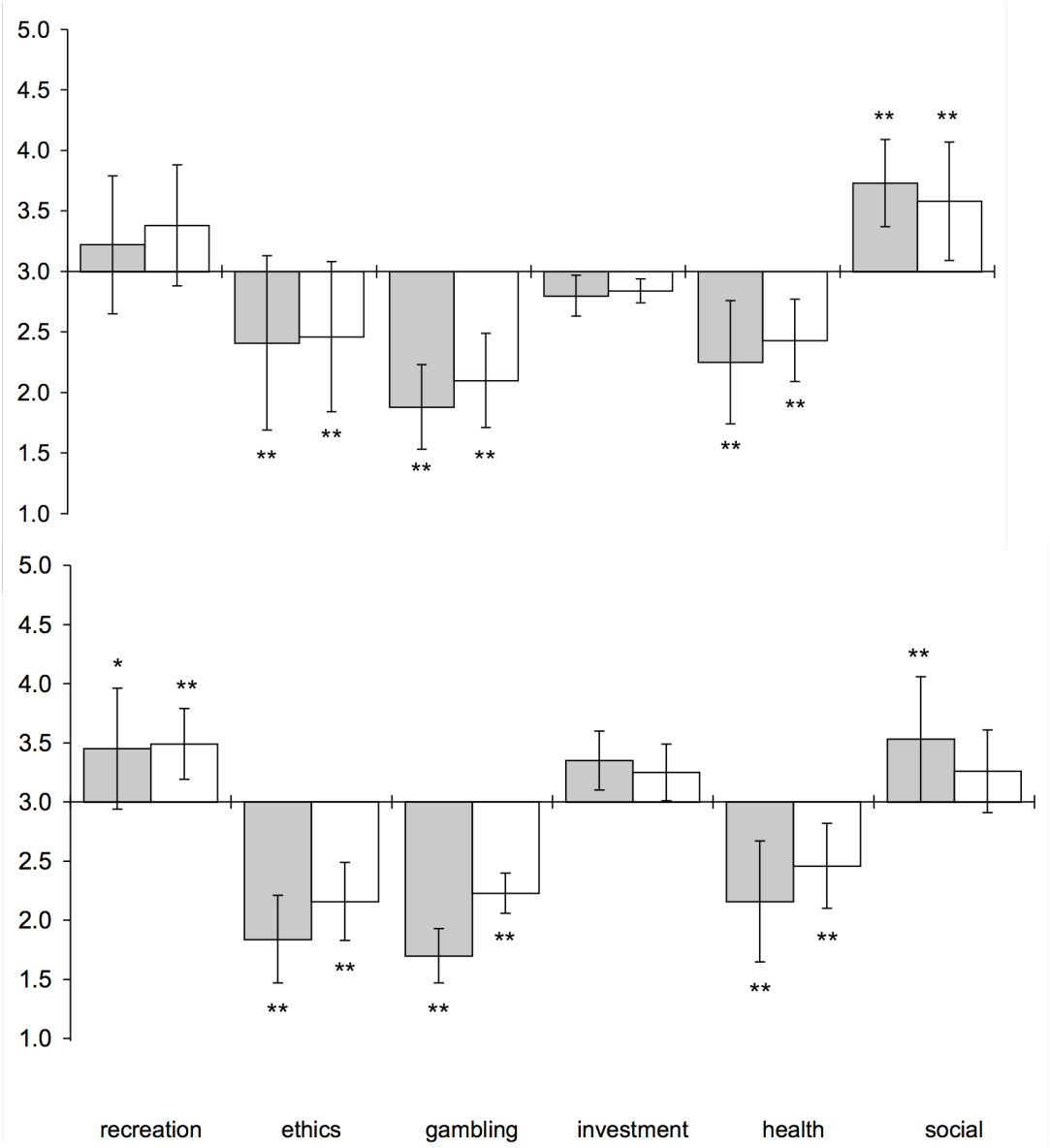

Figure 3.2 Mean domain scores (and standard deviations across items) for ratings by women of the attractiveness of male risk taking (grey) and the corresponding male predictions of these (white) for the German (upper) and U.S. (lower) samples; * $p < .05$, ** $p < .01$ with sequential Dunn–Šidák correction.

Furthermore, male predictions of what females find attractive were accurate not only at the level of aggregated mean domain scores (white bars in Figure 3.2), but also at the level of individual items (Figure 3.3). Correlating mean attractiveness to women ratings with mean male predictions of this for each of the 40 items reveals a close alignment, for both the German (r = .94, p < .001) and the U.S. (r = .95, p < .001) samples. Men knew accurately which of the risks that they might take would be attractive to women.

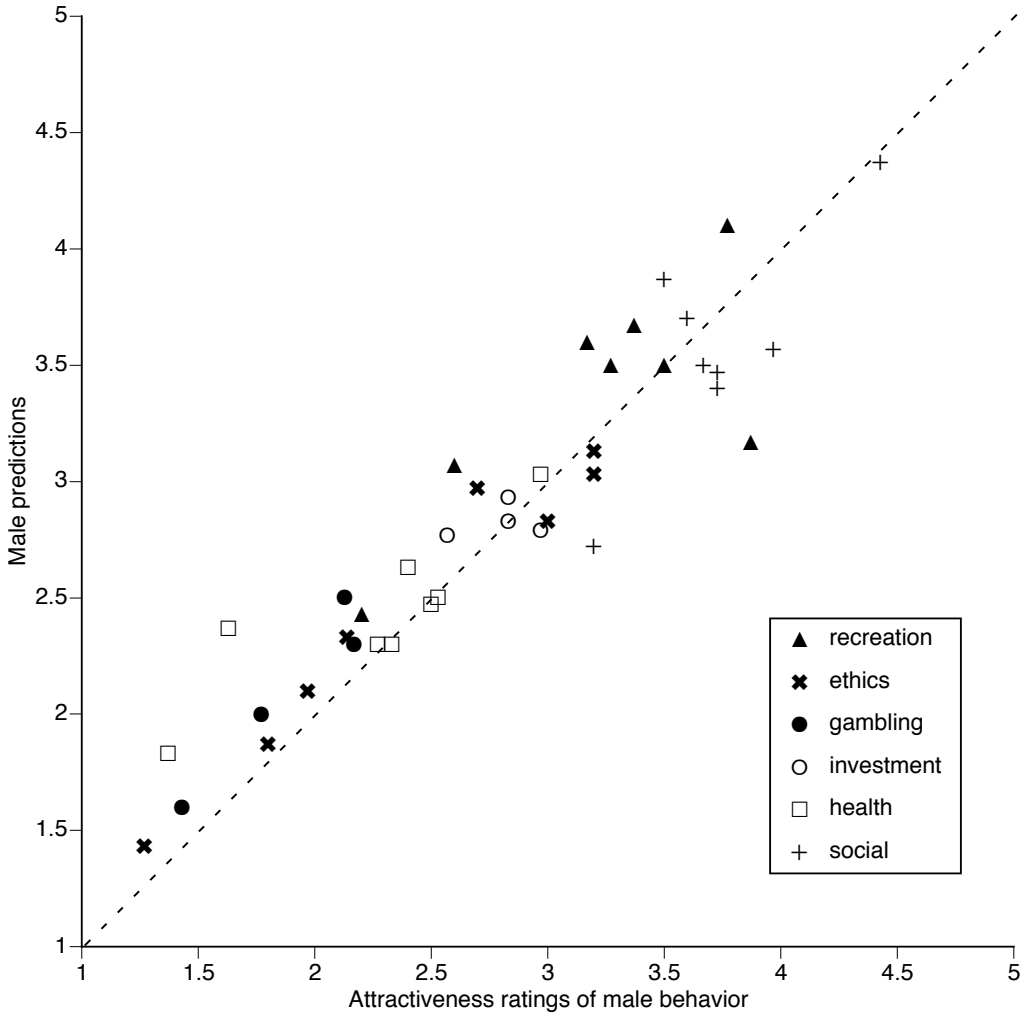

Figure 3.3 Scatterplot of ratings by women of the attractiveness of risky behaviors performed by a potential male partner, plotted against male predictions, German sample. Position relative to the dashed identity line indicates whether men overestimated or underestimated how attractive women would find each risky behavior.

Study 2: Male Ratings of Female Risk Taking

Given the close agreement between women and men on judging the attractiveness to women of male risk taking, it could be that men have a well-tuned ability to predict women's preferences even if they differ from their own. But another simpler explanation for the accuracy of men's

predictions of what women find attractive is that men and women find the same sorts of risk taking attractive, and thus men can simply estimate what women like by what they themselves like. To test this, we next examined what risk taking men find attractive in women. Male preferences are also important to assess in their own right, because mate selection in our species, where both sexes invest in parental care, often depends on mutual attraction (Trivers, 1972; Hamon & 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 the types of risk taking that are used as cues of quality to differ between the sexes.

Study 2 tested whether men and women have the same preferences for risk taking by potential mates. Sex differences in such preferences could explain the evolution of sex differences in risk taking, either through natural selection or through individual learning by experience. We also asked about women's predictions about what men find attractive. Sex differences in beliefs about what the opposite sex finds attractive could provide a proximate explanation for sex differences in risk taking, logically distinct from an explanation based on real differences in attractiveness (Farthing, 2005).

Method

Participants

Sixty new participants (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 39 undergraduate students (21 women, 18 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.

Materials and Procedure

Materials and procedure were equivalent to Study 1, except that those parts of the questionnaire instructions that dealt with how to rate the risk items were now reversed: Men rated the *attractiveness* to them of each item of female risk taking and women gave *predictions* of how attractive men would find their engagement in various domains.

Results

The same nested ANOVAs described earlier were run for pre-analysis before aggregating responses on the risk scale. The ANOVAs for men's ratings of attractiveness in both samples

were highly significant for the domain, item-within-domain, and subject factors (all $p < .001$). As in Study 1, the statistical significance of the domain factor implies consistency among items within each domain.

We compared the two conditions of our questionnaire as before by plotting male ratings of attractiveness for female risk taking alongside female predictions of how attractive they thought their risk taking is to men. Figure 3.4 shows these mean scores across all items within each domain for the German and U.S. samples and the statistical significance of the differences between mean scores and the scale midpoint. The risk taking that men found attractive in women is similar to the behavior that women found attractive in men (see Figure 3.2). In the German and U.S. samples, men reported female risk taking in the social domain as attractive ($p = .004$ and $p < .001$, respectively), whereas risk taking in the ethical ($p = .001$, $p < .001$), gambling (both $p < .001$), and health ($p < .001$, $p = .001$) domains was unattractive. As in Study 1, investment risks were not significantly attractive or unattractive (Germany: $p = .866$; U.S.: $p = .159$). Unlike in the U.S. sample for Study 1, this is also true for risk taking in the recreational domain: Men were not significantly attracted to or repulsed by women taking such risks (Germany: $p = .108$; U.S.: $p = .174$) although the tendency was still for them to be attracted.

Women were approximately as good as men in predicting what risks are attractive to the opposite sex. Comparing across items, the correlation between mean female predictions and mean male attractiveness ratings is very high for the German ($r = .94$, $p < .001$) and the U.S. ($r = .89$, $p < .001$) samples.

Figures 3.2 and 3.4 show that women and men report similar preferences for each others' risk taking. This similarity between the sexes in attractiveness of different risk taking extends also to the level of individual items (Germany $r = .94$, U.S. $r = .89$). Given the similarity of these patterns, women and men may just be stating what risks they themselves prefer when asked to predict what is attractive to the opposite sex—not necessarily exhibiting an impressive understanding of each others' desires.

This high correlation might hide a tendency for one sex to be consistently more attracted by risk taking, or for such a tendency to be present in some domains. We tested this using paired *t*-tests where each data point was an item mean. In the U.S. samples there was no significant sex difference overall, but women were significantly more attracted than men by risk taking in the recreational domain and more repulsed in the ethical and gambling domains (differences in mean scores are 0.30, 0.44, 0.35, respectively; $p = .032$, .001, .042; note that only the ethical domain remains significant after correction for multiple comparisons). In the German samples there was no significant sex difference either overall or in any individual domain (in the

recreational domain the difference is only 0.06, and in the reverse direction from the U.S. sample).

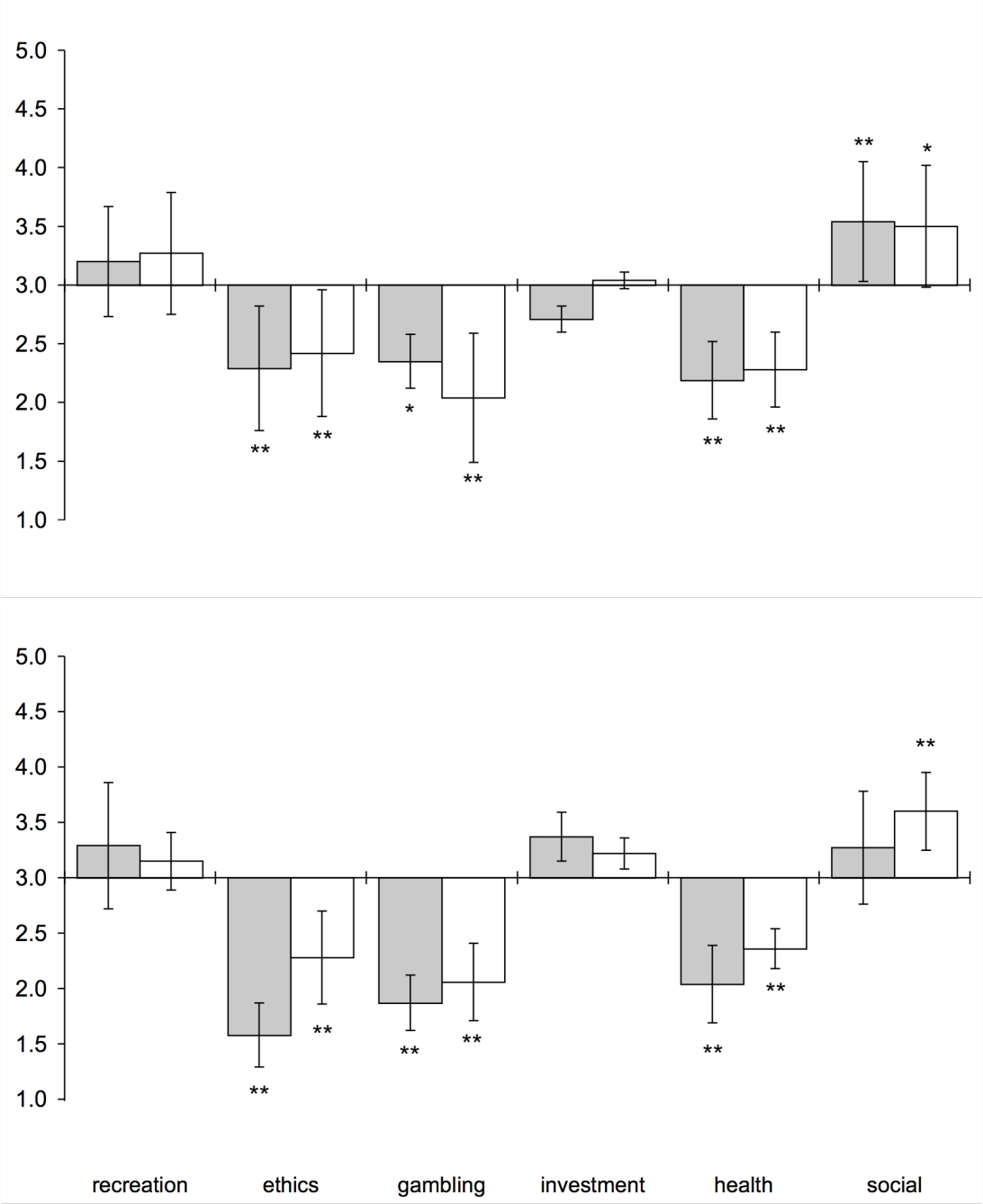

Figure 3.4 Mean domain scores (and standard deviations across items) for female predictions of the attractiveness to men of female risk taking (grey) and the corresponding actual attractiveness ratings by men of female risk taking (white) for the German (upper) and the U.S. (lower) samples; * $p < .05$, ** $p < .01$ with sequential Dunn–Šidák correction.

We also compared sex differences in the prediction of attractiveness to the opposite sex. In the U.S. samples men predicted that women would show less aversion to ethical and health risks than women predicted of men (differences 0.58, 0.42; $p < .001$, $p = .006$). In the German

samples such a difference was significant only in the health domain (difference 0.24; $p = .032$). To conclude, these sex differences can explain why 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 might differ between the sexes.

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 in this chapter 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 main possibilities. 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 to 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 afraid of 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., ethical, gambling, and health): The behaviors that a woman finds most risky (and aversive) will be particularly unattractive to her when performed by men, so women should be more attracted by men who share their risk perceptions, leading to a positive correlation in risky behaviors in these domains.

A second hypothesis that is based on mere social encounter and does not involve sexual selection points in the opposite direction in some 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 various 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. If this second hypothesis applies along with the first, it may swamp the negative correlation predicted on the basis of risk taking in the recreational and social domains being a sexually selected trait. In the other domains, both hypotheses suggest a positive correlation between couple members for their behaviors and risk perceptions, so the data will not be able to distinguish the hypotheses.

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 & 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, & Murphy, 1980). Couples positively assort on scores derived from the Sensation-Seeking Scale (Farley & Davis, 1977), and dysfunctional couples seeking marital therapy have less congruency and much lower correlations in their scores than other couples (Ficher, Zuckerman, & Neeb, 1981).

Method

Participants

Our participants were 25 young heterosexual couples who came together to the laboratory of the MPI. Couples were preselected on the criteria that they must have been together for at least 2 years and were either married, engaged, and/or living in the same apartment. Average age for women was 24 years (SD = 2) and for men 26 years (SD = 2).

Materials and Procedure

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 period of your relationship). All questionnaires were returned in sealed envelopes and remained anonymous to partner and experimenter. Participants were debriefed and paid.

Results

As in Study 1, women reported risks in the recreational and social domains as being attractive, shown in the first data column of Table 3.1. What risks women found attractive does somewhat correlate with what risks their partners took (average correlation across items: $r = .15$) and vice versa for men (average $r = .17$), which is consistent with mate choice on the basis of risk taking, although the correlations are nonsignificant. However, we need a more specific test to find out if couples also form assortatively, with men and women who agree (or disagree) on risks ending up together. To examine whether men and women in couples match in their risk attitudes in each domain, we computed Spearman correlations across all the couples, by first calculating the mean risk value per domain per person, and then within each domain, correlating female scores with the corresponding male partner scores. Table 3.1 shows these correlations within each domain for different pairings of subscales.

Table 3.1 Means and standard deviations (across subjects) of attractiveness ratings by women, and assortative pairing correlation coefficients across risk domains and risk subscales

Domain	Mean (SD) of female attractiveness ratings	Correlation between subscales		
		Male and female perception of risk	Male behavior and female behavior	Woman's perception of risk and her rating of attractiveness if partner had taken risk
Recreational	3.28 (0.34)	.25	.52*	– .55*
Ethical	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.

The between-partner correlations for perceptions of risk are displayed in the second data column of Table 3.1. Here, the "opposites attract" hypothesis predicts that perceptions of risk taking in the recreational and social domains should be negatively correlated, whereas in those domains in which risk-taking is seen as unattractive (i.e., ethical, gambling, and health) they should be positively correlated. However, domain-specific correlations for partners' risk perceptions appear mixed and none reach statistical significance: Risk perceptions in the social domain are slightly negatively correlated ($r = –.12$), whereas perceptions in the recreational

domain show a moderate positive correlation (r = .25). Likewise, whereas perceptions in the ethical and health domains correlate positively as predicted (r = .11; r = .20), partners' risk perceptions in the gambling domain appear not to be correlated (r = –.04).

The two hypotheses also predict that the pattern in correlations between partners' behaviors will be the same as between their risk perceptions. 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 = .52, p = .008 and r = .18, p = .379, respectively) as shown in the third data column of Table 3.1. This better fits the explanation from the second hypothesis ("assortative pairing") that partners with the same attitudes toward particular risks end up sharing activities that either bring them together in the first place or lead to more lasting relationships (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 (i.e., ethical, gambling, and investment domains) and only the health domain reaches statistical significance (r = .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 is 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 3.1, there is a strong negative correlation in the recreational domain (r = –.55, p = .004) and little correlation in the social domain (r = .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 = –.32, p = .120; r = –.52, p = .007; r = –.41, p = .043, respectively), 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, those women who found each type of risk more daring compared with other women's perceptions also found those risks less attractive. This prompted us to examine the corresponding relationship for 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 = –.67, p < .001) as shown in the upper left panel of Figure 3.5.

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").

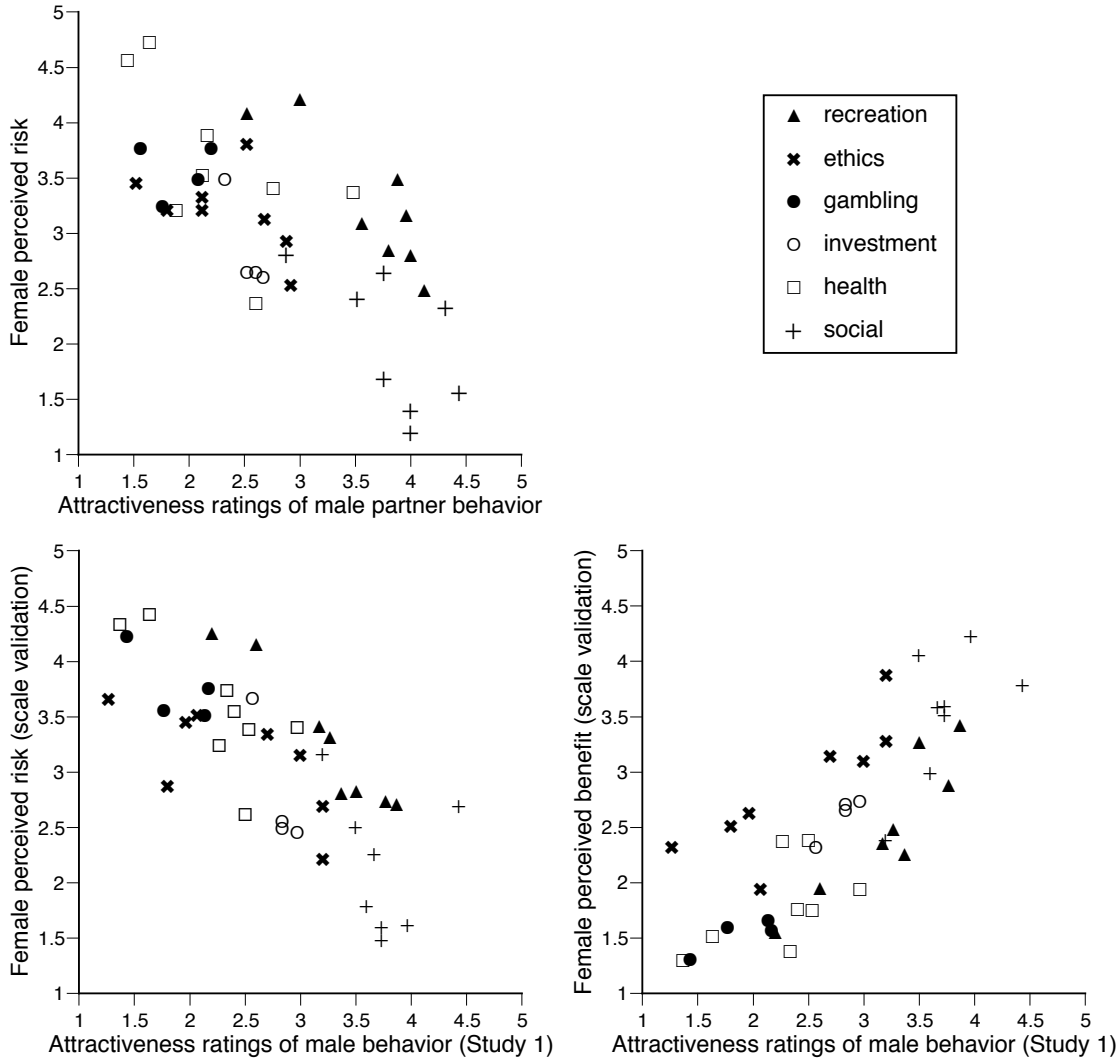

Figure 3.5 Scatterplots of female ratings of attractiveness of current male partner (above) or potential male partner (below) plotted against perceptions of risk (left) and expected benefits of particular risks (right) in the different domains. Singles data on perceived riskiness and perceived benefits (lower left and right) are taken from results of Chapter 2.

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 participants 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.

To test whether risk perceptions do change with relationship status, we also could have collected such risk perception data for the singles in Studies 1 and 2. To approximate this comparison, we took the German female and male attractiveness ratings from Studies 1 and 2 and plotted them against risk perception data taken from the German scale validation study of the domain-specific risk scale (n = 347 women, n = 185 men; see also Chapter 2). Although the latter data were collected outside of the laboratory using a different testing procedure and our results should be interpreted with caution, participants from both samples are quite comparable in terms of age range and background demographics. The lower left panel of Figure 3.5 shows this same-sex association between attractiveness ratings and perceptions of risk for 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 relationship also holds for men (r = –.71, p < .001). The similar scatterplots for couples and singles suggest that whether or not people are in a relationship, they find the least risky activities to be the most attractive.

We have so far assumed that the 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, which could explain the absence of evidence for our first hypothesis. 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 already been repeatedly reported (Alhakami & 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 also correlate with attractiveness. To investigate this possibility, we again took data from Studies 1 and 2 and plotted them against data from the German validation of the risk scale, but in this case, data on perceived benefits of risks (i.e., indicate the benefits you would obtain from each situation). The lower right panel of Figure 3.5 depicts this correlation between attractiveness ratings and perceived benefits of risk for women: The most attractive items are also those 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.

General Discussion

Our results indicate that male risk taking is attractive to women 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 earlier sections of this chapter, 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 women by demonstrating athletic ability and displaying strength (Walters & 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 the disagreement with Farthing's results is that Farthing (2005) inappropriately used the between-subjects variation when testing his mean domain scores against indifference; as we explain above, the between-item variance is what matters if one wishes to draw conclusions about physical risk taking in general rather than about just the items tested (Bart et al., 1998).

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 & Schmitt, 1993). However, although we do not have a better explanation for why risk taking in the social domain is attractive, we have some concerns about 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 highest social status often take the fewest risks socially, perhaps because they have the most to lose by a social gaffe.

Risk taking in other domains was consistently rated as unattractive (health, ethical, 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 participants). Although these dissimilarities might well be attributable to subjects' cultural

backgrounds, they could also be due to differences in demographic characteristics or testing conditions. We think of the two 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.

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. In the U.S. sample women found ethical risk taking more unattractive than did men, but this is the only such comparison yielding a convincingly significant difference. The overall similarity between the sexes may mean either that men and women learn to value the same traits (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 reliable cues to quality for both sexes. Our research cannot distinguish these two possibilities.

Both sexes are good at predicting the attractiveness of different risky activities to the opposite sex even at the level of individual items. Given the similarity of risk attractiveness ratings between the sexes, each sex might simply base its predictions for the other's preferences on its own preferences. This could be tested 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 & 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 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 the intensity of unattractive risks is even underestimated (see dashed line in Figure 3.3), which does not fit with error management theory.

Our results do not provide an adequate explanation for why young men take more risks than young women, the observation that originally stimulated this research. We did not find that women were significantly more attracted by attractive risk taking than were men, nor that men's estimates of the attractiveness of attractive risk taking to women were greater than women's estimates of its attractiveness to men. There were some quantitative sex differences in domains

where risk taking was unattractive (women found ethical risk taking less attractive than did men, and men estimated women's aversion to men taking ethical and health risks to be less than vice versa). So if humans have been selected by, or worry about, what others think when taking these unattractive risks, our results might help to explain why men take more such risks than women. Whether or not there are sex differences in attractiveness of risk taking, there remain other nonsignaling explanations for males taking more risks than females (Daly & Wilson, 1988, Chapter 8) such as males engaging in intrasexual competition with other men or men taking more risks to attract same-sex friends (Farthing, 2005).

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, recreational 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 participants preferred people 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).

Our biggest surprise was that the less risky an item was perceived to be, the more attractive it was (see Figure 3.5). Presumably a situation involving (almost) no risk would not be ultra-attractive, so there must be a reversal in this trend at lower risks 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 is important to understand what participants report when asked to rate the riskiness or benefit of a particular item. For instance, when rating riskiness, participants 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, participants 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 participants 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 participants' responses. Quite possibly not all participants are responding to the same aspects when they rate riskiness or benefit. Future studies should try to clear up these ambiguities.

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 & Fiddick, 1999), using an instrument such as Weber's 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 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. The next section pursues this idea.

Toward a Risk-taking Scale with Evolutionarily Valid Domains

From an evolutionary perspective, human risk taking should be viewed in the context of evolutionary recurrent problems of survival and reproduction. In response to the above criticisms, this short additional section illustrates our ongoing effort to incorporate variables of personal life history as well as evolutionarily valid domains into research on risk taking. For this purpose, we will look at the concept of *domain* as it is treated by evolutionary psychologists, and then learn more about the sorts of adaptive challenges that our ancestors had to face. We end this chapter by reporting first (and preliminary) results on the validation of a short risk scale that contains multiple evolutionary domains.

Evolutionary Domains of Risk

The evidence that has been collected — from the previous as well as the current chapter — argues against the notion that risk-taking is a domain-general phenomenon and shows that inter- and intraindividual differences in people's risk propensity for different content domains do exist. However, whereas Weber et al. (2002) intended their domain-specific risk scale to bring content-specificity to behavioral decision theory and to create a psychometric measurement that accounts for individual differences in risk propensity, they had no a priori theoretical reasons for the choice of their domains.

Evolutionary psychology stresses that the human mind is not a general-purpose computer but consists of a rich array of adaptations for solving evolutionarily recurrent problems. These problems (or specific selection pressures) are what define a *domain*. Like physiological adaptations, psychological adaptations evolved to solve (only) problems in particular domains and are therefore not necessarily suited for solving problems in other domains — evolutionary psychology's central tenet about domain-specificity (Cosmides & Tooby, 1994; Hagen, 2001). In his introductory text on evolutionary psychology, Buss (2004) identifies four adaptive problem domains. The first domain relates to problems of *survival* and the "hostile forces of nature" that humans had to challenge over ancestral times. Here, evolutionary scientists investigate specific adaptations for the acquisition and selection of food, finding a place to live (i.e. habitat selection), or combating predators and other environmental dangers. In the second, the *mating* domain, researchers deal with the psychological adaptations that (directly) surround reproduction. Whom do people select as mates? What mate preferences exist in the different sexes and how do they differ with regard to short-term and long-term mating goals? Challenges of *parenting* and *kinship* make up the third domain, which focuses on aspects of parental care, the tradeoffs parents face between investing in children and using their resources for other adaptive problems, and kin relations such as the investment by grandparents. The final domain deals with the adaptive problems that emerge from the fact that humans are a group-living species. Problems of *group living* encompass the forming of cooperative alliances, aggression and warfare, conflict between the sexes, and the universal cultural human feature of dominance hierarchies.

Risk-taking domains and tendencies should reflect the different types of challenges that humans faced during our evolutionary history. Therefore, we assume that risks can be viewed as variations in payoff distributions in specific domains of adaptation. We used this evolutionary viewpoint to select appropriate domains for the construction of an evolutionarily valid domain-specific risk-taking scale. Such a new risk scale could then be applied in contexts where a

functional perspective to human risk-taking is of key importance (e.g. investigating the signaling functions of risk-taking in mate choice, research on intra-sexual competition or male-female mortality ratios). Consequently, we first created a pool of questionnaire items that could be used to assess peoples' risk-taking propensity in these evolutionary content domains; we then factor analyzed the responses to our multiple-domain questionnaire to see if we could verify our prior assumptions.

Method

For the present study, we selected our risk domains in accordance with the classification of domains as described in standard evolutionary psychology texts (e.g. Cosmides & Tooby, 1994; Barrett et al., 2002; Buss, 2004) and chose the following five domains for our survey: survival and physical, mating and mate attraction, health and fertility, between-group competition, and within-group competition. Buss's (2004) domain of parenting and kinship was excluded for two reasons. First, most of our participants for the scale validation (i.e., U.S. college students) were — due to their young age — presumably not (yet) experienced in having their own offspring. Second, we thought that the effect of kinship on individuals' risk propensity would be better assessed by the actual structure of kinship relations rather than including questionnaire items for this domain. Therefore, we did include questions about the size of participants' kinship relations (e.g., how many siblings do you have?) as well as their birth order (i.e., are you the firstborn, a middle-born, or the lastborn child in the family?) in those parts of our study that dealt with participants' individual life-history (results not reported in this chapter). Buss's (2004) *group-living* domain was rearranged into two smaller sets (i.e., the between-group competition and within-group competition domains), because we considered them to be quite distinct: Within-group competition taps into social dominance, status, and leadership within one's group; between-group competition focuses on aggression and conflict.

With regard to the selection of candidate items for our actual questionnaire, we thought of two potential approaches. One was to find risky behaviors and activities within each domain that were present in ancestral times as well as still existing in modern times (e.g., avoiding eating rotten food). Another approach was to find modern-day analogues of risks that mirror risks of ancestral times (e.g., "trying to take a leadership role in any peer group you join" as an assessment for how risk prone a person is with regard to dominance hierarchies). In the study reported here, we decided to use the second approach. Although we could quite easily think of risks following the first approach for some of the domains (e.g., mating and mate attraction

risks), finding proper questionnaire items in other domains was either difficult (e.g., in the health and fertility domain) or unlikely (e.g., given the low probability of encountering survival and physical risks such as attacks from predators, falling from cliffs, etc. in modern environments).

Most initial psychometric scale development relies on a high degree of trial and error and typically does not involve testable hypotheses. Still, following on the results of chapter 2 we were able to hypothesize that (1) a factorial structure that relies on a domain-specific approach to risk taking will be superior to a domain-general approach and (2) sex differences in risk taking come out clearly with men being more risk seeking than women.

Participants

As part of a larger project on evolutionary domains of risk and the influence of life-history variables on peoples' risk propensity, a total of 693 participants from the University of South Dakota (USD; 316 females, 132 males) and the University of Michigan (UM; 131 females, 114 males) responded to an online questionnaire. The mean age for the USD sample was 21 years (SD = 4) and for the UM sample 19 years (SD = 2). Participants received course credit for their participation in the study. Data from one participant was excluded for not meeting our pre-established completeness criterion (no more than one missing response).

Materials and Procedure

To test our main questions, we had participants rate each of 25 risky behaviors for the likelihood with which they would engage in each behavior or activity. Responses were given on a 5-point bipolar scale from 1 (very unlikely) to 5 (very likely) with the scale midpoint 3 being neutral. Examples of these items are "swimming far out from shore to reach a diving platform" for the survival and physical domain, "spending a large portion of your salary to buy a sporty new convertible" for the mating and mate attraction domain, "adamantly defending the honor of your local team against a fan from a different sporting team even if it might cause a fight" for the between-group competition domain, "trying to take a leadership role in any peer group you join" for the within-group competition domain, and "participating in medical research that pays $10,000 but has some chance of making you sterile" for the health and fertility domain. Each domain consisted of 5 items. A full list of these items can be found in Appendix D.

Results

Before we conducted our main analyses, we tested whether the demographic information and the questionnaire responses significantly differed between the USD and the UM samples. Separately for males and females, we ran *t*-tests on all five domains with sample as a grouping variable. Neither the compared means nor Levene's test for the equality of variances produced any significant results. Thus, participants from the two samples were combined and analyzed together.

Table 3.2 Factor loading of 15 items of the evolutionary risk behavior scale

	Factor				
Domain and questionnaire items	1	2	3	4	5
Health and fertility					
Getting sterilized so you cannot have children but have more leisure time and more financial flexibility	**0.81**	0.04	0.01	0.08	−0.01
Exposing yourself to chemicals that might lead to birth defects for a high-paying job	**0.73**	0.09	−0.05	0.16	−0.03
Participating in medical research that pays $10,000 but has some chance of making you sterile	**0.78**	−0.02	0.01	0.13	0.05
Between-group competition					
Adamantly defending the honor of your local team against a fan from a different sporting team even if it might cause a fight	0.01	**0.66**	0.22	0.21	0.04
Sitting in the section for fans of the opposing team with a group of friends while wearing your team's colors	0.02	**0.72**	0.15	0.01	0.13
Driving to a rival university at night and stealing the school's flag from the flagpole at the center of campus	0.14	**0.73**	−0.02	0.18	0.10
Within-group competition					
Standing up to your boss in front of coworkers when your boss is being unfair	0.11	0.12	**0.68**	0.10	0.15
Trying to take a leadership role in any peer group you join	−0.10	0.08	**0.77**	−0.07	−0.03
Physically intervening between two friends who are aggressively pushing each other, to prevent a fight	−0.04	0.34	**0.43**	−0.11	0.16
Mating and mate attraction					
Spending a large portion of your salary to buy a sporty new convertible	0.10	0.22	0.30	**0.55**	−0.03
Engaging in unprotected sex during a one-night stand	0.22	0.00	−0.06	**0.73**	0.12
Maintaining long-term romantic relationships with more than one partner	0.06	0.14	−0.12	**0.70**	−0.03
Survival and physical					
Chasing a bear out of your wilderness campsite area while banging pots and pans	0.37	0.27	0.06	−0.10	**0.50**
Swimming far out from shore to reach a diving platform	0.01	0.22	−0.02	0.02	**0.76**
Exploring an unknown city or section of town	−0.12	−0.09	0.39	0.12	**0.65**

Note. Bold font indicates highest loading matches intended domain.

Exploratory principal component analyses with varimax rotations were conducted to examine whether our a priori classification of five evolutionary domains would hold. With the goal of creating a reliable and valid risk scale, we aimed at selecting only those items within each domain that provided the best factorial structure for our empirical data. The best interpretation was reached with a five-factor model containing 3 items in each domain and explained 55% of the variance. Other factorial solutions that focused only on one common factor (as domain-general approaches to risk taking would do) did not go beyond 20% of explained variance or, in the case of two or three factors, resulted in item loadings that were not interpretable. Table 3.2 shows our selection of 15 questionnaire items and their corresponding factor loadings. Our results show that the health and fertility and between-group competition domains accounted for the most variance (13.79 and 12.21%) and the survival and physical domain for the least (8.90%). As predicted, the two competition domains indeed loaded on two separate factors, that is, between-group and within-group competition.

Reliability statistics for the five domains are only moderate, but within the expected magnitude given that each domain (currently) consists of only 3 items. While responses on the health and fertility domain are the most reliable (.72), responses on the survival and physical domain are the least (.42); the average Cronbach's alpha across all five domains is .55.

Table 3.3 shows means and standard deviations of risk behavior separately for male and female respondents and for each of the five domains. In all domains, men were significantly more risk taking than women ($p < .01$ with Bonferroni correction). On average, both males and females were most likely to take risks in the within-group competition domain ($M = 3.68$ and $M = 3.51$, respectively) and in the survival and physical domain ($M = 3.29$ and $M = 2.96$, respectively). In contrast, both males and females seem to perceive risks in the health and fertility domain as most risky, because these were the risks that received the lowest responses ($M = 1.90$ and $M = 1.57$, respectively).

Table 3.3 Means (*M*) and standard deviations (*SD*) of the evolutionary risk behavior scale by sex

	N=693	
	Males (*n*=246)	Females (*n*=447)
Domain	*M* (*SD*)	*M* (*SD*)
Health and fertility	1.90 (0.84)	1.57 (0.71)
Between-group competition	2.80 (0.94)	2.49 (0.91)
Within-group competition	3.68 (0.70)	3.51 (0.72)
Mating and mate attraction	2.22 (0.83)	1.89 (0.69)
Survival and physical	3.29 (0.79)	2.96 (0.77)

Note. Male and female means are significantly different, $p < .01$, with Bonferroni correction.

Discussion

Our first results support the idea that there are separate domains of risk taking, and these domains generally follow our theoretical predictions derived from evolutionary theory. As generally reported in the risk-taking literature, men were more risk seeking across all these domains (e.g. Byrnes et al., 1999).

The current risk scale contains only 3 items per domain and can therefore only be seen as a first step toward the validation of an evolutionary domain-specific risk scale. Future studies should aim at adding extra items to the test pool to increase the number of items for each of the pre-existing domains. Including new sets of items for other domains might be another interesting addition. For instance, a foraging domain could look at risks such as tasting novel food items or the risks associated with collecting your own edibles. Once this is achieved, such a scale would need to be compared with other established scales to assess its convergent and discriminant validity. Both scales that measure risk taking and other questionnaires that assess traits related to some of our domains (e.g., aggression or sensation-seeking) would be ideal candidates for comparison.