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Ruth Sarafin
Candidate

Psychology
Department

This thesis is approved, and it is acceptable in quality and form for publication:

Approved by the Thesis Committee:

Geoffrey Miller, PhD, Chairperson

Steve Gangestad, PhD

Elizabeth Yeater, PhD

SOCIAL RISKS AS COSTLY TRAIT SIGNALS

by

RUTH SARAFIN

B.A. ANTHROPOLOGY, UNIVERSITY OF MINNESOTA, 2009

THESIS

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Like all great works, this was not a solo project, though I'm the only one lucky (unfortunate?) enough to get my name on it. So here's a huge thanks to all the usual suspects: my parents, for doing all the things parents are required by law to do, but also for being smart and valuing education and being pretty cool in general; my partner, for being the only person I don't hate most of the time; my friends, for always being supportive and encouraging; beer, for being itself; and my cat, for pretending like he doesn't hate me even though I uprooted us from our happy life to move across the country to an itty bitty apartment that's less than half the size of his old kingdom. Also thanks to my advisor, Geoffrey Miller, and committee, Steve Gangestad and Elizabeth Yeater, because I really am grateful for their help, but also because I literally could not do this without them.

SOCIAL RISKS AS COSTLY TRAIT SIGNALS

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Ruth Sarafin

B.A., Anthropology, University of Minnesota, 2009

M.S., Psychology, University of New Mexico, 2017

ABSTRACT

Costly signaling theory posits that people will sometimes engage in seemingly irrational behavior to show off attractive qualities about themselves. These behaviors may end in or incur a cost to the actor such that only individuals who are highly fit are able to succeed at the behavior, and therefore behavior success is an honest signal of fitness. Previous research has used costly signaling to explain human physical risk taking behaviors such as rock climbing, but the current study seeks to apply them to social risk taking, such as raising one's hand in class. Should social risk taking prove to be a form of costly signaling, successful risk takers should be seen as more attractive than risk avoiders, and unsuccessful risk takers should be seen as less unattractive. Participants (N=219) from the University of New Mexico read 13 vignettes about individuals who either succeed at, fail at, or avoid taking a social risk. Participants then rated the protagonist on their attractiveness as a potential friend, long term partner, and short term partner. Results indicate that while successful risk takers are indeed attractive as is consistent with costly signaling, unsuccessful risk takers are actually more attractive than risk avoiders, which is inconsistent with predictions. However, this may have been due to the wording of

vignettes and the questionable ecological validity of an obvious avoidance condition; indeed, given the apparent lack of self-confidence, an individual who obviously avoids a risk may be assumed to fail if they had taken the risk. Future studies should therefore vary the wording of this condition, as well as study the specific personality traits that are risk takers and risk avoiders are displaying in their actions.

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Introduction

The basic premise of sexual selection is simple enough: insofar as the opposite sex chooses mates, one should display qualities that the opposite sex finds attractive so they choose you. This organizational principle has guided research into both animal and human behavior and has explained the use of costly signaling, that is, a behavior (in humans) or ornament (in animals) that incurs a cost to the actor/possessor but also acts as an honest indicator of an attractive trait, such that those who use these signals gain a greater benefit in attractiveness than the cost incurred. Recent research in human mate attraction has identified physical risk taking behaviors as possible costly signals. However, many directions of this research remain untapped, and crucial questions remain answered: Do only physical risks count as costly signals, or might other risk taking types be included? Is costly signaling restricted to men, or do women engage in signaling behavior as well? Does the outcome of the risk matter to these displays? The current research seeks to answer these questions.

Non-human Mate Choice, Intrasexual Competition, and Costly Signaling

Mate choice occurs when the energetic and temporal costs of having offspring are high and the quality of available mates varies. Given these high investments, one partner, typically the higher-investing female, will seek to increase their offspring's chance of survival by choosing the "best" mate, and the other, typically a male who makes lower offspring investments, will compete to be the "best" male around. These males aim to display the qualities that females find attractive, though these displays and attractiveness assessments differ depending on the species. In some species, females are most attracted to those who can offer direct benefits such as shelter, food, or physical protection. For

example, male bowerbirds build complex nests, male katydids provision their mates with food, and male rheas vigilantly guard offspring, all of which increase the chances of offspring survival and therefore make them highly attractive to females (Fernández, & Reboreda, 2003; Gwynne, 1984; Gwynne, 1988; Mainwaring, Hartley, Lambrechts, & Deeming, 2014). In other species, females are most attracted to males of high genetic quality who will pass these fitness-enhancing genes onto offspring. The fitness advantage may be for survival (such as genes that strengthen the immune system or assist in predator avoidance) or reproduction (such as genes that make the offspring a more attractive mate). Either way, the offspring is more likely to have offspring of their own, and in that way, increase the reproductive success of the original choosy individual.

How, though, do individuals show off their genetic quality? In species with direct male competition, such as gorillas, there is an obvious winner, and through winning, the male displays his physical prowess and ability to survive (Harcourt, Stewart, & Fossy, 1981). In provisioning with direct benefits, there is a medium of comparison, such as food quantity or territory size that indicates fitness. Genetic quality, however, is assumed to be hidden.

The answer is in honest signaling, that is, the causal relationship between underlying genetic quality and possession of a physical trait. For example, male house finches have red feathers, but bacterial infections interfere with the coloring such that infected males are less brightly colored. Males with strong immune systems are able to fight off the bacterial infections, so they are brighter red. The brightness of the red, then, indicates the immune functioning (and therefore genetic quality) of the male (Balenger, Bonneaud, Sefick, Edwards, & Hill, 2015). A similar relationship between color and immune

functioning has been observed in grouse, wrens, and wild turkeys, and in barn swallows, parasite load is negatively correlated with migratory timing (Hill, Doucet, & Buchholz, 2005; Møller, de Lope, & Saino, 2004; Mougeot, Irvine, Seivwright, Redpath, & Piertney, 2004; Stutchbury, & Morton, 2008).

Many times the trait confers a cost on its possessor, so honest signaling is often called costly signaling. For example, although bright red house finches have better immune functioning and therefore more mating opportunities, their coloring also makes it easier for predators to spot them (Balenger, et.al., 2015). Similarly, species that grow elaborate weaponry for use in direct completion such as elk (antlers), rhinoceros beetles (horns), and mandrills (canine teeth) incur huge nutritional costs that cannot be used elsewhere (Leigh, Setchell, Charpentier, Knapp, & Wickings, 2008; Johnson, Bleich, & Krausman, 2007; Judge & Bonanno, 2008; Kelly, 2005; Preston, Stevenson, Pemberton, Coltman, & Wilson, 2003). Indeed, the handicap hypothesis put forth by Zahavi in 1975 posits that these traits are attractive precisely because they impose a cost. Only the fittest males can survive the costs (or handicaps), so males with these traits are signaling their genetic quality by virtue of being alive. The quintessential example is, of course, the peacock's tail, which has no benefit such as immune system functioning or increased intrasexual competitiveness, and instead appears to have evolved completely out of the peahen's preference for a handicap signaling genetic quality. However, despite the costs conferred by trait/ornament possession, these males are more reproductively successful because females preferentially mate with them.

Regardless of the type of trait, an ornament or action must meet several criteria to be considered a costly signal: (1) the signal must impose a cost on the individual, (2) the

ability to survive the cost is caused by an underlying trait or genetic quality, i.e., it is honest in that there is no way to “fake” the trait, (3) the signal is conspicuous such that others can observe it and interpret what the actor is displaying.

Intrasexual Competition and Costly Signaling in Humans

Human partner attraction is very similar to that of other species with one large difference: we have evolved to form monogamous pair bonds and because of this, men invest heavily in their partner and their offspring. This is in contrast to many animal species, wherein only females invest in offspring, and therefore, only females carefully choose partners. Indeed, human men in cultures around the world commonly invest heavily in offspring, either through direct measures, such as providing childcare, or indirect measures, such as provisioning (Apicella & Marlowe, 2004; Geary, 2000; Gray, Ellison, & Campbell, 2007; Marlowe, 1999; Winking, Gurven, & Kaplan, 2011). As a result of this high bi-parental investment, both men and women carefully assess and choose partners and compete intrasexually to secure the best possible partner. Despite this understanding, research has focused heavily on male intrasexual competition, with female intrasexual competition receiving little attention until recently.

As in all species, human mating displays are formed around what the opposite sex wants in a partner. Because men and women value slightly different qualities in partners, mating displays of the two sexes are frequently dissimilar, which may have contributed to the lack of attention given to female intrasexual competition.

For men, two of the main competition arenas have been over status and resources, as these are two characteristics that women find highly attractive in a partner. For example, men are more likely than women to get into physical conflicts, such as bar fights and

homicidal conflicts, and, on a lighter note, compete in and cheer at sporting events, all of which appear to be motived by a competition for status (Chase, & Dummer, 1992; End, Kretschmar, & Dietz-Uhler, 2004; Wilson & Daly, 1985). Mating motives also cause men to flaunt their wealth through luxury purchases, donations to charity, or gambling (Baker, & Maner, 2008; Griskevicius, Tybur, Sundie, Cialdini, Miller, & Kenrick, 2007; Iredale, Van Vugt, & Dunbar, 2008).

In contrast, because men are primarily interested in a physically attractive and virginal women, female intrasexually competition tends to be based around these norms. The most commonly used form of female competition is making oneself more attractive, thereby raising one's mate value (Fisher, Cox, & Gordon, 2009). Women wear make-up, jewelry, and sexy clothing; they tan and take diet pills; and they may even restrict their eating behavior, all in an effort to appear thin and youthful (Buss, 1988; Faer, Hendriks, Abed, & Figueredo, 2005; Hill & Durante, 2011; Li, Smith, Griskevicius, Carson, & Bryan, 2010; Schmitt & Buss, 1996). Besides self-promotion, women also engage in indirect aggression (also called social or relational aggression), which increases one's relative attractiveness by decreasing the attractiveness of rivals. These behaviors include gossiping, peer exclusion, and spreading rumors and are usually directed at other women who are likely competitors for men's attention, such as attractive or sexually available women (Archer & Coyne, 2005; Vaillancourt, 2013). Indeed, physically attractive women are much more likely to be the recipient of indirect aggression than their less attractive peers, and indirect aggression is increased against women presumed to be sexually-available (Arnocky, Sunderani, Miller, & Vaillancourt, 2012; Leenaars, Dane, & Marini, 2008; Vaillancourt & Sharma, 2011).

Some of this research, particularly those studies that have focused on men, have invoked costly signaling as explanation. For example, only wealthy men can donate substantial sums of money to charity (cost), so by doing so, they are signaling their resource holdings (attractive quality). However, the most compelling data for costly signaling in humans comes from the ethnographic work of Bliege Bird, Smith, and Bird with the Meriam of Australia (2001). They found that Meriam men often practice turtle hunting and spearfishing, though both activities offer lower caloric returns than the shellfish collecting practiced by women. Given the high time investment, low net return, yet potentially high prestige of successful hunters, individuals likely engage in these activities because successfully catching a turtle serves as a costly signal of one's physicality or intelligence. Families also participate in large displays of public generosity such as feasts, wherein the feast-givers accrue social status, though the cost of the feast in both money and time is high (Smith & Bird, 2000).

Risk Taking as a Costly Signals

Recently, research into human costly signaling has turned to risk taking behaviors. The idea is that only a fit (strong, intelligent, etc.) individual can succeed at a risk, so successful risk taking is a signal of those traits. Indeed, much of the previous work in risk taking indicates that it aligns with costly signaling expectations. Firstly, risk taking is attractive to the opposite sex, but it is not unilaterally attractive; instead, attractiveness aligns with what each sex looks for in mates (Wilke, Hutchinson, Todd, & Kruger, 2006). For example, male physical risk takers are attractive, but females physical risk takers are not, which corresponds to differences in how men and women intrasexually compete for status. Interestingly, social risk takers are attractive for both sexes, which is likely due to

both sexes' desires for kind and emotionally stable mates (Buss & Barnes, 1986). Secondly, individuals are more likely to take risks in the presence of others than they are alone, particularly when the onlooker is of the opposite sex (McAlvanah, 2009; Baker & Maner, 2008; Chen, Baker, Braver, & Li, 2000; Ronay & von Hippel, 2010), as one might expect if risk taking is a mating display. Lastly, risk propensity is not a singular personality trait as previously thought, but is highly variable within individuals depending on the type of risk taken (Blais & Weber, 2006; Blais, Weber, and Betz, 2002; Schoemaker, 1990), which again matches costly signaling expectations in that individuals are only taking risks at which they are confident they will succeed.

Thus far, research has primarily focused on male physical risk taking as costly signals, and results have been consistent with predictions. Women prefer men who are physically brave (e.g., work as a firefighter, goes rock climbing) to men without this trait and prefer physical risk takers to risk avoiders (Farthing, 2005; Farthing, 2007; Kelly & Dunbar, 2001).

However, these works leave several unanswered questions. Firstly, in all three studies, risk takers were only contrasted with risk avoiders; none of the studies delved into whether or not the risk taker must be successful to be attractive or if they were attractive merely by taking the risk. The Kelly and Dunbar study, for instance, portrayed the men as risk takers as part of their daily lives without focusing on a specific risky situation and thus presented a general expectation of success. In both Farthing studies, a person is confronted with a risky situation (e.g., defending a person from two bullies) and then either intervenes or goes to find help; no mention is made of the outcome if he does intervene. However, if risk taking is indeed a form of costly signaling, the actor should

have to succeed to be attractive (i.e., convince the bullies to leave), as only success would prove he is physically capable or intelligent enough to succeed at the risk.

Secondly, previous work only focuses on physical risk taking. However, other risk taking forms are attractive to the opposite sex, specifically social risk taking, and therefore may also serve as costly trait signals. Broadly defined, social risk taking is any action that may lead to reputational rewards or repercussions for the actor. Therefore, the potential cost and benefit is in social status. Social relationships in general require intelligence, emotional stability, and conscientiousness, so successful social risk taking may be displaying a combination of these traits.

Thirdly, only one of the studies, Kelly and Dunbar, separated attractiveness into three separate relationship types: as friends, as long term partners, and as short term partners. However, prior research has found that people prefer somewhat different characteristics in each of these relationships (e.g., Li & Kenrick, 2006). It is therefore possible that risk taking is only attractive in one relationship type; indeed, the Kelly and Dunbar study found that brave physical risk takers are preferred somewhat more as short term mates than long term mates.

Lastly, this work has been done exclusively on men, which is likely a by-product of the physical risks used (as only male physical risk takers are attractive). However, given that (1) women do compete intrasexually for the best men, (2) this competition is often through relational (social) aggression, and (3) social risks are attractive to both sexes, if risk taking is indeed a form of costly signaling, one would expect both men and women to use social risk taking to display their attractive qualities.

Moreover, this focus on male physical risk taking has ignored the deep implications that social risk taking holds for women, particularly given the strong gender bias consistently found in professional and organizational psychology (Bobbitt-Zeher, 2011). If unsuccessful risk taking holds greater costs for women than men, that is, if others view unsuccessful female social risk takers less favorably than unsuccessful male social risk takers, this may explain why women are consistently rated to have poorer problem solving and leadership skills than men and are less likely to "lean in" to inherently socially-risky careers (Bible & Hill, 2007; Cooper Jackson, 2001; Hymowitz, 2005). Given that academia also suffers from these gender biases, it may also help explain the lack of women in STEM careers (Schmitt, Branscombe, Kobrynowicz, & Owen, 2002; Steele, James, & Barnett, 2002).

Present Study

The present study seeks to fill these unanswered questions left by previous research. Specifically, it will explore social risk taking as costly signals by focusing on the final costly signaling criteria: reputational repercussions from a third party observer. If social risks are costly signals, an individual watching a social risk taker (or reading about them) should have an immediate gut reaction about their attractiveness. Participants will therefore read several short vignettes about an individual who has an opportunity to take a social risk and either succeeds, fails, or avoids the risk, after which they will rate that individual on how attractive they are as a friend, a short term partner, and a long term partner.

There are three fully crossed variables of interests in this study: risk outcome (success, failure, and avoidance), risk taker sex, and participant sex. This will allow for the

investigation of not only the main effects of outcome and risk taker sex, but help uncover possible interactions between these variables. Each vignette was written from both a male point of view and a female point of view with only the protagonist name and pronouns changed. Each vignette also has three endings: the protagonist succeeds at the risk, they fail at the risk, or they avoid the risk at the last minute. Participants will be randomly shown only one of these six forms for each vignette; they will read the vignette and rate the attractiveness of the protagonist, after which the process will repeat until they have read one form of each vignette. Analyses will be run using multi-level modeling to control for the repeated-measures design.

As an additional check of the previous research, one additional vignette will describe a physical risk. Although this is outside the main research interest, it will allow us to understand if the social risk results only hold for social risks, or if there is evidence of generalizability to other risk taking types.

Hypotheses

1) Social risks are costly signals.

    1a) Participants will rate successful risk takers as more attractive than risk avoiders across all three relationship types.

    1b) Participant will rate risk avoiders as more attractive than unsuccessful risk takers.

2) Both men and women will use social risks as costly signals, that is, hypothesis 1 will apply to both men and women.

3) Unsuccessful women will be rated as less attractive than unsuccessful men, as is consistent with previous research into gender bias.

4) Due to women's increased use of relational/indirect intrasexual competition, there will be a participant sex * protagonist sex interaction such that men will rate men and women protagonists as equally attractive, but women will rate female protagonists as less attractive than male protagonists. This will be true for all risk outcomes.

5) Physical risk will also follow the costly signaling predictions, with participants rating successful risk takers as most attractive, risk avoiders in the middle, and unsuccessful risk takers as least attractive.

Methods

Study Design

The survey was hosted on the University of New Mexico's Esurvey (Opinio) website. Participants consented to participant in the survey and filled out a brief demographic questionnaire including age, ethnicity, and relationship status, after which they were randomly assigned to one of six groups. They then read 13 vignettes (Appendix B). Twelve vignettes described an individual who has an opportunity to take a social risk, such as "raising one's hand in class;" one additional vignette described an individual who has an opportunity to take a physical risk (skiing down a difficult ski trail). Each vignette had 6 forms: two possible protagonists (male or female) fully crossed with three possible outcomes (the individual succeeds at the risk, fails at the risk, or avoids the risk). Participants only saw one form per vignette as determined by their group assignment. After each vignette, participants rated the protagonist on seven personality dimensions (agreeableness, openness to experience, conscientiousness, extraversion, neuroticism, intelligence, and sociosexuality) and attractiveness in three different contexts (as a friend, as a long-term mate, and as a short term mate) on a 0 to 10 scale (0 = not at all attractive, 10 = very attractive). If a participant did not have an emotional reaction to the protagonist, they were instructed to mark "5," the scale midpoint. The current study uses only the attractiveness ratings in analyses.

Social risks were aggregated through a literature review, particularly drawing heavily from Wilke et. al.'s (2004) cross-culturally validated questionnaire assessing risk perception and attraction. However, Wilke and colleagues wrote the risks as short, declarative sentences (e.g. "arguing with an authority figure"); they were re-written as

vignettes describing situations typical to college students (e.g., arguing with one's dad over college major) to better capture the emotional salience of the situation.

Participants

Participants were 237 students from the University of New Mexico who participated in exchange for course credit. Participants were required to be at least 18 for purposes of consent; there were no other exclusionary criteria. Ages ranged from 18 – 55, with 89% between 18 – 23. A majority (66%) were female. The majority identified as white (43%) or Hispanic or Latino (40%); other ethnic identities included Asian (4.6%), American Indian or Alaska Native (4.1%), Black or African American (3.2%), Native Hawaiian or Pacific Islander (1.8%), and other (5.5%). Students were able to identify with multiple ethnic groups, though only six chose to do so. The proportion of gender and ethnic identities is representative of the UNM participant pool; the proportion of ethnic identities is representative of New Mexico state in general.

Results

Data Screening

Of the 237 students that signed up for the survey, 18 did not answer any questions and were excluded from analyses. Missing data accounted for less than 5% of the responses on any of the three attractiveness ratings (friend = 3.8%, long-term partner = 4%, short-term partner = 4.2%) and tended to come from the same respondents, with 10 participants quitting the survey after reading only a few vignettes. Missing data was handled via deletion. Although maximum likelihood estimation or multiple imputation procedures are often recommended for handling missing data, these procedures typically rely on a 'missing at random' assumption, which could not be made here. Moreover, when used in regression analyses, deletion yields reliable parameter estimates (Kline, 2015). This left about 2500 rating instances for analyses (attractiveness as a friend = 2504, long term partner = 2501, and short term partner = 2495).

Nine participants answered every attractiveness rating (across all three types) with a "5" (the midpoint). Although these could be real scores (participants may not have had strong feelings about any vignette and thus marked "5" per instructions), this may be due to participants who were not really participating in the study but rather trying to finish the survey as quickly as possible. Sensitivity analyses were therefore run at every step in the model building process (for all three models); these analyses confirmed that exclusion of these participants did not change substantive conclusions and typically served to enlarge parameter estimates. Estimates presented in the results section include these nine participants.

All three dependent variables were leptokurtic with more people choosing “5” than any other number, but no data transformations were used due to the debate in the literature over the appropriateness of their use. Some parties (e.g., Tabachnick and Fidell, 1996) suggest that data transformations are useful to create normal distributions; others (Box & Cox, 1964; Lee Van Horn, personal communication, January 25th, 2017) suggest that data transformations assume non-linear relationships between variables and therefore should only be done in situations where this makes theoretical sense.

Vignette Check

Unweighted means for each vignette’s average attractiveness rating (averaged across all risk outcomes and both protagonists) for each relationship context are presented in Table 1 (Appendix A). As some situations were more attractive in one relationship context than another, these means are then averaged to create a general attractiveness score for that vignette situation.

Some vignettes are clearly more attractive than others. Some situations, such as arguing with one’s father, were attractive across all dependent variables, while others, such as mate switching, were much less attractive across all relationship contexts. Indeed, even one of the more “average” vignettes, sorority/fraternity elections, significantly differed from five other vignettes in attractiveness as a friend; significantly differed from seven other vignettes in attractiveness as a long term partner; and significantly differed from four other vignettes in attractiveness as a short term partner.

These differences could complicate analyses. If one vignette’s most attractive experimental condition (presumably success) is less attractive than another vignette’s least attractive condition, it may appear as if the attractiveness rating is due to the

experimental condition rather than the situation. However, removing vignettes that are significantly different from each other is inadvisable, not only because it would reduce the number of rating instances, but because the term “social risk” covers a wide variety of potential situations, and removing vignettes will limit the generalizability of the research findings. Moreover, simply adding vignette number as a fixed effect will not solve the problem, as there could be interactions between each vignette situation and one or more of the variables of interest. For example, it seems reasonable to assume that successfully approaching a stranger at the bar and getting their phone number would be less attractive in a long term mate than a short term mate, but the opposite might be true for someone who earns a place in an honors engineering program. Therefore, parameter estimates would reflect estimates for the reference vignette, not social risks in general.

To control for this issue, deviation scores, not raw attractiveness scores, were used as the dependent variable. For example, for the arguing with one’s father vignette, 6.44 was subtracted from each friend attractiveness score, 6.34 was subtracted from the long term partner scores, and 5.67 was subtracted from the short term partner scores. For the Christmas party vignette, 6.05 was subtracted from the friend scores, 5.87 was subtracted from the long term partner scores, and 5.74 was subtracted from the short term partner scores. This way, each rating is the difference above or below the average attractiveness for that situation, and the difference in average attractiveness between vignettes will not confound results. Although this approach will likely explain less residual variance than including vignette number as an additional variable, it will yield truer parameter estimates, which are the larger interest in this study. For ease of interpretation, results are converted back from deviation scores into the 10-point attractiveness scale.

As an additional investigation of the vignettes, Cohen's d effect sizes between the success and failure conditions were calculated for each vignette; results are presented in Table 2. Again, vignette results differ substantially. Two (skiing and asking for a raise) yielded consistently large effects; five (raising hand in class, mate switching, mascot stealing, sorority/fraternity elections, and rejecting sexual harassment) yielded small effects (or effects in the opposite direction). The rest yielded a mix of small – medium effects. These differences could be due to several factors, including low vignette salience, but they could also be reflective of reality. Again, no vignettes were removed due to these effect size differences.

Data Analysis

Due to the repeated measures design, analysis was run using multi-level modeling with rating instance nested within individuals (two levels). The three variables of interest (sex of the participant, sex of the vignette protagonist, and risk outcome) were included, along with all possible interactions. The participants' experimental group was not expected to influence the results; however, it was included in the initial model to test for order effects and removed once its non-significance was ascertained.

Given to the exploratory nature of the study, data analysis was completed via model building rather than traditional hypothesis testing. Although model building has been criticized for capitalizing on chance rather than working from theory, it allows for investigating a larger number of possible parameters without penalizing significant variables. In this instance, it allows for testing not only effects associated with the hypotheses of interest, but also other interesting effects that may guide future research. Exploratory models in multi-level modeling are particularly useful as they allow for the

testing of random parameters (i.e., parameters that vary across individuals). Indeed, MLM structures are frequently analyzed this way (Hox 2002; Tabachnick & Fidell, 1996). For the current study, it is unknown whether the effects of vignette conditions (the level one variables: protagonist sex, outcome) are stable or vary across individuals; indeed, uncovering significant randomness across participants will indicate a need for more explanatory participant level variables in future work, and may lead to new discoveries in how costly signaling functions in human populations.

Model building was done via a top-down approach wherein all effects (fixed and random) were initially included, with non-significant effects eliminated until a stable model appears. As standard errors for individual effects are not always trustworthy (Tabachnik & Fidell, 1996), contributing effects were assessed both by traditional significance testing and differences in model fit. Parameters were tested and eliminated (if appropriate) in the following order: 1) the survey grouping variable, 2) random effects, with non-significant effects eliminated before significant ones, 3) fixed effects, starting with non-significant interactions, significant interactions, nonsignificant main effects, and finally, significant main effects.[1]

Separate models were built for each of the three dependent variable using the attractiveness ratings for the 12 social risks. These models were then tested on the physical risk vignette to determine similarities across risk types.

Analyses were done in SPSS Mixed Model using participant ID as the grouping variable. The reference category for all models is a female participant from survey group

[1] Parameters were tested individually, but describing every step is tedious and unnecessary. To avoid inundation with unimportant "transition" models, the results section describes parameter elimination in sets, wherein change in model fit is described after the elimination of several similar parameters (ex: all three-way interactions).

6 rating a female protagonist who avoids the risk, as risk avoidance was hypothesized to be the “middle” attractiveness outcome. Parameter effects are therefore presented as deviations from this reference category. Model termination would not occur when estimating the covariance between random effects (e.g., the relationship between the intercept and a random slope). These covariance parameters were therefore fixed to 0, which allowed estimation to terminate normally.

Model building is described below with results presented in tables 3, 5, and 7. In the interest of transparency, these tables include not only parameter estimates for the final model, but estimates for other steps in the model-building process. However, not all tested models are included in the table (excluding one parameter at a time makes for many models and tediously unimportant tables). Rather, the table shows parameter estimates for three steps in the model-building process: 1) all possible effects, fixed and random, as well as the survey grouping variable, are included in the model; 2) after the removal of non-necessary random effects; 3) the final model for the dependent variable.

Friend Attractiveness Model Building

To assess the importance of a two-level model, an intercept-only model was compared to a single level model. Model fit degraded significantly (Δ (df) = 205.4 (1), $p < 0.001$). Participants accounted for 17% of the variance (0.62 for participants, 3.69 total), further underscoring the need for a multi-level model.

Experimental grouping variables. Eliminating the survey grouping variable did not affect model fit, and actually improved it slightly (-2 Restricted Log Likelihood = 9957.17, 19 parameters), so they were removed from further analyses.

Random effects. The model included three random parameters that SPSS was unable to estimate (the effect of a male protagonist, the male protagonist * success interaction, and the male protagonist * fail interaction), which typically indicates that the variances are essentially zero. Eliminating them did not change fit whatsoever, indicating that the effects of these parameters do not vary across participants. This leaves the random effects of success and failure, both of which were significant via traditional hypothesis testing (success: τ(SE) = 0.52(0.14), $p < 0.001$; failure: τ(SE) = 0.44(0.14), $p = 0.002$). Indeed, eliminating success degraded fit (Δ (df) = 22.68 (1), $p < 0.001$), as did eliminating failure (Δ (df) = 15.56 (1), $p < 0.001$), indicating that the effects of success and failure on attractiveness levels are not consistent across participants. Both random effects were therefore retained.

Fixed effects. Model building continued by eliminating non-significant interaction parameters. Removing the two three-way effects had a negligible effect on model fit (-2 Restricted Log Likelihood = 9957.76, Δ (df) = 0.59 (1), $p = 0.442$), and removing all of the two-way interactions slightly improved fit (-2 Restricted Log Likelihood = 9955.04, 9 parameters). Eliminating the main effects of a male participant and a male protagonist improved fit further (-2 Restricted Log Likelihood = 9951.95, 7 parameters) and removed all non-significant effects. The last two effects, success and failure, are both significantly random, so both will remain in the model regardless. However, the fixed effects were tested by removing the fixed portion but leaving the random. Unsurprisingly, removing the fixed effect of success degraded fit (-2 Restricted Log Likelihood = 10079.50, Δ (df) = 127.55 (1), $p < 0.001$) as did removing the fixed effect of failure (-2 Restricted Log Likelihood = 9985.65, Δ (df) = 33.70, $p < 0.001$).

Final Model. The final model therefore consists of six parameters: the intercept, success, and failure, each of which have fixed and random components, and are arranged in the following equation:

$$\text{Friend Attractiveness Rating}_{ti} = B_{0i} + B_{1i}(\text{success}) + B_{2i}(\text{failure}) + e_{ti}$$

where

$$B_{0i} = 5.31 + r_{0i}$$
$$B_{1i} = 1.20 + r_{1i}$$
$$B_{2i} = 0.58 + r_{2i}$$

Friend Results

Expected attractiveness ratings for all variable combinations can be found in Table 3 and Figure 1, which show the same information in different formats to aid the reader. For the sake of simplicity, only the fixed intercept was used in calculating the expected attractiveness ratings. Overall, including these effects reduced the residual variation from 3.07 to 2.60 – a 15% reduction.

There is significant randomness in the intercept such that estimates range from 3.83 to 6.79, i.e., participants rated the reference category (female risk avoiders) from 3.83 – 6.79. This may be due to differences in scale usage between participants, but it also may be reflective of differences in how participants view female risk avoiders. Because the level 2 predictor, participant sex, is non-significant, it is unclear what is driving these differences.

Successful risk takers and unsuccessful risk takers are more attractive than risk avoiders (b(SE) = 1.20(0.09), $p < 0.001$; b(SE) = 0.58(0.09), $p < 0.001$, respectively), with successful risk takers rating as more attractive than unsuccessful ones (b(SE) = 0.62(0.09), $p < 0.001$). The non-significant male protagonist parameter and the non-significant male protagonist * outcome interactions indicate that this is true for both male

and female protagonists; that is, men and women protagonists were rated as equally attractive at every outcome level. Similarly, the non-significant male participant effect and male participant * outcome interactions indicate that there are no sex differences in how attractive people find risk outcomes.

However, there is significant randomness in both the effects of success and failure, indicating that while overall, success and failure are more attractive than risk avoidance, participants vary considerably in how they view risk takers. Parameter estimates of success range from -0.19 to 2.59, indicating that for some participants, success is less attractive than failure and risk avoidance, but for other participants, it is up to 2.59 points more attractive than risk avoidance. Similarly, the parameter effects of failure range from -0.71 to 1.87, indicating that for some participants, failure is up to 0.71 points less attractive than risk avoidance, but for other participants, it is almost 2 points more attractive than risk avoidance. Again, the absence of cross-level interactions indicate that these differences cannot be accounted for by participant sex, i.e., men and women do not differ from each other in how they view risk outcome.

Comparison to Physical Risk Taking – Attractiveness as a Friend

These results were then compared to model building using the physical risk, skiing down a slope that is beyond your ability. In this instance, success was more attractive than failure (b(SE) = 0.93(0.28), $p = 0.001$) and risk avoidance (b(SE) = 1.06(0.30), $p < 0.001$), with failure and risk avoidance rating equally attractive (b(SE) = 0.13(0.30), $p = 0.663$). No other effects were significant.

Long Term Partner Attractiveness Model Building

The necessity of a two-level model was assessed as before, i.e., by inspection of the ICC and degradation in model fit. Differences between participants accounted by 18% of the variance in responses (total variation = 4.56, participant variation = 0.82). Elimination of the random intercept (comparison of the two-level model to the one-level model) degraded model fit (Δ (df) = 229.31 (1), $p < 0.001$), so the two level model was retained.

Experimental grouping variables. Two of the groups (2 & 4) were significantly differently from the reference group (Table 5, Model 1); however eliminating the grouping variable did not degrade model fit (Δ (df) = 7.55 (5), $p = 0.183$), so they were removed from further analyses.

Random effects. The model included one random effect that was too small to accurately estimate (fail) and two non-significant random interaction effects (male protagonist * success: τ(SE) = 0.08(0.24), $p = 0.733$; male protagonist * fail: τ(SE) = 0.17(0.23), $p = 0.467$). Eliminating them did not degrade fit (-2 Restricted Log Likelihood = 10563.52, Δ (3) = 0.66 (3), $p = 0.883$), indicating that participants do not vary in how they view these parameters, so they were removed from the model. However, the random effect of a male protagonist trended towards significance (τ(SE) = 0.21(0.12), $p = 0.082$), and eliminating it also trended towards degrading fit (-2 Restricted Log Likelihood = 10567.32, Δ (df) = 3.80 (1), $p = 0.051$). Because of the exploratory nature of the research, this parameter was accepted, indicating that participants are not consistent in how they view male protagonists in general. Lastly, eliminating the random effect of success degraded fit (-2 Restricted Log Likelihood = 10573.26, Δ (df) = 9.74, *p*

= 0.002), so it was also retained, again indicating that participants vary in their opinions of successful risk takers (Model 2, Table 5).

Fixed effects. Removing the three-way interactions did not degrade fit (-2 Restricted Log Likelihood = 10564.58, Δ (df) = 1.06 (2), p = 0.589), and eliminating the male participant * outcome interactions and the male protagonist * outcome interactions actually improved fit (-2 Restricted Log Likelihood = 10561.41, 10 parameters). However, removing the final interaction term, male participant * male protagonist did degrade fit (-2 Restricted Log Likelihood = 10567.56, Δ (df) = 6.15 (1), p = 0.013), so it was retained.

This leaves five fixed effects: the male participant *male protagonist interaction, and the main effects of a male participant, a male protagonist, success, and failure. Of these, only the male protagonist parameter was non-significant (b(SE) = 0.08(0.10), p = 0.433), and removing it slightly improved fit (-2 Restricted Log Likelihood = 10559.29). However, because this parameter is involved in an interaction term, removing it will inflate the parameter estimate of the interaction term. It therefore was retained, though it will not be interpreted. Similarly, despite the effect of a male participant being significant via traditional hypothesis testing (b(SE) = 0.37(0.18), p = 0.035), eliminating this parameter did not degrade model fit (-2 Restricted Log Likelihood = 10564.23, Δ (df) = 2.82 (1), p = 0.093). Once again, however, the presence of the male participant * male protagonist interaction term necessitates its inclusion, so this effect was retained but will not interpreted. The last two terms, success and failure, are both highly significant, and removing either degrades model fit (success: Δ (df) = 71.67 (1), $p < 0.001$; failure: Δ (df) = 8.12 (1), p = 0.004), so they were both retained.

Final model. The final model consists of two random effects, success and male protagonist, and five fixed effects, three of which are interpretable (success, failure, male participant * male protagonist interaction). The equation is:

Long Term Partner Attractiveness Rating $_{ti}$ = B_{0i} + B_{1i}(success) + B_{2i}(failure) + B_{3i}(male protagonist) + e_{ti}

where

B_{0i} = 4.94 + 0.37(male participant) + r_{0i}
B_{1i} = 0.93 + r_{1i}
B_{2i} = 0.31
B_{3i} = 0.08 – 0.50(male participant) + r_{3i}

Long Term Partner Results

Expected attractiveness ratings for all variable combinations can be found in Table 6 and Figure 2. For the sake of simplicity, only the fixed intercept was used in calculating the expected attractiveness ratings, with possible ranges due to random effects presented in brackets under the expected rating from the fixed effects. Since both success and male protagonists had significant random components, combinations involving both these parameters appear to have large plausibility ranges. A note of caution, however: the covariances between these random parameters was fixed to 0 out of necessity; in reality it is unlikely that a participant would rate a protagonist on the extremely low or extremely high end of both random effects. Estimated attractiveness levels are therefore unlikely to be as high or as low as these ranges suggest. Overall, including these effects reduced the residual variation from 3.73 to 3.41 – a 9% reduction.

Again, there was significant randomness in the intercept, with estimates ranging from 3.19 to 6.69. Because the main effect of participant sex was not deemed necessary, it is unclear what is driving these differences. Again, the inclusion of more participant level variables may elucidate these differences.

Like friend attractiveness, attractiveness as a long term partner is largely driven by the outcome of the risk. Successful risk takers are more attractive than unsuccessful risk takers (b(SE) = 0.62(0.11), $p < 0.001$) and risk avoiders (b(SE) = 0.93(0.10), $p < 0.001$), and unsuccessful risk takers are more attractive than risk avoiders (b(SE) = 0.31(0.09), $p < 0.001$). The non-significant male protagonist * outcome interactions indicate that this is true for both male and female protagonists (male and female protagonists are rated as equally attractive), and the non-significant male participant * outcome interactions indicate that there are no differences in how attractive men and women find each risk outcome.

However, the random effect of success indicates that its effects are not consistent across participants. Parameter values range from -0.33 to 2.19, meaning that for some participants, successful risk takers are 0.33 points less attractive than risk avoiders, but for others, they are over 2 points more attractive. Since the random effect of failure was not significant, we can assume that the effect of failure is consistent across participants, that is, around 0.31 points more attractive than risk avoiders and about 0.62 points less attractive than successful risk takers, though again, because of the random effect of success, the failure-success difference is not true for all participants.

Moreover, the non-significant effects of a male protagonist (b(SE) = 0.08(0.10), p = 0.433) indicate that individuals generally find male and female protagonists similarly attractive, and the non-significant male participant * outcome interactions indicate that this is true for all risk outcomes. However, because there is significant randomness in the effect of a male protagonist, participants' opinions differ considerably (-0.80 to 0.96). Some individuals find male protagonists 0.80 points less attractive than female

protagonists, and others find them almost one point more attractive. The male participant * male protagonist interaction (*b*(SE) = -0.50(0.18), *p* = 0.006) indicates that some of this variance can be explained by the sex of the participant, with men considering male protagonist as less attractive than female protagonists. However, this interaction only explains 13% of the randomness in opinions, leaving a large portion unexplained and indicating that the parameter still varies greatly after taking participant sex into account.

Comparison to Physical Risk Taking – Attractiveness as a Long Term Partner

Results were similar to but did not match the friend model. As with the social risks, women rated male and female physical risk takers as equally attractive (*b*(SE) = 0.09(0.35), *p* = 0.790). However, unlike the social risks, men rated women as significantly more attractive than did women (*b*(SE) = 0.78(0.37), *p* = 0.039), and a marginally significant interaction term in the opposite direction indicated that they rated men as slightly less attractive than did women (*b*(SE) = -1.09(0.59), *p* = 0.065). For social risks, the interaction was significant but the main effect was not, though the non-significant effects in both cases were trending towards significance.

The attractiveness of the outcomes also did not match. Again, success was more attractive than failure (*b*(SE) = 1.13(0.32), *p* < 0.001) and risk avoidance (*b*(SE) = 1.24(0.34), *p* < 0.001), but failure and avoidance were equally attractive (*b*(SE) = 0.11(0.35), *p* = 0.751).

Short Term Partner Attractiveness Model Building

Participants accounted for 17% of the variance in scores (participant variance = 0.73, total variance = 4.31), indicating the need for a multi-level model. Indeed, the

degradation in model fit comparing a two-level model to the one-level model is significant (Δ (df) = 224.03 (1), $p < 0.001$), so the two-level model was used in analysis.

Experimental grouping variable. None of the experimental survey groups were significant (Model 1, Table 7), and removing them slightly improved fit (-2 Restricted Log Likelihood = 11222.90, 19 parameters), so these parameters were removed.

Random effects. The model contained three non-significant random parameters: failure, the male protagonist * success interaction, and the male protagonist * fail interaction. Removing them did not significantly degrade fit (-2 Restricted Log Likelihood = 11225.425, Δ (df) 2.53, $p = 0.470$), indicating that participants did not vary in how attractive they found these parameters. These parameters were therefore eliminated. However, removing the random effect of a male protagonist did degrade fit (-2 Restricted Log Likelihood = 11248.88, Δ (df) = 23.45 (1), $p < 0.001$), indicating that the attractiveness of a male protagonist is not the same for all participants. Similarly, removing success also degraded fit (-2 Restricted Log Likelihood = 11265.06, Δ (df) = 39.63 (1), $p < 0.001$), indicating that people varied in how attractive they found successful risk takers. Both of these effects were therefore retained (Model 2, Table 7).

Fixed effects. Lastly, non-necessary fixed effects were removed. Neither of the three way interactions were significant, and removing them did not degrade fit (-2 Restricted Log Likelihood = 11226.99, Δ (df) = 1.56 (2), p = 0.458). Similarly, removing the male participant * outcome interactions and the male protagonist * outcome interactions did not degrade fit (-2 Restricted Log Likelihood = 11227.65, Δ (df) = 0.66 (4), $p = 0.956$), so they were also eliminated. The last interaction is the male protagonist * male participant parameter, which is highly significant (b(SE) = -0.62(0.18), $p = 0.001$).

Unsurprisingly, eliminating it did degrade fit (-2 Restricted Log Likelihood = 11237.59, Δ (df) = 9.94 (1), $p = 0.002$), so this interaction was retained.

This left one interaction term and four main effects in the model. Only one of the main effects, male protagonist, was non-significant, so this fixed portion of this effect was eliminated. Although removing it slightly improved model fit (-2 Restricted Log Likelihood = 11225.76), it was retained in the model due to its presence in the interaction effect and its significance as a random parameter. Finally, removing the effects of participant sex (-2 Restricted Log Likelihood = 11241.42, Δ (df) = 13.77 (1), $p < 0.001$), success (-2 Restricted Log Likelihood = 11296.41, Δ (df) = 68.76, $p < 0.001$), and failure (-2 Restricted Log Likelihood = 11241.26, Δ (df) = 13.91, $p < 0.001$) all significantly degraded fit, so all these parameters were retained.

Final Model. The final estimation model for short term partner attractiveness has five fixed effects (male participant, male protagonist, success, failure, and the male participant * male protagonist interaction) and two random effects (success and male protagonist).

$$\text{Short Term Partner Attractiveness Rating}_{ti} = B_{0i} + B_{1i}(\text{success}) + B_{2i}(\text{fail}) + B_{3i}(\text{male protagonist}) + e_{ti}$$

where

$$B_{0i} = 4.64 + 0.65(\text{male participant}) + r_i$$
$$B_{1i} = 0.93 + r_i$$
$$B_{2i} = 0.35$$
$$B_{3i} = 0.09 - 0.62(\text{male participant}) + r_i$$

Short Term Partner Results

Expected attractiveness ratings for short term partners within each combination of variables can be found in Table 8 and Figure 3. Again, only the fixed intercept was used, but other random effects were used to find plausible expected values. Again, the

attractiveness of both successful risk takers and male risk takers varies considerably across participants, so combinations involving these variables appear to have large plausibility ranges, though this is likely to be an artificial byproduct of the 0 covariances between these parameters. Overall, these variables only explained 14% of the residual variation, reducing it from 3.59 to 3.08.

There was significant variation in the intercept with attractiveness ratings ranging from 3.04 to 6.24. Again, this is likely due in part to differences in scale usage, but also to how participants view female risk avoiders (the reference condition). Unlike the other two attractiveness conditions, however, part of this variation can be explained by participant sex, with men rating women 0.65 points more attractive than women rate women. However, this only explains 8% of the variance. Including more participant level variables may elucidate this phenomenon.

Like the model for attractiveness as a friend and attractiveness as a long term partner, both successful and unsuccessful risk takers were more attractive than risk avoiders (b(SE) = 0.93(.10), $p < 0.001$; b(SE) = 0.35(0.08), $p < 0.001$), with successful risk takers rating more attractive than unsuccessful risk takers (b(SE) = 0.56(0.11), $p < 0.001$). The non-significant male protagonist * outcome interactions indicate that this is true for both male and female risk takers (male and female protagonists are equally attractive), and the non-significant male participant * outcome interactions indicate that men and women are similarly attracted to risk takers at every outcome level.

However, although the average participant rated a successful risk taker almost 1 point more attractive than a risk avoider, the random effect of success indicates that this is not true for all participants. In fact, the amount of variation indicates that parameter estimates

range from -0.79 to 2.65, so successful risk taking is sometimes less attractive than risk avoiding and unsuccessful risk taking, though frequently it is much more attractive than either. In contrast, the effect of failure was not significantly random, indicating that people do not vary in how attractive they find unsuccessful risk takers.

The non-significant effect of a male protagonist also indicates that women view male protagonists similarly to female protagonists. However, the main effect of a male participant (b(SE) = 0.65(0.16), $p < 0.001$) and the significant male participant * male protagonist interaction (b(SE) = -0.62(0.18), $p < 0.001$) indicates that men view male and female participants differently from each other. In fact, the estimates of both effects are nearly equal in opposite directions, indicating that men view male risk takers as similarly attractive to how women view men and women, but they view female protagonists as more attractive by over half a point. However, the male protagonist random effect indicates that their attractiveness rating varies depending on the participant, so although the average effect is essentially zero, some participants view male protagonists as 1.27 points less attractive than women, while other participants view them as 1.45 points more attractive. The fact that men generally rate men as less attractive (the significant interaction term) explains 11% of this variance, though there is still significant variation between participants even after taking this into account.

Comparison to Physical Risk Taking – Attractiveness as a Short Term Partner

Results indicated that the model for physical risk taking is highly similar to social risks. Again, women rated men and women as equally attractive (b(SE) = 0.46(0.35), p = 0.196), men rated women as significantly more attractive (b(SE) = 1.10(0.38), p = 0.004) and men as less attractive (b(SE) = -1.66(0.59), p = 0.006). Success was more attractive

than failure (b(SE) = 0.92(0.32), p = 0.004) and risk avoidance (b(SE) = 1.44(0.35), p < 0.001), but failure and risk avoidance was equally attractive (b(SE) = 0.52(0.35), p = 0.145).

Discussion

Though model building did not generally support the hypotheses of interest, it did reveal other interesting phenomena. The hypotheses and reasons for the null results are discussed before turning to these other aspects of the models. The paper ends with limitations and directions for future research.

A Priori Hypotheses

Hypothesis 1: Social risk taking is a form of costly signaling. Model building revealed mixed support for this hypothesis. One prediction, that successful risk takers will be more attractive than unsuccessful risk takers or risk avoiders, was supported in all three relationship contexts. However, a second prediction, that unsuccessful risk takers will be less attractive than risk avoiders, was not only not supported, but reversed, with unsuccessful risk takers rated as more attractive than risk avoiders in all relationship contexts. This is in direct contradiction to costly signaling. Indeed, the premise of costly signaling is that it may end poorly for the actor; if it does not, there is no cost. Despite this, the strong and consistent effects of success indicate that there is some merit to the idea that successful risk takers are displaying attractive qualities about themselves. So what's going on here?

Perhaps the unexpected reversal in attractiveness comparing unsuccessful risk takers to risk avoiders may be due to the writing of the risk avoidance condition, which was problematic in two ways: one, the avoidance outcome was a worst case, crash and burn scenario, and two, the study vignettes made clear that the protagonist had an opportunity to take a risk.

The first possibility is that the avoidance outcome was a worst case avoidance scenario where the protagonist nominally commits to the risk but then chickens out. It is possible (likely, even) that this level of avoidance could be sending a signal to onlookers that the protagonist believes they have a low likelihood of success, and therefore the participants are rating them as a low confidence failure. In contrast, unsuccessful risk takers are at least trying, and therefore may be viewed more favorably. A more neutral condition may be one where the risk is immediately eschewed by the protagonist but brushed off in such a way that does not give clues as to their probability of success.

Secondly, the ecology validity of the risk avoidance condition is questionable given that in real life, one often does not know when another has avoided taking a risk. Indeed, if social risks are a form of costly signaling and failing would lead to decreased attractiveness, a protagonist with a low chance of succeeding would likely avoid the risk all together. It is possible that to get a truly neutral risk avoidance condition, the vignette must make no mention of any possible risk taking opportunity. Future studies should compare these results of several possible risk avoidance conditions to attain a clearer understanding of the attractiveness of risk avoiders.

Hypothesis 2: Social risks are costly signals for both men and women. The attractiveness order of outcomes is the same for both men and women in all relationship contexts, with success as most attractive, failure in the middle, and risk avoidance as the least attractive. This indicates that whatever forces are in act, costly signaling or something else, it is working equally for men and women. If social risks are indeed costly signaling, this is a possible indication that social risk taking is not simply a by-product of male physical risk taking, but that both are subsumed by a larger evolutionary context.

Hypothesis 3: Failure will reflect more poorly on women than men. Models for all three relationship contexts indicate that women are not rated as less attractive than men after an unsuccessful risk. For short term partners, unsuccessful women were rated as 5.17 and unsuccessful men were rated as 5.10; for long term partners, ratings were 5.44 and 5.27, respectively; for friends, ratings were 5.89 for both men and women. In fact, women appear slightly more attractive in partner contexts, though these differences were not significant.

It is unclear why this is not the case, particularly since gender discrimination on the basis of perceived personality is a real and persistent problem (e.g., Bible & Hill, 2007; Bobbitt-Zeher, 2011; Jackson, 2001). A possible explanation is that while gender discrimination may influence perceptions of a woman's intelligence or competence, it does not influence her attractiveness levels. Perhaps because there are so many factors contributing to one's attractiveness, one social risk failure is unlikely to make a significant difference. A second possibility is that previous findings are not due to individual female protagonists being judged as less competent than male protagonists, but is instead due to wider gender generalizations: when a man fails at a social risk, that individual is rated as less attractive or capable, but when a woman fails at a social risk, women in general are rated as less attractive or capable. A study examining the perceived likelihood of success of an individual after the participant has heard of another person of that gender failing may get at this issue.

Hypothesis 4: Women will rate female protagonists less attractively than male protagonists and less attractively than men rate either male or female protagonists. This hypothesis was also not supported. In all three attractiveness contexts

and all three outcomes, women participants rated men and women as equally attractive. In fact, in partner contexts, it was men, not women, who rated women and men unequally, and it was women who were rated as more attractive. Of course, this is likely due to men's decreased ability to judge same-sex attractiveness or their increased interest in sexual relationships (e.g., Agthe, Spörrle, & Maner, 2010; Buss & Schmitt, 1993) rather than reflective of their views of social risk takers, but it does indicate that the vignettes were emotive enough to drive gender differences in perception.

However, this null finding may be due to vignette construction rather than a lack of a true effect. Previous research has found that intrasexual competition is heightened when the competitor is a local peer rather than an abstraction, such as a magazine model (Durante, Griskevicius, Hill, Perilloux,v& Li, 2011; Ferguson, Winegard & Winegard, 2011). Perhaps the women participants viewed the female protagonists as an abstract story character rather than a concrete acquaintance with whom the woman may interact. If competition was not made sufficiently salient, the women would not have rated her as less attractive. Presenting the female protagonist as an associate rather than a story character may rectify this issue. Alternatively, perhaps social risk taking is such a small part of one's attractiveness that it is not sufficient to incite peer competition.

Hypothesis 5: Physical risk also follow the costly signaling predictions, with participants rating successful risk takers as most attractive, risk avoiders in the middle, and unsuccessful risk takers as least attractive. Interestingly, this prediction was only partially upheld like the social risk results. Successful risk takers were indeed the most attractive; however, unlike social risks, failure and avoidance were equally attractive. While it is unsurprising that failure is not highly unattractive given that the

avoidance condition is subject to the same limitations of the social risk vignettes, it is curious that failure is not more attractive in this instance (like the social risk results). Perhaps this is because the cost of an unsuccessful physical risk is higher than that of an unsuccessful social risk, so even if unsuccessful risk takers are seen as more confident, this increased confidence is not sufficient to offset the foolishness of partaking in physical risk at which you are not certain you will succeed.

However, since only one physical risk (skiing beyond one's ability) was included in the study, these findings may only be true for this one specific situation. It is possible that other physical risks will not follow the same pattern.

Other Discoveries of Note

Despite these null findings, model building did reveal several interesting phenomenon. Firstly, the models for all three relationship contexts were highly similar. Secondly, there was large amounts of modeled randomness in the all three relationship contexts. Lastly, despite the significant effects discovered, the majority of variance in all three models is left largely unexplained.

Model similarities. Firstly, the fixed portions of all relationship contexts were highly similar. As previously, noted, successful and unsuccessful risk takers were more attractive than risk avoiders in all contexts, though both effects were stronger in the friend relationship than either partner context. In long and short term relationships, the effects were almost identical, with successful risk takers rating 0.93 points more attractive (on the 0-10 scale) than risk avoiders, and unsuccessful risk takers rating 0.31 or 0.35 points more attractive than risk avoiders. This is particularly interesting given that other characteristics are valued more in one romantic context than another. For example,

physical attractiveness, though prioritized in both relationships, becomes of greater importance in short term contexts (Buunk, Dijkstra, Fetchenhauer, & Kenrick, 2002); in contrast, status is less attractive in short term relationships than long term ones (Fletcher, Tither, O'Loughlin, & Friesen, 2004).

The effects of outcome in friendship were in the same direction, but both were significantly stronger for friendship than the romantic relationships. Successful risk takers were 1.2 points more attractive than risk avoiders, and an alpha-adjusted confidence interval of 1.00 – 1.40 indicates that this effect is significantly stronger for friends than either partner contexts. Similarly, the lower bound of the friend failure confidence interval is 0.38, indicating the effect of failure is also significantly more attractive on friends than partners. It is unclear why this may be the case, though it may again be due to the myriad of traits that influence attractiveness as a partner that are not at work in friend attractiveness. Perhaps success and failure have less of an effect in romantic relationships because social risk attractiveness is overshadowed by many other traits that participants find indispensable in sexual partners. In contrast, people typically demand less of their friends, so participants are more likely to rate them as attractive with limited information. However, all three contexts indicate that participants vary considerably in how they view successful risk takers, with large amounts of overlap occurring in all contexts.

The only difference between relationship contexts was the main effect of a male participant and the male participant * male protagonist interaction: the friends' equation had neither, the long term partner context only featured the interaction, and the short term partner context featured both. This may sound like a large discrepancy between the

models, but in conjunction, as they are in the short term partner model, these effects simply indicate that men view male risk takers similarly to women's perceptions of both sexes, but they rate women as much more attractive. The long term partner model, which only includes the interaction, therefore indicates that men rate women similarly to how women rate both sexes, but they rate men as less attractive. The friendship model, which includes neither, indicates that men and women view both sexes as equally attractive friends at all outcome levels.

What does this mean? Probably not a lot. Although a significant main effect of a male participant may tempt one to interpret this as an indication that men are more attracted to social risk takers than women are, it is more likely due to the phenomenon that men are generally more likely to be interested in women than vice versa (e.g., Buss & Schmitt, 1993; Clark & Hatfield, 1989). This phenomenon is particularly true of short term relationships, where men are much more likely than women to show interest in the relationship. Indeed, the difference between men's and women's ratings was nonexistent in the friends context, where men and women are equally likely to accept friends, grew slightly large in a long term relationship context, where men are somewhat more likely than women to accept partners based on limited information, and was the largest in short term relationships, where men are much more likely than women to accept sexual partners.

Overall, these similarities make it difficult to disentangle the appropriate signal receiver (i.e., is one trying to attract friends or mates?). However, as other research has found that people tend to value similar characteristics in friends and partners (Lewis, Conroy-Beam, Al-Shawaf, Raja, DeKay, & Buss, 2011), it is perhaps not that surprising

that the characteristics that make you an attractive partner make you an attractive friend. Moreover, given that social risk taking makes you an attractive social exchange partner with so many people, this would have made it a fruitful avenue for people to exploit in their quest to become more attractive partners.

Unexplained, modeled variation. All three models included some unexplained randomness: in all three models, participants varied in their opinions of successful risk takers; in friend attractiveness, participants varied in how they viewed failure; and in partner contexts, participants differed in opinions of male protagonists.

Success saw the greatest amount of variation. In the friend model, estimates ranged from -0.19 to 2.59; for long term partners, it was -0.33 to 2.19; and for short term partners, they ranged from -0.79 to 2.65. These estimates indicate that although successful risk takers are more attractive than risk avoiders in general, they are sometimes somewhat less attractive than risk avoiders and are sometimes considerably more attractive. Interestingly, this is true in all three relationship contexts. The models themselves provide no clues as to this randomness, as there are no interactions between success and the other variables of interest. One possibility lies in the situations described in the vignettes. For example, when one is judging the attractiveness of a short term partner, an individual who successfully approaches an attractive stranger at the bar is likely to be much more attractive than an individual who chickens out; when one confesses to being a virgin, however, a successful individual is not as likely to be much more attractive than a risk avoider. Another possibility is in differences in scale usage: some participants, for whatever reason, are more likely to use extreme ends of the scale, so the large variation between success and avoidance estimates may simply reflect this.

However, while it is appropriate to take these methodological and design considerations into account, it would not do to over interpret them. The wide variation in how attractive people view successful social risk taking may also be due to unexplored variables of potential interest, such as one's culture, relationship status, or age. Future studies should therefore consider these and other participant-level variables.

The random effect of failure likely is due to similar circumstances, with some situations producing stronger effects than others. It is unclear why this would only be true when one is judging a friend's attractiveness, though, and not when judging someone as a romantic partner.

Lastly, participants vary greatly in how they view male protagonists in partner contexts but not in a friendship context, although fixed parameter estimates were similar in all three (0.05 for friends, 0.08 for long term partners, and 0.09 for short term partners). Parameter estimates ranged from -0.80 to 0.96 for male long term partners and -1.27 to 1.45 for short term partners, and only a small proportion could be explained by participant sex in either case. Perhaps this variation is due to female-specific participant level variables such as relationship status or place in the ovulatory cycle, as other studies have found that single women and women in high fertility are more interested in men than partnered or low fertility women (Haselton & Gangestad, 2006; Hill & Durante, 2011). Future studies should consider these variables.

Unexplained, unmodeled variance. The last and most important thing one must note about this experiment and the models presented herein: the majority of variance in attractiveness remains unexplained, though this is not unusual in psychology studies. Yes, there were strong effects of outcome on all three dependent variables, indicating that

something is happening, yet these explanatory variables (and the highly important intercept variation) only explained 30% of the variation in friend attractiveness, 25% of the variation in long term partner attractiveness, and 29% of the short term partner attractiveness. Clearly, there are other factors at work, and social risk taking is only one small (though persistent) part of how attractive one individual is to another.

Limitations

There are several limitations to this study. The first already mentioned issue is that of the risk avoidance condition. Chickening out after a nominal commitment is but one of many ways in which an individual may avoid taking a social risk; future studies should vary this outcome to ascertain a clearer picture of the attractiveness of risk avoidance in relation to success and failure.

Secondly, social risks are often goal directed outside of attractiveness (e.g., earning a spot in an honors program), meaning that these actions are not for the sole benefit of showing off, and as such, are less "costly" than a peacock's tail. It is possible that a propensity to take these risks evolved in response to this other goal directed behavior rather than because of its effect on attractiveness. However, it is worth noting that some of the included risks were not goal directed, yet still exhibited substantial effects. For example, worrying about what to wear to a Christmas party held no ulterior goals other than making a good impression, yet the Cohen's d between success and failure was 0.58, 0.49, and 0.41 for friends, long term partners, and short term partners, respectively (Table 2). Similarly, being honest with your friends about your sexual inexperience or your sexual exploits both yielded small to medium size effects across categories, yet running in a sorority/fraternity election (a goal-directed risk that might yield benefits to

relationship partners), yielded all small effects. Although it is indeed prudent to not over extend the research to findings to suggest that risk taking evolved solely as a costly signal, it is equally imprudent to ignore the possibility. Future studies may therefore benefit from differentiating goal-directed risks from non-directed risks.

Thirdly, there is the matter of the large differences in mean attractiveness of the situations presented. While using deviation scores controlled for confounding with the variables of interest, it still likely contributed to the randomness of the parameter estimates. One possible way to avoid this issue is to have a true within-subjects design, wherein participants read and rate all possible outcomes from the same vignette. However, it would be difficult in such a design to isolate conditions sufficiently such that attractiveness rating for the first seen outcome would not “bleed over” to conflate the ratings of the following outcomes. Another possibility is to write a large number of vignettes and perform a pilot study. Vignettes could then be analyzed for similar average attractiveness, with only studies of similar attractiveness included in the main experiment.

Lastly and most importantly, this study only investigated one of the three costly signaling criteria (differential effects on attractiveness from third party observers). Future studies should delve into the actual traits on display during social risks to determine that they are indeed honest, that is, that success is inherently related to the trait, whatever it may be.

Conclusion

This study provides an important first look into the use of costly signaling in everyday, social situations. It expands upon previous research of forms of mate attraction, the use of costly signaling in human populations, and risk taking behavior by underlining the similarities between social and physical risk taking, the importance of risk outcome in attractiveness assessments, and the role of the sex of the protagonist and observers in these relationships. Successful risk takers were rated as more attractive than either unsuccessful risk takers and risk avoiders as a potential friend, long term partner, and short term partner. In the partner relationship contexts, women rated men and women protagonists as similarly attractive, but men rated women as more attractive than men. Future studies should vary the risk avoider condition to be more neutral, as well as include more participant-level variables (e.g., age, relationship status) as potential explanatory variables for the large amounts of inter-participant variation in responses.

Appendices

Appendix A: Tables and Figures

Appendix B: Study Vignettes

Appendix A: Tables and Figures

	Vignette	Friend	Long Term Partner	Short Term Partner	Average
Physical Risk	Skiing beyond one's ability	6.62	6.42	6.20	6.41
Social Risks	Arguing with one's father	6.44	6.34	5.67	6.15
	Christmas party	6.05	5.87	5.74	5.89
	Honest about inexperience	6.20	6.21	5.14	5.85
	Rejecting sexual harassment	6.10	5.82	5.20	5.71
	Honest with roommate	5.99	5.24	5.86	5.70
	Sorority/Fraternity elections	5.90	5.61	5.37	5.63
	Asking for a raise	5.93	5.59	5.26	5.59
	Approaching a stranger at the bar	5.87	5.15	5.59	5.54
	Raising hand in class	5.78	5.37	5.25	5.47
	Mascot stealing	5.66	5.01	5.16	5.28
	Engineering exam	5.37	4.95	4.55	4.96
	Mate switching	5.22	4.04	4.88	4.71
Social Risk Averages		5.89	5.43	5.31	5.54

Table 1: Average Attractiveness per Vignette

	Vignette	Friend	Long Term Partner	Short Term Partner
Physical Risk	Skiing beyond one's ability	0.52	0.58	0.50
Social Risks	Arguing with one's father	0.34	0.16	0.22
	Christmas party	0.58	0.49	0.41
	Honest about inexperience	0.36	0.19	0.38
	Rejecting sexual harassment	0.25	0.06	0.09
	Honest with roommate	0.33	0.42	0.16
	Sorority/Fraternity elections	0.26	0.24	0.17
	Asking for a raise	0.65	0.67	0.55
	Approaching a stranger at the bar	0.34	0.28	0.35
	Raising hand in class	0.01	0.16	0.12
	Mascot stealing	-0.06	0.09	-0.08
	Engineering exam	0.21	0.33	0.09
	Mate switching	0.21	0.08	0.30

Table 2: Success – Failure Effect Size (Cohen's d)

		1	2	3
Model Fit Indices	-2 Restricted Log Likelihood	9960.19	9957.17	9951.95
	parameters	24	16	7
Fixed Effects	Intercept	5.41 (0.17)	5.23 (0.12)	5.31 (0.08)
	Male Participant	0.13 (0.21)	0.14 (0.20)	-
	Male Protagonist	0.04 (0.14)	0.05 (0.14)	-
	Success	1.43 (0.15)***	1.42 (0.15)***	1.20 (0.09)***

	Failure	0.77 (0.15)***	0.76 (0.15)***	0.58 (0.09)***
	Male Participant * Male Protagonist	0.05 (0.24)	0.05 (0.24)	-
	Male Participant * Success	-0.26 (0.26)	-0.26 (0.26)	-
	Male Participant * Failure	-0.22 (0.26)	-0.22 (0.26)	-
	Male Protagonist * Success	-0.36 (0.20)	-0.37 (0.20)	-
	Male Protagonist * Failure	-0.23 (0.21)	-0.22 (0.21)	-
	Male Participant * Male Protagonist * Success	0.32 (0.35)	0.31 (0.35)	-
	Male Participant * Male Protagonist * Failure	-0.07 (0.36)	-0.08 (0.36)	-
Random Effects	Residual	2.60 (0.8)	2.60 (0.08)	2.60 (0.08)
	Intercept	0.57 (0.09)***	0.57 (0.09)***	0.57 (0.09)***
	Male Protagonist	Unable to be estimated	-	-
	Success	0.51 (0.14)***	0.52 (0.14)***	0.50 (0.14)***
	Failure	0.43 (0.14)**	0.44 (0.14)**	0.43 (0.14)**
	Male Protagonist * Succeed	Unable to be estimated	-	-
	Male Protagonist * Fail	Unable to be estimated	-	-
Grouping Variables	Group 1	-0.08 (0.36)	-	-
	Group 2	-0.30 (0.19)	-	-
	Group 3	-0.14 (0.22)	-	-
	Group 4	-0.27 (0.22)	-	-
	Group 5	-0.35 (0.26)	-	-

Table 3: Parameter Estimates for Friends Analyses. Model 1 is the fullest model, Model 2 includes all fixed effects and relevant random effects, and Model 3 is the final model.
*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

	Female Participant		Male Participant	
	Woman	Man	Woman	Man
Success	6.51 [5.12 – 7.90]	6.51 [5.12 – 7.90]	6.51 [5.12 – 7.90]	6.51 [5.12 – 7.90]
Failure	5.89 [4.60 – 7.18]	5.89 [4.60 – 7.18]	5.89 [4.60 – 7.18]	5.89 [4.60 – 7.18]
Avoid	5.31	5.31	5.31	5.31

Table 4: Expected Attractiveness Ratings for Friends

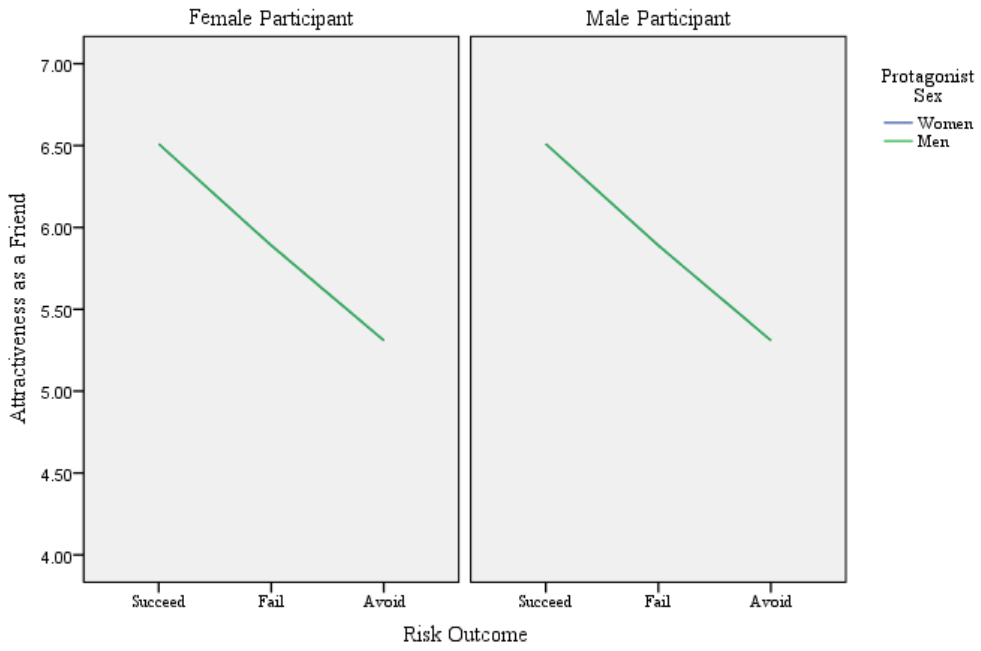

Figure 1: Expected Attractiveness as a Friend

		1	2	3
Model Fit Indices	-2 Restricted Log Likelihood	10555.31	10563.52	10561.41
	parameters	24	16	10
Fixed Effects	Intercept	5.46 (0.20)	5.02 (0.14)	4.94 (0.11)
	Male Participant	0.36 (0.24)	0.39 (0.24)	0.37 (0.18)

	Male Protagonist	-0.08 (0.16)	-0.06 (0.16)	0.08 (0.10)
	Success	0.78 (0.17)***	0.76 (0.17)***	0.93 (0.10)***
	Failure	0.26 (0.16)	0.26 (0.16)	0.31 (0.09)***
	Male Participant * Male Protagonist	-0.55 (0.28)	-0.54 (0.28)	-0.50 (0.18)**
	Male Participant * Success	0.07 (0.29)	0.07 (0.29)	-
	Male Participant * Failure	-0.10 (0.27)	-0.10 (0.27)	-
	Male Protagonist * Success	0.36 (0.23)	0.36 (0.22)	-
	Male Protagonist * Failure	0.03 (0.24)	0.05 (0.23)	-
	Male Participant * Male Protagonist * Success	-0.16 (0.40)	-0.16 (0.40)	-
	Male Participant * Male Protagonist * Failure	0.32 (0.41)	0.31 (0.40)	-
Random Effects	Residual	3.39 (0.11)	3.41 (0.11)	3.41 (0.11)
	Intercept	0.77 (0.11)***	0.81 (0.11)***	0.80 (0.11)***
	Male Protagonist	0.17 (0.13)	0.21 (0.12)	0.20 (0.12)
	Success	0.39 (0.17)	0.42 (0.16)**	0.41 (0.16)**
	Failure	Unable to be estimated	-	-
	Male Protagonist * Succeed	0.06 (0.23)	-	-
	Male Protagonist * Fail	0.19 (0.23)	-	-
Grouping Variables	Group 1	-0.40 (0.25)	-	-
	Group 2	-0.66 (0.21)*	-	-
	Group 3	-0.37 (0.25)	-	-
	Group 4	-0.76 (0.25)*	-	-

	Group 5	-0.47 (0.30)	-	-

Table 5: Parameter Estimates for Long Term Partners Analyses
*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

	Female Participant		Male Participant	
	Woman	Man	Woman	Man
Success	5.87 [4.61 – 8.06]	5.95 [3.81 – 8.09]	6.24 [5.98 – 8.43]	5.82 [3.68 – 7.96]
Failure	5.25	5.33 [4.45 – 6.21]	5.62	5.20 [4.32 – 6.08]
Avoid	4.94	5.02 [4.14 – 5.90]	5.31	4.89 [4.01 – 5.77]

Table 6: Expected Attractiveness Ratings for Long Term Partners

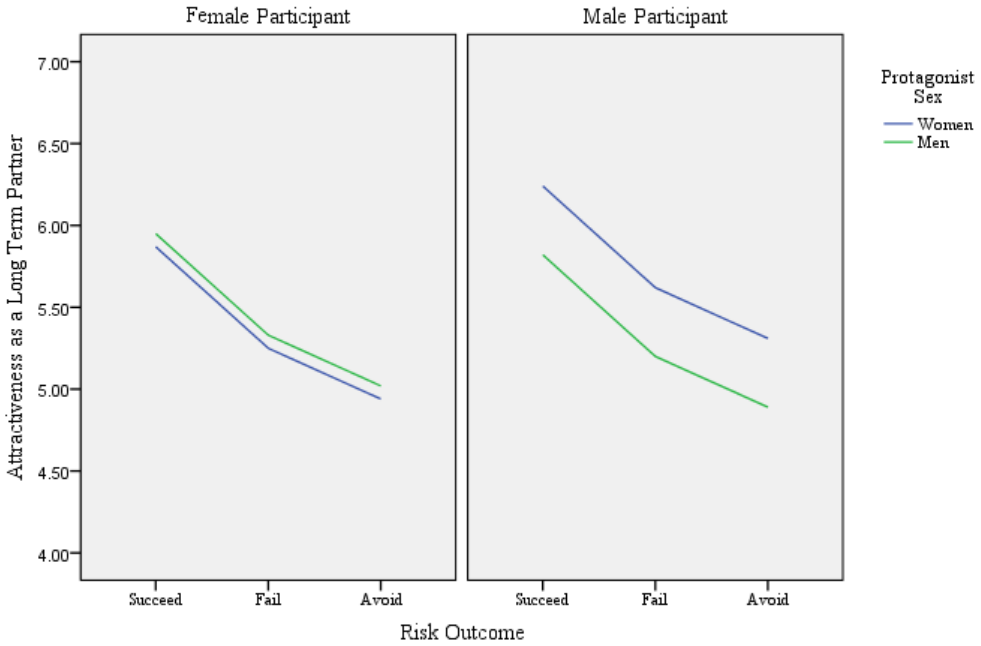

Figure 2: Expected Attractiveness as a Long Term Partner

		1	2	3
Model Fit Indices	-2 Restricted Log Likelihood	11226.62	11225.43	11227.652
	parameters	24	16	10

Fixed Effects	Intercept	4.80 (0.19)	4.73 (0.13)	4.64 (0.11)
	Male Participant	0.72 (0.22)***	0.73 (0.22)***	0.65 (0.16)***
	Male Protagonist	-0.05 (0.16)	-0.05 (0.16)	0.09 (0.10)
	Success	0.75 (0.16)***	0.75 (0.16)***	0.93 (0.10)***
	Failure	0.29 (0.15)*	0.29 (0.14)*	0.35 (0.09)***
	Male Participant * Male Protagonist	-0.87 (0.27)***	-0.87 (0.27)**	-0.62 (0.18)**
	Male Participant * Success	-0.10 (0.28)	-0.10 (0.28)	-
	Male Participant * Failure	-0.16 (0.26)	-0.16 (0.25)	-
	Male Protagonist * Success	0.36 (0.21)	0.36 (0.21)	-
	Male Protagonist * Failure	0.02 (0.22)	0.04 (0.22)	-
	Male Participant * Male Protagonist * Success	0.26 (0.37)	0.27 (0.36)	-
	Male Participant * Male Protagonist * Failure	0.54 (0.38)	0.54 (0.37)	-
Random Effects	Residual	3.02 (0.10)	3.01 (0.10)	3.08 (0.10)
	Intercept	0.68 (0.11)***	0.68 (0.10)***	0.67 (0.10)***
	Male Protagonist	0.46 (0.14)***	0.49 (0.13)***	0.48 (0.13)***
	Success	0.75 (0.18)***	0.78 (0.18)***	0.77 (0.17)***
	Failure	0.10 (0.14)	-	-
	Male Protagonist * Succeed	0.21 (0.26)	-	-
	Male Protagonist * Fail	0.14 (0.25)	-	-
Grouping Variables	Group 1	-0.03 (0.24)	-	-
	Group 2	-0.15 (0.21)	-	-

	Group 3	0.03 (0.25)	-	-
	Group 4	-0.23 (0.24)	-	-
	Group 5	0.15 (0.30)	-	-

Table 7: Parameter Estimates for Short Term Partner Analyses
*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

	Female Participant		Male Participant	
	Woman	Man	Woman	Man
Success	5.57 [3.85 – 7.29]	5.66 [2.58 – 8.74]	6.22 [4.50 – 7.94]	5.69 [2.61 – 8.77]
Failure	4.99	5.08 [3.72 – 6.44]	5.64	5.11 [3.75 – 6.47]
Avoid	4.64	4.73 [3.37 – 6.09]	5.29	4.76 [2.95 – 6.12]

Table 8: Expected Attractiveness Ratings for Short Term Partners

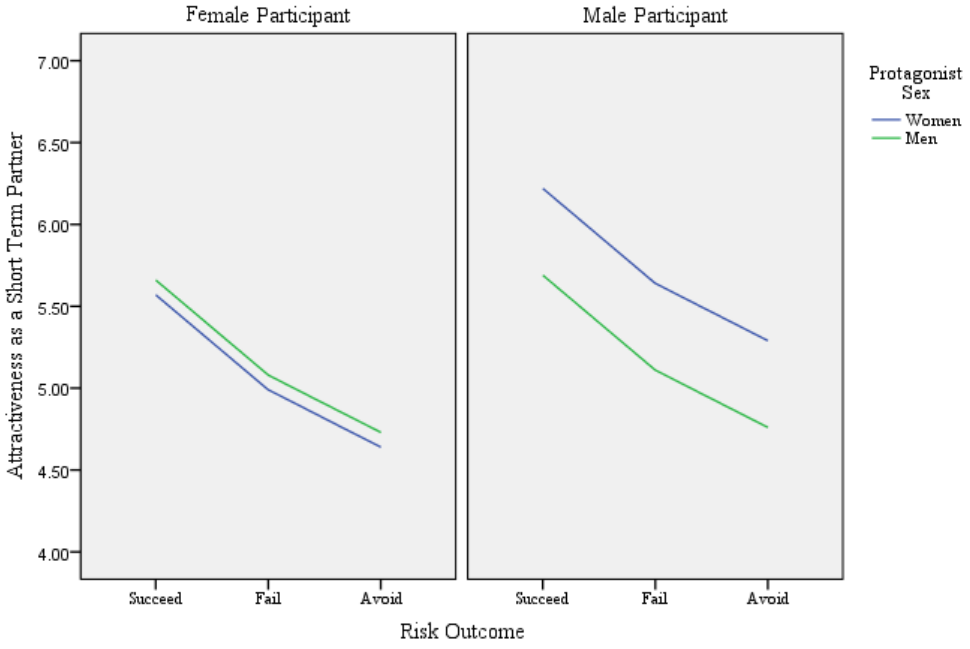

Figure 3: Expected Attractiveness as a Short Term Partner

Appendix B: Study Vignettes

Vignette 1

Emily is out with her college friends at a dive bar close to campus, which is a student favorite because of the cheap drinks. Although the bar is always packed and the floor is sticky with spilled beer, she likes it because the employees are friendly and she often runs into people she knows. Tonight Emily notices an attractive stranger across the room where he is laughing with a group of men and women. She points him out to her friends, who agree he's handsome. They bet her that she couldn't get his phone number, so she gets up and starts walking over to his table.

-If Emily goes over and starts talking with him, how likely is it that she'll get his number?

Possible outcomes:

→ Emily says hello to the man, tells him that he looks familiar, and asks if he's in one of her classes. While his friends keep talking among themselves, he and Emily talk one-on-one. After several minutes, she asks for his number, which he gives to her and asks her to call him soon. She says goodbye and grins as she heads back to her friends.

→ Emily says hello to the man, tells him that he looks familiar, and asks if he's in one of her classes. The man looks at her strangely, rolls his eyes, and says that he doesn't think so, then turns back to talk with his friends. She feels embarrassed and starts turning red as she walks back to her friends.

→As Emily approaches his table, she gets too nervous to say hi, so she veers off towards the bar and tries to act casual. She returns to her friends with new drinks and begs them not to tease her for chickening out.

Jack is out with his college friends at a dive bar close to campus, which is a student favorite because of the cheap drinks. Although the bar is always packed and the floor is sticky with spilled beer, he likes it because the employees are friendly and he often runs into people he knows. Tonight Jack notices an attractive stranger across the room where she is laughing with a group of men and women. He points her out to his friends, who agree she's pretty. They bet him that he couldn't get her phone number, so he gets up and starts walking over to her table.

-If Jack goes over and starts talking with her, how likely is it that he'll get her number?

→ Jack says hello to the woman, tells her that she looks familiar, and asks if she's in one of his classes. While her friends keep talking among themselves, she and Jack talk one-on-one. After several minutes, he asks for her number, which she gives to him and asks him to call her soon. He says goodbye and grins as he heads back to his friends.

→ Jack says hello to the woman, tells her that she looks familiar, and asks if she's in one of his classes. The woman looks at him strangely, rolls her eyes, and says that she doesn't think so, then turns back to talk with her friends. Jack feels embarrassed and starts turning red as he walks back to his friends.

→ As Jack approaches the woman's table, he gets too nervous to say hi, so he veers off towards the bar and tries to act casual. He returns to his friends with new drinks and begs them not to tease him for chickening out.

Vignette 2

Jane has worked the same office assistant job throughout college. The work is repetitive, but she enjoys it, and her boss seems to appreciate her work. However, despite Jane's loyalty and work quality, she thinks the company is underpaying her. Jane generally gets along with her boss, but her boss is prone to mood swings, and she has been harsh on employees that annoy her. Jane is worried that asking for a raise will make her angry and might even lead to her boss firing her. However, she tells her coworkers she's going to take a chance and schedules a meeting to ask for a raise.

-If Jane asks her boss for a raise, how likely is it that she'll get one?

→ At the meeting, Jane asks her boss for a raise. She is surprised and reluctant, but after several minutes of tense negotiation, she agrees to a significant raise. Jane is relieved and excited to tell her coworkers what happened.

→ At the meeting, Jane asks her boss for a raise. She is surprised and reluctant, and as Jane tries to make her case for the raise, her boss becomes upset and rejects her request. For the rest of the week, Jane worries that her boss is going to fire her, and her coworkers avoid her.

→ Jane goes into the meeting with her boss, but she becomes too nervous to ask for a raise, so she asks about the work schedule for next week instead. She later explains to her coworkers that being slightly underpaid is worth it to stay on the boss's good side.

Rick has worked the same office assistant job throughout college. The work is repetitive, but he enjoys it, and his boss seems to appreciate his work. However, despite Rick's loyalty and work quality, he thinks the company is underpaying him. Rick generally gets along with his boss, but his boss is prone to mood swings and has been harsh on

employees that annoy him. Rick is worried that asking for a raise will make him angry and might even lead to his boss firing him. However, he tells his coworkers he's going to take the chance and schedules a meeting to ask for a raise.

-if Rick asks his boss for a raise, how likely is it that he'll get one?

→ At the meeting, Rick asks his boss for a raise. He is surprised and reluctant, but after several minutes of tense negotiation, he agrees to give him a significant raise. Rick is relieved and excited to tell his coworkers what happened.

→ At the meeting, Rick asks his boss for a raise. He is surprised and reluctant, and as Rick tries to make his case for the raise, his boss becomes clearly upset and rejects his request. For the rest of the week, Rick worries that his boss is going to fire him, and his coworkers avoid him.

→ Rick goes into the meeting with his boss, but he becomes too nervous to ask for a raise, so he asks about the work schedule for next week instead. He explains to his coworkers that being slightly underpaid is worth it to stay on the boss's good side.

Vignette 3

The professor that Rachel works for throws an annual Christmas party for everyone who works in the department, including professors, postdocs, graduate students, and some fellow undergraduates. A friend who went last year tells Rachel that the house is huge and that the professor hired professional decorators and caterers for the party. Rachel is excited to attend, but she's not sure how to dress. She usually wears jeans and t-shirts in the lab, but she wants to make a better impression for the holiday party. She puts on her trendiest cocktail dress, a flashy necklace, and heels, takes a selfie, and sends it to her lab

mate to ask what she thinks. Her friend says the outfit looks great but might be a little too formal.

-If Rachel wears her dressy outfit, how likely is it that she'll make a good impression at the party?

→Rachel wears the dressy outfit to the party, and about half of the other attendees are also dressed up. Rachel feels great and is confident that she looks good. She spends the evening mingling with lots of people and gets several compliments on her outfit from other female students and a couple of cute guys.

→ Rachel wears the dressy outfit to the party, but about half of the other attendees are not dressed up. Rachel feels uncomfortable and self-conscious, so she doesn't feel like socializing very much. A couple of the other female students seem to give her critical looks, and she leaves the party feeling disappointed.

→ Rachel decides not to wear her dressy outfit and changes into something much less formal. At the party, she just talks with a few people that she already knows.

The professor that Joe works for throws an annual Christmas party for everyone who works in the department, including professors, postdocs, graduate students, and some fellow undergraduates. A friend who went last year tells Joe that the house is huge and that the professor hired professional decorators and caterers for the party. Joe is excited to attend, but he's not sure how to dress. He usually wears jeans and t-shirts in the lab, but he wants to make a better impression for the holiday party. He puts on a suit and dress shoes, takes a selfie, and sends it to one of his lab-mates to ask what he thinks. His friend says the outfit looks great, but might be a little too formal.

-If Joe wears his dressy outfit, how likely is it that he'll make a good impression at the party?

→Joe wears his suit to the party, and about half of the other attendees are also dressed up. Joe feels great and is confident he looks good. He spends the evening mingling with lots of people and gets several compliments on his clothes from other male students and a couple of cute girls.

→ Joe wears his suit to the party, but about half of the other attendees are not as dressed up. Joe feels uncomfortable and self-conscious and doesn't feel like socializing very much. A couple of the other male students seem to give him critical looks, and he leaves the party feeling disappointed.

→ Joe decides not to wear his dressy outfit and changes into something much less formal. At the party, he just talks with a few people that he already knows.

Vignette 4

Beth enrolls in a philosophy class for the upcoming semester because it fulfills a degree requirement. She's looking forward to the class even though she's heard the professor is tough. When she arrives for the first day of class, the classroom is arranged with chairs in a big circle, and most of the other 30 students seem older and more confident. The professor class begins by asking a difficult question about a controversial moral dilemma. Only a few students raise their hands, and the others uncomfortably avoid eye contact with him. Beth has an idea, but she's nervous about contributing. Still, she wants to impress her professor, so she raises her hand anyway.

-If the professor calls on Beth, how likely is it that her answer will impress him?

→The professor calls on Beth and she gives her answer in a few short sentences. He nods his head while she's speaking, tells her she made a great point, and encourages the rest of the class to expand upon it. Beth is glad that she made a good first impression and didn't embarrass herself on the first day.

→ The professor calls on Beth and she gives her answer in a few short sentences. He tells her that her idea isn't very logical or relevant and asks other students to identify what is wrong with it. Beth is embarrassed that she made such a poor first impression.

→ The professor calls upon some other students first, and their answers intimidate Beth, so she puts her hand down. She doesn't want to embarrass herself on the first day. The professor doesn't seem to notice.

Eric enrolls in a philosophy class for the upcoming semester because it fulfills a degree requirement. He's looking forward to the class even though he has heard the professor is tough. When he arrives for the first day of class, the classroom is arranged with chairs in a big circle, and most of the other 30 students seem older and more confident. The professor begins class by asking a difficult question about a controversial moral dilemma. Only a few students raise their hands, and the others uncomfortably avoid eye contact with him. Eric has an idea, but he's nervous about contributing. Still, he wants to impress his professor, so he raises his hand anyway.

-If the professor calls on Eric, how likely is it that his answer will impress him?

→The professor calls on Eric and he gives his answer in a few short sentences. He nods his head while he's speaking, tells him he made a great point, and encourages the rest of

the class to expand upon it. Eric is glad that he made a good first impression and didn't embarrass himself on the first day.

→ The professor calls on Eric and he gives his answer in a few short sentences. He tells him that his idea isn't very logical or relevant and asks other students to identify what is wrong with it. Eric is embarrassed that she made such a poor first impression.

→The professor calls on some other students first, and their answers intimidate Eric, so he puts his hand down. He doesn't want to embarrass himself on the first day. The professor doesn't seem to notice.

Vignette 5

Ella is starting her sophomore year majoring in engineering. Her school has a competitive honors engineering program for juniors and seniors, and joining the program opens many doors for employment after college. Ella tells her friends that she hopes to get in. However, the program requires a grueling four-hour entrance exam at the end of the year. Ella studies for the exam several hours a week in addition to keeping up in her classes. The morning of the test, she's very nervous about her chances and regrets telling her friends her goal. To add to her anxiety, the test will take place in the large lecture hall right after a regular class period. All her classmates will see if she sticks around to take it, and if she doesn't get in, they'll know that she failed.

-If Ella takes the exam, how likely is it that she'll be admitted to the honors program?

→Ella decides to take the exam, and she is thrilled to find out that she did well enough to earn a spot in the program. She immediately calls her friends to tell them the good news, and she can't wait to see who else in her class got in.

→Ella decides to take the exam, but she is upset to find out she didn't score well enough to earn a spot in the program. She's embarrassed about what her friends and classmates will think when they find out she failed.

→ At the last minute, Ella decides not to take the exam. She tells herself that she can still get a good education and a decent job in engineering without joining the honors program, but she's embarrassed about what her friends will think when they ask how they did.

Andy is starting his sophomore year majoring in engineering. His school has a competitive honors engineering program for juniors and seniors, and joining the program opens many doors for employment after college. Andy hopes to get in, and he tells his friends. However, the program requires a grueling four-hour entrance exam at the end of the year. Andy studies for the exam several hours a week in addition to keeping up in his classes. The morning of the test, he's very nervous about his chances and regrets telling his friends his goal. To add to his anxiety, the test will take place in the large lecture hall right after a regular class period. All his classmates will see if he sticks around to take it, and if he doesn't get in, they'll know that he failed.

-If Andy takes the exam, how likely is it that he'll be admitted to the honors program?

→Andy decides to take the exam, and he is thrilled to find out that he did well enough to earn a spot in the program. He immediately calls his friends to tell them the good news, and he can't wait to see who else in his class got in.

→Andy decides to take the exam, and he is upset to find out he didn't score well enough to earn a spot in the program. He's embarrassed about what his friends and classmates will think when they find out he failed.

→ At the last minute, Andy decides not to take the exam. He tells himself that he can still get a good education and a decent job in engineering without taking part in the honors program, but he's embarrassed about what his friends will think when they ask how he did.

Vignette 6

Kelsey is in her sophomore year of college. She is currently pre-med, but she's recently decided that she wants to change to pre-law because law and politics fascinate her. Unfortunately, Kelsey's dad is a doctor and expects her to become one, too, so he's agreed to pay her college tuition only if she studies pre-med. She discusses it with her sister, and tells her that she's going to talk with dad about changing majors when she sees him over Thanksgiving at their grandmother's house. However, her extended family will also be there, which makes Kelsey nervous about raising the subject. She hopes to talk with her dad one-on-one later in the evening, but her grandmother asks during dinner whether she's still enjoying pre-med.

-If Kelsey announces that she wants to change her major to pre-law, how likely is it that she can convince her dad to continue paying for college?

→Kelsey tells the family that she wants to change majors. Her father is angry and wants her to keep studying medicine, but she explains her reasons for wanting to study law and politics, and convinces him to continue paying for school. Kelsey is excited she was able to change his mind and shares a grin with her sister.

→ Kelsey tells the family that she wants to change majors. Her father is angry and wants her to keep studying medicine. Kelsey explains her reasons for wanting to study law and

politics, but her father won't change his mind, and says he'll stop paying for school if she changes majors. Kelsey wishes she hadn't said anything, and her sister looks disappointed in her.

→ Kelsey feels put on the spot and is too worried about her dad's reaction to talk about changing majors. She sidesteps the question by saying that her biology class is interesting and then asks her sister if she took any biology in college.

Matt is in his sophomore year of college. He is currently pre-med, but he's recently decided that he wants to change to pre-law, because law and politics fascinate him. However, Matt's dad is a doctor and expects him to become a doctor, too, so he's agreed to pay his college tuition only if he studies pre-med. Matt discusses it with his brother, and tells him that he's going to talk to dad about changing majors when he sees him over Thanksgiving at their grandmother's house. However, his extended family will also be there, which makes Matt nervous about raising the subject. He hopes to talk with his dad one-on-one later in the evening, but his grandmother asks during dinner whether he's still enjoying pre-med.

-If Matt announces that he wants to chance his major to pre-law, how likely is it that he can convince his dad to continue paying for college?

→Matt tells the family that he wants to change majors. His father is angry and wants him to keep studying medicine, but Matt explains his reasons for wanting to pursue law and politics, and convinces him to continue paying for school. Matt is excited he was able to change his mind, and he shares a grin with his brother.

→ Matt tells the family that he wants to change majors. His father is angry and wants him to keep studying medicine. Matt explains his reasons for wanting to pursue law and politics, but his father won't change his mind, and says he'll stop paying for college if Matt changes majors. Matt wishes he hadn't said anything, and his brother looks disappointed in him.

→ Matt feels put on the spot and is too worried about his dad's reaction to talk about changing majors. He sidesteps the question by saying that his biology class is interesting and then asks his brother if he took any biology in college.

Vignette 7

Sarah and her boyfriend have been together for two years. They're comfortable together, her family likes him, and they've talked about getting married. Recently, though, she has worried that her boyfriend is a bit boring and humorless, and she's developed a crush on her biology lab partner, who is funny, smart, and attractive. Sarah thinks he has feelings for her, but she's not sure, and she's worried about ending her stable relationship for something uncertain. However, she decides she wants to pursue a relationship with her lab partner and tells her roommates that she's going to break up with her boyfriend and see if her lab partner is interested in going out.

-If Sarah breaks up with her boyfriend, how likely is it that her lab partner will want to date her?

→Sarah breaks up with her boyfriend and tells her lab partner the next day after lecture. The following week, she asks him out for a drink, and he accepts. They have a great time together and immediately make plans to see a concert the following weekend. After

several weeks, they become Facebook official. Sarah tells her roommates the good news and is happy that she decided to end her other relationship.

→ Sarah breaks up with her boyfriend and tells her lab partner the next day after lecture. The following week, she asks him out for a drink, and he accepts. Sarah has a good time and thinks that he does, too. However, when she asks him to go to a concert with her the next weekend, he tells her he's not interested in her romantically and just wants to be friends. Sarah is devastated and embarrassed to tell her roommates. She wishes she hadn't broken up with her boyfriend.

→Sarah decides not to break up with her boyfriend and stops hanging out with her lab partner. Her roommates ask her why she's staying with her boyfriend, and she tells them that she realized how much she loves him and she wants to try to make it work with him. However, she's disappointed in herself for playing it safe.

Adam and his girlfriend have been together for two years. They're comfortable together, his family likes her, and they've talked about getting married. Recently, though, he has worried that his girlfriend is a bit boring and humorless, and he's developed a crush on his biology lab partner, who is funny, smart, and attractive. Adam thinks she has feelings for him, but he's not sure, and he's worried about ending his stable relationship for something uncertain. However, he decides that he wants to pursue a relationship with his lab partner, and tells his roommates that he's going to break up with his girlfriend and see if his lab partner is interested in him.

-If Adam breaks up with his girlfriend, how likely is it that his lab partner will want to date him?

→Adam breaks up with his girlfriend and tells his lab partner the next day after lecture. The following week, he asks his lab partner out for a drink, and she accepts. They have a great time together and immediately make plans to see a concert the following weekend. After several weeks, they become Facebook official. Adam tells his roommates the good news and is happy that he decided to end his other relationship.

→ Adam breaks up with his girlfriend and tells his lab partner the next day after lecture. The following week, he asks her out for a drink, and she accepts. Adam has a good time and thinks she does, too. However, when he asks her to a concert the following weekend, she tells him she's not interested in him romantically and just wants to be friends. Adam is devastated and embarrassed to tell his roommates. He wishes he hadn't broken up with his girlfriend.

→Adam decides not to break up with his girlfriend and stops hanging out with his lab partner. His roommates ask him why he's staying with his girlfriend, but he tells them that he realized how much he loves her and that he wants to make it work with her. However, he's disappointed in himself for playing it safe.

Vignette 8

Lydia is in her senior year of high school. She and her friends passionately support their school's football team and are excited for the homecoming game against their rival. Last year, a couple of students from the rival school broke in to their stadium and spray-painted insults on the field, so Lydia and her three friends want to get back at them. They decide to steal the rival team's mascot costume, and they nominate Lydia to plan the theft. The tricky part is that the mascot costume is stored in a locked shed behind the rival

school, and sometimes the police patrol the area. Lydia devises a plan with lookouts, bolt cutters, and a getaway driver. They drive over to the neighboring school, but as they approach, Lydia starts worrying about the police patrols and possible arrest.

-If Lydia and her friends go through with the plan, how likely is that they can steal the rival team's mascot costume without getting caught?

→Lydia decides to go through with the plan. She and her friend cut the lock, sneak into the shed, and grab the costume. The lookout texts everyone that a police car is approaching the shed, so they sprint back to the getaway car. The driver speeds away, and they make it back to her house without anyone following. Lydia is elated they got away with it and can't wait to see their rivals' faces at the game the next night.

→Lydia decides to go through with the plan. She and her friend cut the lock, sneak into the shed, and grab the costume. Unfortunately, she didn't place the lookouts in the best spots, so nobody sees the police car approaching the shed. The cops catch everyone and alert their school. The principal suspends them for a week and bans them from attending the homecoming game. Lydia feels guilty and embarrassed about her poor plan.

→ Lydia decides it's too risky to steal the costume, so they circle the block and head back home. She feels like a chicken after planning everything, and her friends seem disappointed, but it feels a lot riskier here, and she's worried about getting caught.

George is in his senior year of high school. He and his friends passionately support their school's football team and are excited for the upcoming homecoming game against their rival. Last year, a couple students from the rival school broke in to their stadium and spray-painted insults on the field, so George and his three friends want to get back at

them. They decide to steal the rival team's mascot costume, and they nominate George to plan the theft. The tricky part is that the mascot costume is stored in a locked shed behind the rival school, and sometimes the police patrol the area. He devises a plan with lookouts, a bolt cutter, and a getaway driver. They drive over to the neighboring school, but as they approach, George starts worrying about the police patrol and possible arrest.

-If George goes through with the plan, how likely is that they will steal the mascot costume without getting caught?

→George decides to go through with the plan. He and his friend cut the lock, sneak into the shed, and grab the costume. The lookout texts everyone that a police car is approaching the shed, so they sprint back to the getaway car. The driver speeds away, and they make it back to his house without anyone following. George is elated they got away with it and can't wait to see their rivals' faces at the game the next night.

→George decides to go through with the plan. He and his friend cut the lock, sneak into the shed, and grab the costume. Unfortunately, he didn't place the lookouts in the best spots, so nobody sees the police car approaching the shed. The cops catch everyone and alert their school. The principal suspends them for a week and bans them from attending the homecoming game. George feels guilty and embarrassed about his poor plan.

→George decides it's too risky to try to steal the costume, so they circle the block and head back home. He feels like a chicken after planning everything, and his friends seem disappointed, but it feels a lot riskier here, and he's worried about getting caught.

Vignette 9

Angela is starting her junior year of college and has been a member of her sorority since freshman year.

She was chair of the social committee last year and plans to do it again until she finds out that last year's president is stepping down, and she starts thinking about running for president instead. However, she hears that one of the most popular seniors is also planning to run. Angela talks to her best friend about it, and she encourages her to run anyway. The next evening, the sisters gather in the great room for the start of the year meeting. Last year's president starts the meeting by asking for nominations for president. Another girl nominates the popular senior, who accepts, and is asked to give a speech about her plans for the house. After the speech, the former president asks for other nominations. Angela's friend nominates her, but when everyone turns to Angela to see if she'll accept the nomination, she gets very nervous.

-If Angela accepts the nomination and gives a speech about her plans, how likely is it that she'll win the sorority presidency?

→Angela accepts the nomination. She gives a speech about her plans for the house, and the sisters vote soon after. Angela wins and shares a smile with her best friend. She is thrilled, but also slightly incredulous that she was able to beat one of the most popular girls in the house.

→Angela accepts the nomination. She gives a speech about her plans for the house, and the sisters vote soon after. Angela doesn't win, and she's embarrassed that she tried going up against one of the most popular girls in the house. Her best friend looks disappointed in her, and she hopes the other girls don't think poorly of her.

→Angela is too nervous to accept the nomination, so she thanks her friend, but says she'd rather continue being social chair. Her friend looks annoyed, and Angela is disappointed in herself, but she doesn't want to run in case she loses.

Nick is starting his junior year of college and has been a member of his fraternity since freshman year. He was chair of the social committee last year and plans to do it again until he finds out that last year's president is stepping down, and he starts thinking about running for president instead. However, he hears that one of the most popular seniors is also planning to run. Nick talks to his best friend about it, and he encourages him to run anyway. The next evening, the brothers gather in the great room for the start of the year meeting. Last year's president starts the meeting by asking for nominations for president. Another guy nominates the popular senior, who accepts, and is asked to give a speech about his plans for the house. After the speech, the former president asks for other nominations. Nick's friend nominates him, but when everyone turns to Nick to see if he'll accept, he gets very nervous.

-If Nick accepts the nomination, how likely is it that he'll win the fraternity presidency?

→Nick accepts the nomination. He gives a speech about his plans for the house, and the brothers vote soon after. Nick wins and shares a smile with his best friend. He is thrilled, but also slightly incredulous that he was able to beat one of the most popular guys in the house.

→Nick accepts the nomination. He gives a speech about his plans for the house, and the brothers vote soon after. Nick doesn't win, and he's embarrassed that he tried going up

against one of the most popular guys in the house. Hi best friend looks disappointed in him, and he hopes the other guys don't think poorly of him.

→Nick is too nervous to accept the nomination, so he thanks his friend, but says he'd rather continue being social chair. His friend looks annoyed, and Nick is disappointed in himself, but he doesn't want to run in case he loses.

Vignette 10

Justina is a month into her freshman year of college. Her roommate is a friend from high school, and she's made friends with the other girls in her dorm, but most of them know each other from high school, so she feels a little like an outsider. She hears that they're going to a party on Saturday, and she's hoping they'll invite her. They're hanging out in one of the girl's dorm rooms on Thursday, and the other girls start talking about sex. Justina doesn't think she has as much experience as everyone else, and she's worried they'll think she's immature or weird and won't invite her to the party. When another girl asks her about the craziest thing she's done, Justina isn't sure if she should be honest about her lack of experience. However, her roommate knows the truth, so she doesn't want to lie in case she hears about it.

-If Justina is honest about her lack of sexual experience, how likely is it that the other girls will invite her to the party?

→Justina tells the truth that she only had one boyfriend in high school and that they didn't sleep together. The other girls are cool with it, and later that night, mention that she should come with them to the party. Justina is glad that she was honest and that they're not judging her for her lack of experience.

→Justina tells the truth that she only had one boyfriend in high school and that they didn't sleep together. The other girls look at her like she's crazy, and Justina wishes she hadn't said anything. Nobody invites her to the party, and she feels awkward and uncomfortable the rest of the evening.

→Justina says she doesn't want to share specifics. Her friends tease her a bit, but they don't pester her for details, and eventually start talking about other things. Justina still hopes they'll invite her to the party.

Will is a month into him freshman year of college. His roommate is a friend from high school, and he has made friends with the other guys in his dorm, but most of them know each other from high school, so he feels a little like an outsider. He hears that they're going to a party on Saturday, and he's hoping they'll invite him. They're hanging out in one of the guy's dorm room on Thursday, and the other guys start talking about sex. Will doesn't think he has as much experience as everyone else, and he's worried they'll think he's immature or weird and won't invite him to the party. When another guy asks him about the craziest thing he's done, Will isn't sure if he should be honest about his lack of experience. However, his roommate knows the truth, so he doesn't want to lie in case he hears about it.

-If Will is honest about his lack of sexual experience, how likely is it that the other guys will invite him to the party?

→Will tells the truth that he only had one girlfriend in high school and that they didn't sleep together. The other guys are cool with it, and later that night, mention that he

should come with them to the party. Will is glad that he was honest and that they're not judging him for his lack of experience.

→Will tells the truth that he only had one girlfriend in high school and that they didn't sleep together. The other guys look at him like he's crazy, and Will wishes he hadn't said anything. Nobody invites him to the party, and he feels awkward and uncomfortable the rest of the evening.

→Will says he doesn't want to share specifics. Him friends tease him a bit, but they don't pester him for details, and eventually start talking about other things. Will still hopes they'll invite him to the party.

Vignette 11

Zoe joins her friend's co-ed flag-football team during her junior year of college even though she doesn't know anyone on the team besides her friend. She has a great time at her first game, and she is flattered when the team captain, an attractive and popular senior, flirts with her. However, he drinks a lot at the bar after the game and starts making jokes about how he hopes that the girls on the other team are better in bed than they are on the field. Everyone else laughs, but Zoe rolls her eyes because she thinks it's crude and not very funny. The team captain sees her reaction and comments that if she was getting any action, she probably wouldn't be so uptight. She wants to tell him he's acting like a jerk and get him to apologize, but she's worried everyone will think she's too sensitive.

-If Zoe tells him he's being rude, how likely is it that he'll apologize?

→Zoe tells him he's being rude and that he shouldn't make stupid sexual comments about people he's just met. He looks surprised that she called him out, but he apologizes. Later, Zoe's friend and another teammate thank her for calling him out.

→Zoe tells him he's being rude and that he shouldn't make stupid sexual comments about people he's just met. He looks surprised that she called him out. He doesn't apologize, tells her to stop being so touchy, and continues to make sexual comments. Later, Zoe's friend tells her she's being over sensitive.

→Zoe decides she doesn't want to call him out, so she tells him that she was rolling her eyes at something on the tv behind him. She's a little ashamed that she didn't call him out for being a jerk, but she's worried everyone will think she's too touchy.

Chris's joins his friend's co-ed flag football team during his junior year of college even though he doesn't know anyone on the team besides his friend. He has a great time at his first game, and he is flattered when the team captain, an attractive and popular senior, flirts with him. However, she drinks a lot at the bar after the game and starts making jokes about how she hopes that the guys on the other team are better in bed than they are on the field. Everyone else laughs, but Chris rolls his eyes because he thinks it's crude and not very funny. The team captain sees his reaction and comments that if he was getting any action, he probably wouldn't be so uptight. He wants to tell her she's acting like a jerk and get her to apologize, but he's worried everyone will think he's too sensitive.

-If Chris tells her he's being rude, how likely is it that she'll apologize?

→Chris tells her she's being rude and that she shouldn't make stupid sexual comments about people he's just met. She looks surprised that he called her out, but she apologizes. Later, Chris's friend and another teammate thank him for calling her out.

→Chris tells her she's being rude and that she shouldn't make stupid sexual comments about people she's just met. She looks surprised that he called her out. She doesn't apologize, tells him to stop being so touchy, and continues to make sexual comments. Later, Chris's friend tells him he's being over sensitive.

→Chris decides he doesn't want to call her out, so he tells her that he was rolling his eyes at something on the tv behind him. He's a little ashamed that he didn't call her out for being a jerk, but he's worried everyone will think he's too touchy.

Vignette 12

Nicole is approaching the end of her first year of college, and she's hoping to live with her roommate again the following year because they get along great. The only downside is that her roommate is religious and very traditional when it comes to men and dating, and Nicole is often worried that her roommate judges her for being more sexually adventurous. One evening, Nicole is over at a classmate's apartment studying for their chemistry exam. With finals week upon them, adrenaline is high, and they end up sleeping together. Nicole feels good about it and texts a friend to tell her, but she isn't sure if she should tell her roommate. Unfortunately, when she joins her friends for breakfast the next morning, her roommate asks her what she was doing out so late last night.

-If Nicole tells her roommate about sleeping with her classmate, how likely is it that she'll want to live together next year?

→Nicole tells her friends that she slept with a classmate and that it was a lot of fun. Her roommate says she's glad that Nicole had a good time, and later that day, says she really hopes they can live together again next year. Nicole is happy that she's able to be honest with her roommate even though they have different beliefs.

→ Nicole tells her friends that she slept with a classmate and that it was a lot of fun, but her roommate gives her a judgmental look. Later that day, she says she'd prefer to live with a friend from church. Nicole is disappointed and wished she hadn't said anything.

→Nicole doesn't want to tell her roommate about sleeping with her friend, so she just says they were studying late. Her friend who knows the truth rolls her eyes, but Nicole thinks her roommate won't approve, and she really wants to make sure she gets a good roommate again next year.

Zach is approaching the end of his first year of college, and he's hoping to live with his roommate again the following year because they get along great. The only downside is that his roommate is religious and very traditional when it comes to women and dating, and Zach is often worried that his roommate judges him for being more sexually adventurous. One evening, Zach is over at a classmate's apartment studying for their chemistry exam. With finals week upon them, adrenaline is high, and they end up sleeping together. Zach feels good about it and texts a friend to tell him, but he isn't sure if he should tell his roommate. Unfortunately, when he joins his friends for breakfast the next morning, his roommate asks him what he was doing out so late last night.

-If Zach tells his roommate he slept with his classmate, how likely is it that she'll want to live together next year?

→Zach tells his friends that he slept with a classmate and that it was a lot of fun. His roommate says he's glad that Zach had a good time, and later that day, says he really hopes they can live together again next year. Zach is happy that he's able to be honest with his roommate even though they have different beliefs.

→ Zach tells his friends that he slept with a classmate and that it was a lot of fun, but his roommate gives him a judgmental look. Later that day, he says he'd prefer to live with a friend from church. Zach is disappointed and wished he hadn't said anything.

→Zach doesn't want to tell his roommate about sleeping with his friend, so he just says they were studying late. His friend who knows the truth rolls his eyes, but Zach thinks his roommate won't approve, and he really wants to make sure he gets a good roommate again next year.

Vignette 13

Charlie and his new girlfriend are spending the day skiing at a local ski resort, which is packed with people enjoying the sunny, chilly day. His girlfriend is a great skier, but Charlie has only been a few times and is still learning. He loves it, though, and wants to try his skills on the difficult black diamond run. The run is very narrow and full of sharp turns and steep hills, and unlike the other runs, it cuts through the trees. As they ride up the ski lift together for their final run, Charlie tells her that he wants to try it. She encourages him to go for it, so with the sun setting behind them, they head over to the black diamond trail.

-If Charlie tries the difficult run, how likely is it that he will successfully complete it?

→ Charlie tells his girlfriend to wish him luck and pushes off down the run. Though the trail is challenging, he is able to stay on his feet and loves every minute of it. His girlfriend follows him down the trail. When they reach the bottom, she compliments him for doing so well. Charlie is proud of himself and glad he didn't make a fool of himself in front of her or the other skiers.

→ Charlie pushes off down the run. He is exhilarated, but the trail is incredibly difficult. He misses one of the final hairpin turns, wildly careens off the trail, and falls head over heels. His girlfriend follows him down the trail, so she sees him fall and rushes over to help. Although he didn't seriously injury himself, he's embarrassed that he fell in front of his girlfriend and the other skiers.

→Charlie teeters at the top of the slope, but decides at the last minute to do a slightly easier run instead. His girlfriend is disappointed they're not doing the black diamond run together, but Charlie explains that since it's the last run of the day, he wants to be safe and make it a good one.

Olivia and her new boyfriend are spending the day skiing at a local ski resort, which is packed with people enjoying the sunny, chilly day. Her boyfriend is a great skier, but Olivia has only been a few times and is still learning. She loves it, though, and wants to try her skills on the difficult black diamond run. The run is very narrow and full of sharp turns and steep hills, and unlike the other runs, it cuts through the trees. As they ride up the ski lift together for their final run, Olivia tells him that he wants to try it. He

encourages her to go for it, so with the sun setting behind them, they head over to the black diamond trail.

-If Olivia tries the difficult run, how likely is it that she will successfully complete it?

→ Olivia tells her boyfriend to wish her luck and pushes off down the run. Though the trail is challenging, she is able to stay on her feet and loves every minute of it. Her boyfriend follows her down the trail. When they reach the bottom, he compliments her for doing so well. Olivia is proud of herself and glad she didn't make a fool of herself in front of him or the other skiers.

→ Olivia pushes off down the run. She is exhilarated, but the trail is incredibly difficult. She misses one of the final hairpin turns, wildly careens off the trail, and falls head over heels. Her boyfriend follows her down the trail, so he sees her fall and rushes over to help. Although she didn't seriously injury herself, she's embarrassed that she fell in front of her boyfriend and the other skiers.

→Olivia teeters at the top of the slope, but decides at the last minute to do a slightly easier run instead. Her boyfriend is disappointed they're not doing the black diamond run together, but Olivia explains that since it's the last run of the day, she wants to be safe and make it a good one.

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