



Confirming preferences or collecting data? Information search strategies and romantic partner selection

Michael H. Hennessy , Marty Fishbein , Brenda Curtis & Daniel Barrett

To cite this article: Michael H. Hennessy , Marty Fishbein , Brenda Curtis & Daniel Barrett (2008) Confirming preferences or collecting data? Information search strategies and romantic partner selection, Psychology, Health & Medicine, 13:2, 202-221, DOI: [10.1080/13548500701246010](https://doi.org/10.1080/13548500701246010)

To link to this article: <https://doi.org/10.1080/13548500701246010>



Published online: 19 Mar 2008.



Submit your article to this journal [↗](#)



Article views: 108



View related articles [↗](#)



Citing articles: 1 View citing articles [↗](#)

Confirming preferences or collecting data? Information search strategies and romantic partner selection

MICHAEL H. HENNESSY¹, MARTY FISHBEIN¹, BRENDA CURTIS¹, & DANIEL BARRETT²

¹*Public Policy Center, Annenberg School for Communication, University of Pennsylvania, Philadelphia, Pennsylvania, USA, and* ²*Department of Psychology, Western Connecticut State University, Danbury, Connecticut, USA*

Abstract

This article investigates two kinds of information search strategies in the context of selecting romantic partners. Confirmatory searching occurs when people ask for more information about a romantic partner in order to validate or confirm their assessment. Balanced searches are characterized by a search for risk information for partners rated as attractive and for attractiveness information about partners rated as risky in order to attain a more complete evaluation. A factorial survey computer program randomly constructed five types of partner descriptions and college-age respondents evaluated nine descriptions in terms of both health risk and romantic attractiveness outcomes. The results show little evidence of balanced search strategies: for all vignette types the respondents searched for attractiveness information. Regression analysis of the search outcomes showed no difference between males and females in the desire for attractiveness or risk information, the amount of additional information desired, or the proportion of descriptions for which more information was desired. However, an attractive physical appearance did increase the amount of additional information desired and the proportion of vignettes for which more information was desired. The results were generally inconsistent with a balanced search hypothesis; a better characterization of the respondents' strategy might be "confirmatory bias."

Keywords: *Confirmation bias, risk assessments, sexual partner selection*

In a pair of recent studies, Fishbein and his colleagues investigated how young adults identify and evaluate social and behavioral cues relevant to the selection of a romantic partner (Fishbein, Hennessy, Yzer, & Curtis, 2004; Hennessy, Fishbein, Curtis, & Barrett, in press). The research was motivated in part by prior work indicating that persons believe they can assess romantic partner cues to maximize positive relationship outcomes while simultaneously identifying cues to personality characteristics and specific social behaviors that reduce their risk of HIV or STD infection (Gold, Skinner, Grants, & Plummer, 1991; Keller, 1993; Maticka-Tyndale, 1991; Van der Velde, Van der Pligt, & Hooykaas, 1992, 1994; Williams et al., 1992). The use (but not efficacy) of these cues has been validated in experimental and survey studies (Agocha and Cooper, 1999; Clark, Miller, Harrison, Kay, & Moore, 1996; Dijkstra, Buunk, & Blanton, 2000) and the experimental evidence seems consistent with behavioral epidemiological data that show that persons engage in "safer sex"

with sex partners they perceive as “risky” and do not engage in “safer sex” with sex partners that are perceived as “safe” (Fishbein and Jarvis, 2000; Gebhardt, Kuyper, & Greunsvan, 2003; Misovich, Fisher, & Fisher, 1997; Montano, Kasprzyk, von Haefen, & Fishbein, 2001; Peterman et al., 2000; Rhodes and Malotte, 1996).

In the first study (Fishbein et al., 2004), young adults evaluated 159 characteristics of a potential romantic partner in terms of romantic attractiveness and health risk. For example, they rated characteristics such as self-confident, happy with myself, dependent, is a good listener, has tattoos, or wants to spend quiet evenings together. The gamma between average risk and average attractiveness evaluations for the 159 aspects was $-.61$, suggesting that the more one is attracted to some aspect of a potential partner, the less likely is one to view that aspect as “risky.” A strength of the paper was the use of an extensive list of possible cues to risk and attractiveness. However, the design did not permit respondents to judge a potential partner’s risk and attractiveness in the face of contradictory cues: the respondents were never asked to make a decision assessing attraction or risk when more than a single piece of information was available.

The second paper (Hennessy et al., in press) addressed this question via the factorial survey method by constructing descriptions of hypothetical romantic partners using both risky and attractive characteristics. There were four types of romantic partner descriptions: those consisting of highly attractive and low-risk aspects, those of high-risk and low-attractiveness aspects, those first presenting highly attractive and low-risk aspects but ending with high-risk and low-attractiveness aspects, and those first presenting high-risk and low-attractiveness aspects and ending with highly attractive and low-risk aspects. All respondents evaluated five of each vignette type in terms of riskiness to one’s sexual health, romantic attractiveness, likelihood of going on a date, of having unprotected sex, and of becoming infected with HIV or another STD if they did have unprotected sex.

Vignette type made a large difference in elevating or depressing the outcome evaluations. This was not particularly surprising in the extreme cases of high-attractiveness/low-risk and high-risk/low-attractiveness descriptions but the results implied that the differences between the “conflicting information” descriptions were attributable to a primacy effect (Hovland, 1958; Ohanian & Cunningham, 1987): descriptions that began with attractiveness information but ended with risk information were evaluated as more attractive than those that began with risk information and ended with attractive aspects. The opposite pattern was seen for the risk outcomes. Participant gender also predicted romantic partner evaluations. Males were less risk averse than females when confronted with risk dominated descriptions but were equivalent to females when evaluating attractiveness dominated ones. This is consistent with prior research on gender differences in reported sexual behavior (Hoyle, Fejfar, & Miller, 2000).

The research reported here again uses a factorial survey approach, this time designed to investigate the information search methods used by the respondents after decisions about the potential romantic partner were made. Specifically, this paper investigates the use of confirmatory versus balanced information searches in the context of romantic and sexual partner selection. Confirmatory searching occurs when, after a judgment about a potential partner is made, respondents ask for more information *in order to validate or confirm the initial judgment* (Jonas et al., 2001). Thus, testing or challenging the initial hypothesis of risk or attraction based on additional data is avoided and searching for information consistent with the initial decision is the goal. In contrast, a balanced search strategy would be defined by searching for risk information about attractive partners and for attractiveness information about high-risk partners *in order to collect a more complete picture of the potential partner*. In the context of personal advertisements or interactions on the internet, we might expect balanced

information searches to be common given the assumption that persons looking for romantic partners tend to advertise their attractive characteristics and tend to avoid disclosing those that might lead to a negative initial reaction.

The present research also extends the earlier studies in three other ways. First, it includes an explicit physical “appearance” factor in the romantic partner descriptions. Other studies (e.g., Agocha & Cooper, 1999) have compared the effects of appearance (either via photographs or descriptions) to other features of hypothetical partners. By including an appearance factor in the descriptions used here, the effects of physical appearance can be compared with those of personality and behavior. A second difference is that in this study, the mixed vignettes more evenly distribute the attractive and risky features in the description (see below for more details). This change may attenuate the order effect observed in the earlier studies because it reduces the difference between parts of the romantic partner description. Finally, we include here a non-informative vignette that was a constant for all respondents and had essentially no information relevant to either risk or attractiveness. A non-informative description is useful for determining what sort of information about potential partners is sought when there are no potentially biasing effects of previous information.

Research questions

1. *What are the effects of vignette type, gender and physical appearance on judgments of health risk, attractiveness and the likelihood of dating, having sex, and becoming infected?*

- (A) **Vignette type:** Based on our earlier findings, vignettes with consistent attractiveness and risk information should produce the most disparate outcomes, whereas the inconsistent partner descriptions should produce intermediate values. Because our previous study showed that order of the information was important, we expect that inconsistent vignettes which begin with attractive characteristics will result in higher averages for attractive outcomes and in lower averages for risk outcomes compared to those which begin with risk characteristics. However, given the revised approach to presenting risk and attractiveness aspects in the same vignette the order effects found in the earlier paper may be reduced or eliminated. We are uncertain about the neutral descriptions. If they are truly information free, we might expect them to be difficult to assess in terms of risk or attractiveness and therefore receive values at about the median. However, because no risk aspects are used in their construction, neutral descriptions could be evaluated by the respondents as “reabeled” or “disguised” versions of attractive descriptions. In this case, they should be evaluated similarly to the attractive descriptions. Note that although the risk and attractiveness judgments are not the central concern of this study, they are important to analyze because they demonstrate whether or not the vignette types were effective in their role as treatment manipulations and because the revised format of the risk and attractiveness information may attenuate the differences between vignette types that we observed earlier.
- (B) **Gender:** Because males are less risk averse than females, we expect that males will be more attracted to and be more likely to date and have sex with potential partners compared with females. At the same time, males will see potential partners as less risky and as less likely to infect them than will females. Based on our previous research, however, we expect the differences between males and females to be greatest with respect to “risky” partners and smallest with respect to “attractive” partners. That is, we expect gender to interact with vignette type.

- (C) Physical appearance: We expect that both men and women will be more attracted to, and will be more likely to want to date and have sex with potential partners described as “attractive” than as “average” in appearance. More specifically, we expect that the more physically attractive the potential partner, the less the attention paid to “risky” characteristics. Thus we expect both a main effect of appearance as well as an interaction between appearance and vignette type.

2. *What are the effects of vignette type, gender, and physical appearance on information search strategies?*

- (A) Vignette type: Balanced search strategies should produce risk-oriented searches for high-attraction/low-risk descriptions and attractiveness-oriented searches for high-risk/low-attraction ones. A confirmatory search strategy should produce attractiveness-oriented searches for high-attraction/low-risk descriptions and risk-oriented ones for high-risk/low-attraction descriptions. If there is a primacy effect in evaluating the mixed vignettes, we would also expect primacy effects in information search. Again, it is uncertain what should occur in the neutral case. If balanced searches predominate, the search should be for a mix of attractiveness and risk aspects while if neutral descriptions are interpreted as disguised high-attraction/low-risk descriptions, a balanced search should produce risk searches. If confirmatory searches predominate, and neutral descriptions are interpreted as a disguised high-attraction/low-risk, there should be an attractiveness search. We do not know what to expect if neutral descriptions are interpreted as a distinct type under a model of a confirmatory search: because these descriptions are uninformative, it is difficult to determine what preference would be confirmed in this case.
- (B) Gender: Given that sensation seeking is positively correlated with male gender, we expect that males will search for more risky information than females. This hypothesis is based on past research on sensation seeking and partner selection (Henderson et al., 2005). We are uncertain, however, about the functional form of this effect—males may search for more risky information in all vignette types (producing a main effect) or just in inconsistent or high-risk/low-attraction one producing an interaction effect.
- (C) Physical appearance. We have little experience relative to this question. Other research suggests (e.g., Dijkstra et al., 2000) that appearance may override risk information when making initial decisions about behavioral risks and related outcomes, but how physical appearance affects information search is unknown.

Methods and measures

Participants

Respondents were recruited to participate in the study on the campuses of two Philadelphia universities. The project was described to them and then necessary university IRB procedures in regard to informed consent were followed (i.e., respondents reviewed, signed, and returned a consent form that described the study and noted risks and benefits of participation). Each participant was compensated \$10 for their time while responding to the survey, which typically took 20–30 min to complete. We limited the analysis sample ($N=393$) to respondents between 18 and 28 years of age to be consistent with the earlier studies (Mean age = 20, Median age = 20, $SD=1.86$); 46% were male. The respondents

were predominantly Caucasian (48%) and African American (28%) with some Asian/Pacific Islanders (12%) and Hispanics/Latinos (4%). The remaining (8%) was of mixed or unknown ethnicity.

Survey administration

The survey was computer administered using the software *MediaLab* (Jarvis, 1998.) The first section asked for age, gender, and sexual orientation so that the potential romantic partner was the appropriate gender for the respondent.¹ The second part presented the respondent with nine different vignettes using the factorial method. Respondents assigned each description a score for attractiveness, risk to their sexual health, the likelihood of going on a date, having sex, and becoming infected with an STD or HIV after unprotected sex. Then, as we describe below, 20 new characteristics reflecting risk, attractiveness, or their combinations were displayed and the respondent could choose up to five of them as additional informational items. The survey continued with demographic (e.g., race, ethnicity) and other individual difference questions relating to the respondent's behavior.

What is a factorial survey?

A factorial survey is a self-administered survey that presents hypothetical scenarios (i.e., vignettes) that are randomly constructed from mutually exclusive descriptive phrases. Respondents then make an evaluative judgment or a decision based on the data in the complete scenario. Factorial surveys are often used to model individual decision-making processes and consumer preferences. An example of a decision making survey is Hennessy, Manteuffel, DiIorio and Adame (1997), which modeled adolescent decisions to have sex on the basis of randomly constructed social contexts. Consumer preferences have been studied in respect to programs to control STD infection (Hennessy, Williams, Mercier, & Malotte, 2002), HIV vaccine trials (Hennessy et al., 1996), and the desired features of STD/AIDS prevention programs (Hennessy, Mercier, Williams, & Arno, 2002). The construction and analysis of factorial surveys has been described in detail elsewhere (Hennessy, MacQueen, & Seals, 1995; Hox, Kreft, & Hermkens, 1991; Rossi and Nock, 1982).

Variable features of the vignettes

There were five types of vignettes constructed. The constituent characteristics of the descriptions were selected based on results in Fishbein et al. (2004). Extreme examples at both ends of the implicit risk/attractiveness rating scale were selected to make sure that the romantic partner descriptions were extremely contradictory when both high-risk/low-attractiveness and high-attractiveness/low-risk descriptions were presented to the respondent. Four types of vignettes were randomly constructed from the attributes listed in Table I:

- (HiA-LoR): random selection from high-attractiveness attributes 1 and 2 and from low-risk attributes 1 and 2, presented in that order;
- (HiR-LoA): random selection from high-risk attributes 1 and 2 and low-attractiveness attributes 1 and 2, presented in that order;
- (MixedA): random selection from high-attractiveness attribute 1, high-risk attribute 2, low-risk attribute 1, and low-attractiveness attribute 2, presented in that order; and

Table I. Attributes and levels used to construct the romantic partner vignettes.

| | |
|--|---|
| <i>Attractiveness attribute</i> | |
| 1. | Attractive |
| 2. | Average |
| <i>High risk attribute 1</i> | |
| 1. | Is a smoker |
| 2. | Uses drugs occasionally |
| <i>High risk attribute 2</i> | |
| 1. | Doesn't care about fitness |
| 2. | Believes that more sex, the better |
| <i>Low attractiveness attribute 1</i> | |
| 1. | Is often pessimistic |
| 2. | Is agnostic in religious orientation |
| <i>Low attractiveness attribute 2</i> | |
| 1. | Has tattoos |
| 2. | Is dependent on others |
| 3. | Is a high school graduate |
| <i>High attractiveness attribute 1</i> | |
| 1. | Believes that sex should be saved for someone special |
| 2. | Is flexible |
| <i>High attractiveness attribute 2</i> | |
| 1. | Is self-confident |
| 2. | Is trustworthy |
| <i>Low risk attribute 1</i> | |
| 1. | Is deliberate |
| 2. | Likes to share every thought |
| <i>Low risk attribute 2</i> | |
| 1. | Is idealistic |
| 2. | Takes initiative |
| 3. | Is a team player |

Note: Names for each potential romantic partner (10 for each gender) were also part of the random construction process, but the name of the potential partner played no role in the analysis or study. They were included to make the descriptions more realistic and less redundant. The names are not shown here.

- (MixedR): random selection from high-risk attribute 1, high-attractiveness attribute 2, low-attractiveness attribute 1, and low-risk attribute 2, presented in that order.

There were, however, symmetric restrictions placed on some of the selections to make the vignettes internally consistent: the high-risk aspect “more sexual experience the better” could not appear with the high-attractiveness aspect “believes that sex should be saved for someone really special” and the low-attractiveness aspect “is often pessimistic” could not appear with the contradictory highly attractive aspect “is self-confident.”

As noted above, one additional vignette type was constructed, the Neutral (NEU) description. This consisted of only two aspects: the age aspect of “between 18 and 25” and the marital status aspect of “single.” This type was added to the mix of HiA-LoR, HiR-LoA, MixedR, and MixedA to assess a “non-informative” condition because the NEU vignette contains virtually no useful discriminatory information about the potential partner because all potential romantic partners were described as “between 18 and 25” and “single”.

The physical appearance attribute also varied across types, but was not related to them. More specifically, after the five types of vignettes were constructed, one of the aspects of the physical appearance attribute (“attractive” or “average”) was randomly selected and this was always the last element of the constructed description.

In summary, HiA-LoR vignettes presented high-attractiveness and low-risk information while HiR-LoA types presented high-risk and low-attractiveness information. MixedA and MixedR combined aspects that represented both risky and unattractive and attractive and low-risk aspects in different order while the NEU type supplied only minimal information about the romantic partner. The randomly selected physical appearance aspect was displayed last. Each respondent evaluated nine vignettes in all, two of the HiA-LoR, HiR-LoA, MixedA, and MixedR type and one NEU.

The romantic partner descriptions

When the random selection, the constraints necessary for internal consistency, and gender specific pronouns were applied, a complete HiA-LoR description displayed for a heterosexual female, bisexual female, or homosexual male respondent might be:

Brian is single between the ages of 18 and 25. He is flexible and is trustworthy. He likes to share every thought and is a team player. Brian is average in appearance.

A HiR-LoA description for the same respondent might be:

Paul is single between the ages of 18 and 25. He is a smoker and doesn't care about fitness. He is often pessimistic and has tattoos. Paul is attractive in appearance.

A MixedR description for the same respondent might be:

Vance is single between the ages of 18 and 25. He is a smoker and is self-confident. He is often pessimistic and is a team player. Vance is average in appearance.

A MixedA description for the same respondent might be:

Tony is single between the ages of 18 and 25. He believes that sex should be saved for someone special and doesn't care about fitness. He likes to share every thought and is a high school graduate. Tony is attractive in appearance.

A NEU description for the same respondent might be:

Mark is single between the ages of 18 and 25. Mark is average in appearance.

The outcome measures

The respondents judged each potential partner vignette with respect to his/her potential sexual health risk, attractiveness, the likelihood of going on a date, the likelihood of having sex with the partner, and the likelihood that the respondent would become infected with an STD or AIDS from the partner after unprotected sex. The risk and attractiveness outcomes were scaled from 1 = extremely safe/extremely unattractive to 11 = extremely risky/extremely attractive and the likelihood items were scaled identically with "extremely unlikely" and "extremely likely" as the endpoints.

The last question about every vignette consisted of the stem "Given the information above, [i.e., the partner description] would you like to know if this potential partner:" where

the options included 20 potential partner characteristics. These additional information aspects represented one of five types of aspects based on a cross-tabulation of risk and attractiveness values attributed to them in an earlier study (Fishbein et al., 2004, Table IV). The five types and their informational aspects were:

- **High Risk/Low Attractiveness:** *feels unfulfilled, has his/her head in the clouds, thinks that cleanliness is over-rated, wants a casual relationship.*
- **High Risk/Neutral Attractiveness:** *likes to sexually experiment, is impulsive, is secretive/mysterious, believes that life is short and it should be lived to the fullest.*
- **Neutral Risk/Neutral Attractiveness:** *is a private person, is eccentric, has pierced body parts, is popular.*
- **High Attractiveness/Neutral Risk:** *is a social drinker, takes things as they come, is athletic, is a free spirit.*
- **High Attractiveness/Low Risk:** *wants to spend evenings together, is faithful to friends and acquaintances, is supportive of others, and is happy with his /her self.*

The 20 aspects were presented to the participant in three sets that were randomly ordered. The respondents could select from zero to five of the 20 aspects listed and could move forward and backward from screen to screen to reconsider their initial choices if necessary. The respondent's choices were used to create four additional variables in order to investigate the research questions related to information search. Two of the new variables were the number of additional informational aspects desired for each vignette and a dichotomous variable that assessed whether, for a given vignette, additional information was or was not desired. The other two new variables computed measured the type of information desired in the post-assessment search stage. Because we did not want to impose a bi-polar structure on the information search measure, one information search measure reflected a search for attractiveness information and the other a search for risk information. Specifically, high-risk or high-attractiveness aspects in the desired list were coded "1," neutral aspects in the desired list as "0," and low-risk or low-attractiveness aspects in the desired list as "−1." The sum of the attractive or risk codes for the aspects selected (if any) when averaged by the number of items selected (e.g., 1–5) gives an average value for attractiveness and risk information desired. For the risk and attraction information search variables, positive values reflect a search for the characteristic (i.e., risky or attractive) and negative values the opposite.

Statistical analysis

We use regression analysis to identify the higher-order interactions between vignette type, physical appearance, and gender (although gender is not a design feature of the study, the random process that constructs the vignettes and then assigns them to respondents produces insignificant correlations between gender, appearance factor, and vignette type). For the continuous outcomes (the five partner assessments, the number of additional informational aspects wanted, and the two search type measures) we use random effects generalized least-squares regression that adjusts the standard errors of the coefficients for the repeated measures design using the Huber–White estimator.² For the dichotomous outcome of wanting more information, we use probit regression with the Huber–White correction applied and convert the *Z*-score metric coefficients (Agresti, 1990, pp. 102–104) into changes in the probability of wanting more information (Greene, 1993, p. 639).

Results

Descriptive statistics of the assessments and information search outcomes

Table II shows the means and standard deviations of the five judgments. Because the outcomes were scaled from 1 to 11, the midpoint value is 6. Most of the average values are slightly above the midpoint but one is far below (having sex). Looking at the information search summary statistics it can be seen that the average number of the five possible informational aspects requested was 3.82 ($SD=1.782$) and respondents wanted more information for over 86% of all romantic partner descriptions. Over all potential romantic partner descriptions, the search was for attractive aspects ($M=.405$, $SD=.394$) while risk aspects were generally avoided ($M=-.027$, $SD=.441$).

What are the effects of vignette type, appearance, and gender on judgments of risk and attractiveness and the other partner assessment outcomes?

Table III shows the ANOVA results for the five partner assessments. The table was produced the following way. All main and interaction effects were computed as dummy variables or products of dummy variables. This resulted in 19 parameter estimates representing the “saturated” model of all possible predictors (e.g., four main effects of vignette type, one main effect of gender, one main effect of appearance, four vignette type \times appearance two-way interactions, four vignette type \times gender two-way interactions, one gender \times appearance two-way interaction and four vignette type \times gender \times appearance three-way interactions). Then all the interactions were excluded and the significance of the change in likelihood comparing the more complicated model (i.e., the saturated one) with the restricted model (i.e., the one with main effects only) was computed using a Wald test (Kennedy, 2003, pp. 66–68). If this chi-squared value was not significant, only the main effects were retained. If some main effects were then individually insignificant, they were deleted. However, if the initial test for the necessity of any interactions reported that they were necessary, we repeated the procedure evaluating the highest-order (e.g., three-way) interaction first until the regression included all relevant sets of main or interaction dummy variables.

Table II. Summary statistics of assessment and information search outcomes.

| | <i>n</i> | <i>M</i> | <i>SD</i> |
|-------------------------------------|----------|----------|-----------|
| <i>Vignette assessment outcomes</i> | | | |
| Attractiveness | 3533 | 6.064 | 2.815 |
| Go on a date | 3533 | 6.186 | 2.841 |
| Have sex | 3516 | 4.226 | 2.973 |
| Risk | 3517 | 6.151 | 2.561 |
| Get infection | 3471 | 6.366 | 2.444 |
| <i>Information search outcomes</i> | | | |
| No. of aspects wanted | 3537 | 3.824 | 1.782 |
| Percent wanting more | 3537 | .868 | .338 |
| Attractiveness search | 3071 | .405 | .394 |
| Risk search | 3071 | -.027 | .441 |

Note: The scale for all assessment outcome items is 1–11. Scale for no. of aspects wanted is 0–5. Percent wanting more is a dichotomy. Range of search outcomes are –1 to +1, computed only for respondents who desired additional information. The *n* here refers to the number of partner descriptions evaluated.

Table III. ANOVA results for partner assessment outcomes: significant main effects and interactions.

| | $\chi^2(df)$ | <i>p</i> |
|---|--------------|----------|
| <i>Attractiveness assessment (n = 3,533 vignettes, 393 respondents)</i> | | |
| Vignette | 533.48 (4) | < .0001 |
| Appearance | 14.54 (1) | < .0001 |
| Gender | 19.75 (1) | < .0001 |
| Appearance × gender | 7.44 (1) | .0064 |
| Gender × vignette | 37.05 (4) | < .0001 |
| Appearance × vignette | 9.59 (1) | .048 |
| <i>Go on a date assessment (n = 3,533 vignettes, 393 respondents)</i> | | |
| Vignette | 471.26 (4) | < .0001 |
| Appearance | 12.83 (1) | .0003 |
| Gender | 12.76 (1) | .0004 |
| Appearance × gender | 4.67 (1) | .0307 |
| Gender × vignette | 37.16 (4) | < .0001 |
| Appearance × vignette | 9.76 (1) | .0446 |
| <i>Have sex assessment (n = 3,516 vignettes, 392 respondents)</i> | | |
| Vignette | 533.49 (4) | < .0001 |
| Appearance | 48.40 (1) | < .0001 |
| Gender | 160.28 (1) | < .0001 |
| Gender × vignette | 18.02 (4) | .0009 |
| <i>Risk assessment (n = 3,517 vignettes, 393 respondents)</i> | | |
| Vignette | 749.25 (4) | < .0000 |
| Gender | 6.67 (1) | .0098 |
| <i>Get infected assessment (n = 3,471 vignettes, 390 respondents)</i> | | |
| Vignette | 510.24 (4) | < .0001 |

Note: All χ^2 tests are adjusted for the non-independence of observations. The saturated model included three main effects (vignette type, appearance factor, and gender) and all higher-order interactions (19 *df* in all). χ^2 tests reflect the significance of the included factors in the final model.

Considering the assessment measures, all three main effects and all three two-way interactions were significant for both the attractiveness and the going on a date outcomes (the appearance × vignette interaction just less than .05 in both cases). For the have sex assessment, all three main effects were significant as well as the gender × vignette interaction. For the risk assessment, there were only main effects of gender and vignette, and for the get infected assessment, only the vignette type had any discernable effect.

An analysis of the research questions related to equivalency of MixedR and MixedA, and the HiA-LoR and NEU descriptions for the judgments requires significance tests on regression coefficients and their differences. To do this, we return to the estimated model in Table IV and test specific hypotheses about differences between combinations of coefficients. Because all the terms in the equation are dichotomous, tests of differences of combinations are equivalent to tests of differences between predicted means. For the attractiveness and go on a date outcome, there are eight comparisons of means for each, four concerning the MixedR versus MixedA differences and four concerning the HiA-LoR versus NEU differences. Both outcomes show the same pattern: none of the comparisons are equivalent except for the MixedR versus MixedA comparison for females evaluating vignettes of average attractiveness (detailed results on these comparisons are available from the first author). For the risk assessment, the observed difference between the MixedR and MixedA is also discernable from chance ($\chi^2 = 97.64, p < .0001$) as is the HiA-LoR and NEU difference ($\chi^2 = 223.68, p < .0001$). For infection, the same is true ($\chi^2 = 51.68,$

$p < .0001$ for MixedA versus MixedR difference; $\chi^2 = 172.91$ $p < .0001$ for HiA-LoR versus NEU difference, all these χ^2 tests have $df = 1$). The major exception to this general finding is the result for the have sex assessment. Here the two MixedR versus MixedA differences are non-significant as is the HiA-LoR versus NEU comparison for males. Females do differentiate between the HiA-LoR and NEU case when evaluating partner descriptions regardless of the attractiveness level of the description. Thus, there is still substantial evidence of a primacy effect of information when the MixedA and MixedR vignette types are compared. MixedR means were typically lower for attractiveness and going on a date and higher for outcomes like risk and getting infected when compared with MixedA means. Thus, even in vignettes in which positive and negative information is presented in a more balanced fashion, information presented first has greater impact on evaluative judgments than later information. Finally, the NEU vignettes appear to be considered more like a MixedA type than a HiA-LoR type for the assessment outcomes.

While the ANOVAs tell the statistical story, a better way to display the results is through plots. Figure 1 shows the predicted means, by vignette type, for the five assessment outcomes. The attractiveness and going on a date outcome require separate plots for male and female respondents and for vignettes that describe average or physically attractive potential romantic partners. For both of these outcomes, a physically attractive description increases the average levels of the outcome relative to romantic partners who were described as “average in attractiveness.” The gender \times vignette type interaction shows that males evaluating HiR-LoA descriptions assess them as more attractive and “dateable” than females. With respect to having sex, attractive appearance increases the likelihood of having sex for both genders while males always give higher average assessments for this outcome than females, regardless of whether the romantic partner is described as average or attractive. For the risk outcome, males give lower risk assessments to type of partner descriptions relative to females, but both genders are sensitive to risk differences across types of vignettes (i.e., HiA-LoR have the lowest risk and HiR-LoA have the highest). For STD infection, only the vignette factor is necessary; there are no appearance or gender-related differences.

What are the effects of vignette type, appearance, and gender on information search outcomes?

Now we shift the focus to the data on the twenty individual informational aspects—the choices of the information search task. Table IV shows the proportion of vignettes for which each aspect was selected for the sample as a whole (column 2) and by vignette type (columns 3–7) as well as the Spearman correlations between the proportions. The order of the aspects in the table is determined by the proportion of the total cases where the respondent desired the indicated aspect. That is, for almost 50% of all vignettes, the respondents wanted to know more about whether the romantic partner described is “happy with him/herself” followed by whether the potential partners “is faithful” and “is supportive of others.” Note that the top four aspects are informative about both attractiveness and risk (see the discussion of the coding of this variable in the legend of Table IV). In contrast, the next most frequently selected groups (from “likes to sexually experiment” to “believes that life is short”) are informative about attractiveness or risk, but not both. Finally, consider the four least selected characteristics. Three of the four are in the classification of “non-informative” about either attractiveness or risk (the fourth—“has his/her head in the clouds”—is informative, it is high risk and low attractiveness). Thus it appears that the respondents are searching initially for high-attractiveness/low-risk information, followed by those that are considered an indicator of at least one attribute. But the emphasis is clearly on attractiveness

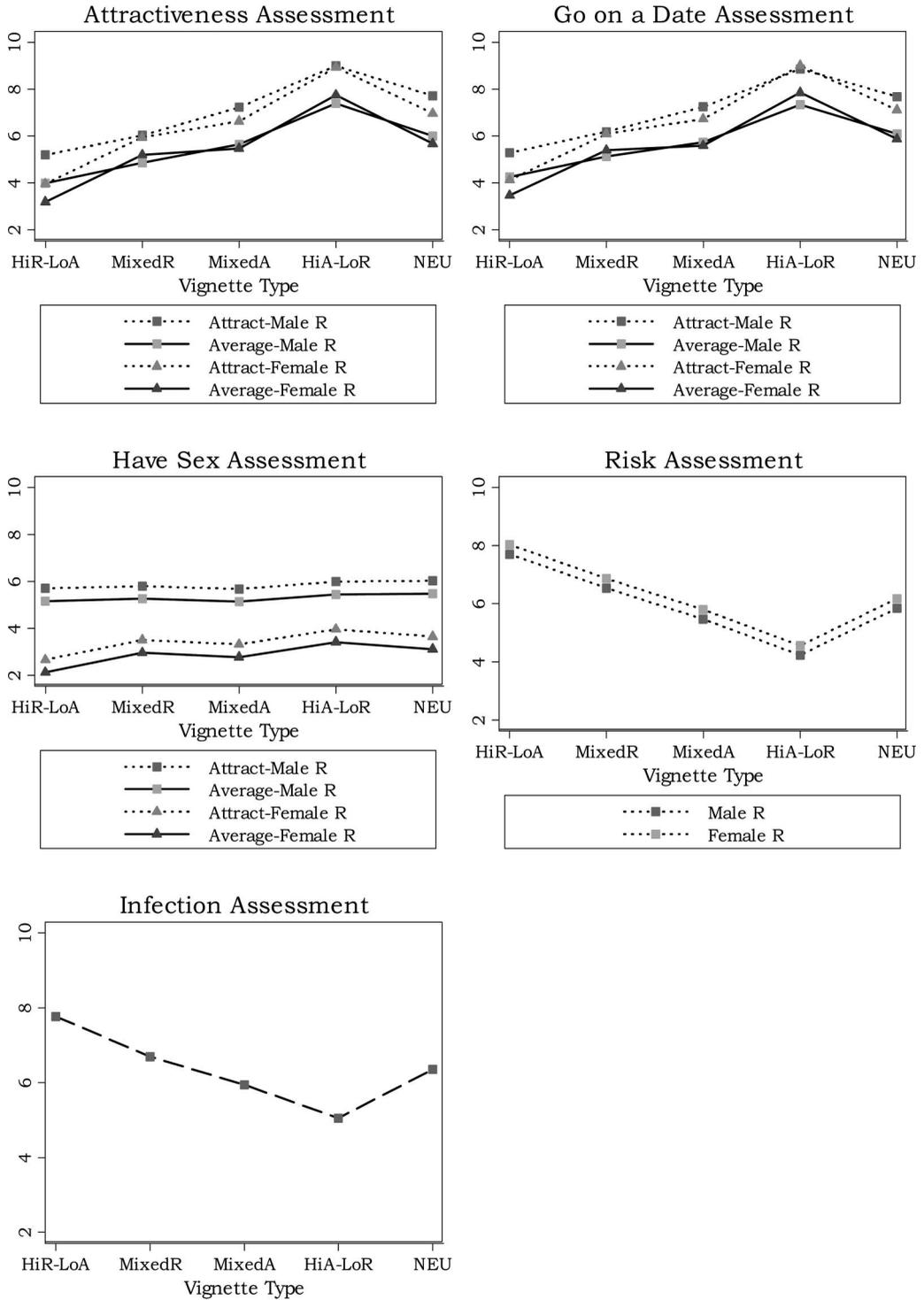


Figure 1. Analysis of variance (ANOVA) plots for romantic partner assessments.

Table IV. Informational aspects desired overall and by vignette type.

| Informational aspects (code) | Total (<i>n</i> = 3537) | Type of description | | | | |
|--|-----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|
| | | HiR-LoA (<i>n</i> = 786) | MixedR (<i>n</i> = 786) | NEUTRAL (<i>n</i> = 393) | MixedA (<i>n</i> = 786) | HiA-LoR (<i>n</i> = 786) |
| Is happy with his/her self (HiA-LoR)* | .487 | .444 | .424 | .552 | .527 | .521 |
| Is faithful (HiA-LoR)* | .426 | .377 | .416 | .557 | .403 | .445 |
| Is supportive of others (HiA-LoR)* | .324 | .270 | .300 | .368 | .333 | .372 |
| Wants a casual relationship (HiR-LoA)* | .292 | .278 | .301 | .333 | .262 | .306 |
| Likes to sexually experiment (R)* | .288 | .286 | .304 | .335 | .239 | .300 |
| Is a social drinker (A)* | .238 | .181 | .222 | .259 | .255 | .284 |
| Takes things as they come (A)* | .210 | .169 | .207 | .231 | .235 | .221 |
| Is a free spirit (A)* | .179 | .153 | .169 | .201 | .176 | .208 |
| Is athletic (A)* | .162 | .099 | .137 | .198 | .173 | .223 |
| Believes that life is short (R) | .159 | .157 | .178 | .139 | .150 | .160 |
| Wants to spend evenings together (HiA-LoR)* | .134 | .085 | .109 | .137 | .139 | .201 |
| Believes that cleanliness is over-rated (HiR-LoA)* | .120 | .155 | .108 | .127 | .125 | .089 |
| Is popular (UN)* | .111 | .080 | .101 | .137 | .115 | .134 |
| Feels unfulfilled (HiR-LoA)* | .110 | .147 | .128 | .061 | .113 | .076 |
| Is impulsive (R) | .108 | .108 | .111 | .091 | .114 | .109 |
| Is secretive/mysterious (R)* | .104 | .096 | .104 | .165 | .080 | .106 |
| Is a private person (UN)* | .102 | .067 | .096 | .134 | .113 | .117 |
| Has his/her head in the clouds (HiR-LoA) | .098 | .105 | .089 | .086 | .099 | .106 |
| Is eccentric (UN) | .095 | .095 | .094 | .111 | .090 | .094 |
| Has pierced body parts (UN)* | .065 | .081 | .072 | .043 | .067 | .052 |
| | | MixedR | NEU | MixedA | | |
| MixedR | | 0.910 | | | | |
| NEU | | 0.879 | | | | |
| MixedA | | 0.937 | | 0.902 | | |
| HiA-LoR | | 0.876 | | 0.945 | | 0.939 |

Note: Entries are the proportions of all romantic partner descriptions or type of description for which a particular informational aspect was selected. Rows are sorted by descending proportions of the total sample. The code for each aspect reflects the informational content of each aspect based on earlier research. HiA-LoR is high attractiveness and low risk; A is high attractiveness only; UN is uninformative re: attractiveness or risk; R is high risk only; LoA-HiR is low attractiveness and high risk. Asterisks in aspect column indicate significant differences between vignette type for that particular aspect; all *F* tests are corrected for non-independence. Lower part of table are Spearman correlations among proportions (*n* = 20).

and not risk: features that reflect high attractiveness/low risk or attractiveness only dominate the top part of the preference list, while those that are uninformative or reflect high risk/low attractiveness or high risk only dominate the bottom of the preference list. Under a balanced search strategy, high-risk/low-attractiveness features should be just as desirable to the respondent as high-attractiveness/low-risk features because they both provide information about attractiveness and risk. But there appears to be little evidence for a balanced strategy in this table.

For all but four characteristics, there were significant differences between vignette types in the desire to know about a particular feature. Another way of looking at vignette heterogeneity is through the correlation between the choices by vignette type. Although the Spearman rank order correlations (Table IV, bottom) between choice and description type are generally high, they are lowest between HiA-LoR and HiR-LoA types and highest between HiA-LoR and NEU, which suggests that NEU are being treated as HiA-LoR vignettes when information search is considered.

Table V shows the ANOVA results for the four information search outcomes. For both number of informational aspects desired and the probability of wanting more information, only the main effects of appearance and vignette type are necessary. For attractive searches, only vignette type makes a difference, but for risk searches, gender and vignette type are necessary.

The regression analysis applied to the information search outcomes also shows a pattern of significant differences between the MixedR and MixedA descriptions for the information wanted, percent wanting more information, and both kinds of information searches (for information wanted, $\chi^2 = 4.38, p = .0368$; for percent information wanted, $\chi^2 = 4.89, p = .0271$; for attractive searches, $\chi^2 = 9.59, p = .0020$; and for risk searches, $\chi^2 = 414.02, p = .0002$, all these tests have $df = 1$). However, only for the information wanted outcome are HiA-LoR vignettes differentiated from NEU ones ($\chi^2 = 5.73, p = .0166$). Thus for information search outcomes, the ordering of the information in the mixed descriptions remained important, but in three of the four cases, the NEU vignettes were treated as HiA-LoR types.

Again, plots of the significant effects are more informative than tests of ratios of sums of squares. These plots are found in Figure 2. Partner attractiveness increases the desire for

Table V. ANOVA results for information search outcomes: significant main effects and interactions.

| | $\chi^2(df)$ | p |
|--|--------------|--------|
| Number of additional aspects desired ($n = 3,537$ vignettes, 393 respondents) | | |
| Vignette | 102.85 (4) | <.0001 |
| Appearance | 9.78 (1) | .0018 |
| Percent wanting additional information ($n = 3,537$ vignettes, 393 respondents) | | |
| Vignette | 81.85 (4) | <.0001 |
| Appearance | 5.56 (1) | .0184 |
| Attractiveness searches ($n = 3,071$ vignettes, 390 respondents) | | |
| Vignette | 59.09 (4) | <.0001 |
| Risk searches ($n = 3,071$ vignettes, 390 respondents) | | |
| Vignette | 14.95 (4) | <.0001 |
| Gender | 8.19 (1) | .0042 |

Note: All χ^2 tests are adjusted for the non-independence of observations. The saturated model included three main effects (vignette type, appearance factor, and gender) and all higher-order interactions (19 df in all). χ^2 tests reflect the significance of the included factors in the final model.

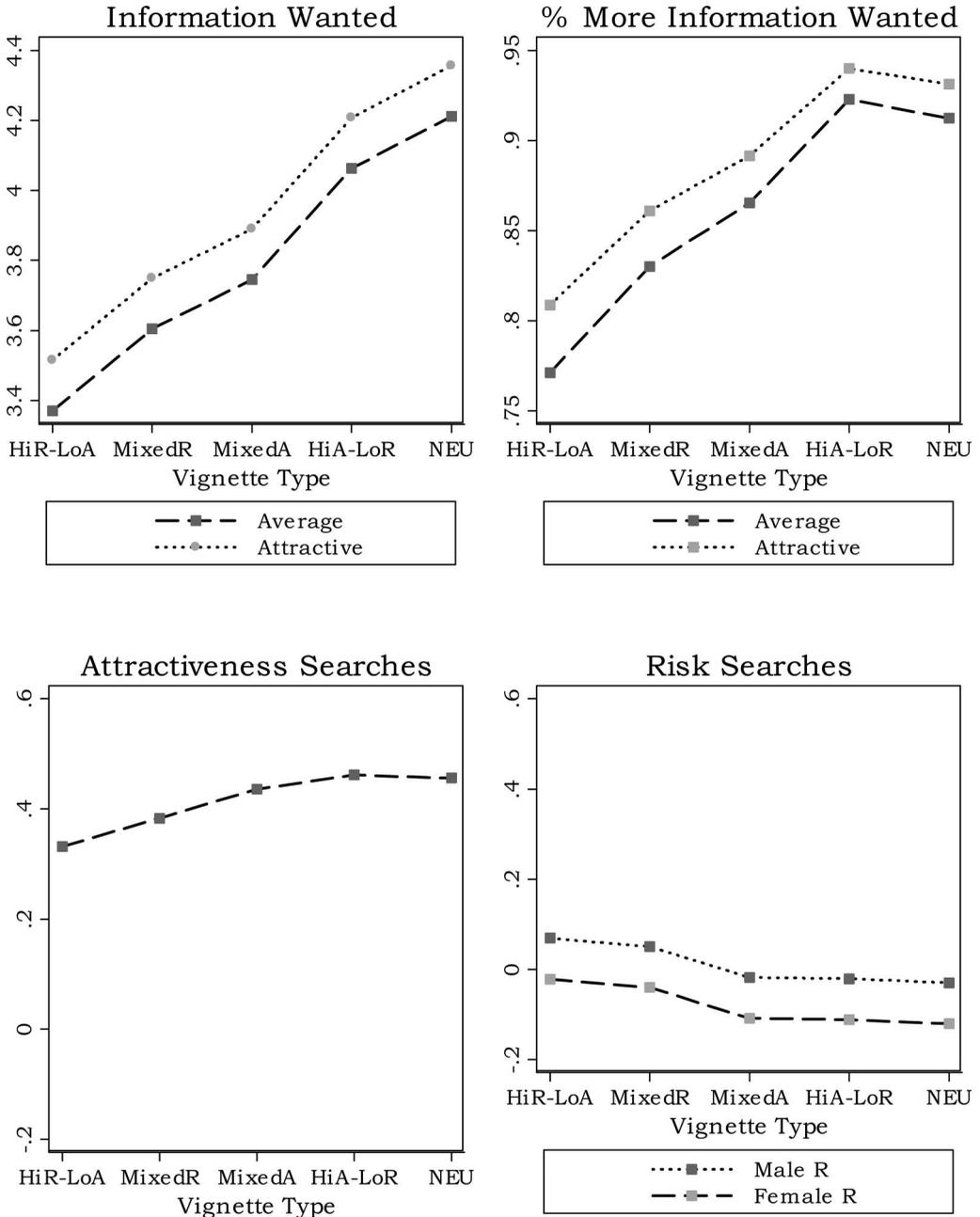


Figure 2. Analysis of variance (ANOVA) plots for information search outcomes.

more information for all types of descriptions, searches for attractiveness information are the norm for all types of descriptions, and males search for more risky features compared to females while both genders have higher risky search values for HiR-LoA and MixedR vignette types than for the other three. All these results are inconsistent with balanced information search strategies.

Discussion

Vignette type had strong effects on all assessments made about the hypothetical romantic partners. As expected, HiA-LoR vignettes showed highest average values for attractiveness, going on a date, and having sex, and HiR-LoA vignettes the highest average values for negative outcomes like risk and infection. The mixed types were intermediate with primacy effects present, except with respect to having sex. In general, the NEU type was interpreted as a mixed attractiveness (MixedA) vignette, not as a disguised HiA-LoR type.

In general, the results highlight the contextual nature of romantic partner preferences elicited. It is clear that the relationship between vignette type, gender, appearance, and potential partner assessments is not a simple one. For positive outcomes like attractiveness and dating, both the appearance factor and respondent gender were important in addition to the risk/attractiveness aspects that constituted the description. Consistent with previous research, males are more attracted to, and are more likely to want to date and to have sex with potential partners than are females. However, the impact of gender on attraction and dating was moderated by the type of vignette. Men and women differed with respect to HiR-LoA vignettes but not with respect to HiA-LoR vignettes. Perhaps the most striking finding was that physical appearance significantly influenced positive but not negative outcomes. Both men and women were more likely to be attracted to, want to date, and want to have sex with, potential partners who were attractive in appearance than those who were “average in appearance.” Gender did interact with appearance, but only with respect to the attractiveness assessment: men’s judgments of attraction are significantly more influenced by physical appearance than are women’s. When having sex is considered, men are more likely to have sex with all partner types and, for both genders; an attractive description elevated the probability of having sex. Very surprisingly, and in contrast to expectations based on past research, physical appearance did not influence judgments of risk or the likelihood that one could become infected if one had unprotected sex with the potential partner. To put this somewhat differently, although men are consistently less risk averse than are women, neither men nor women reduced their perceptions of risk when confronted with a physically attractive partner. In summary, these respondents seem to have a relatively sophisticated process of romantic partner selection. For attractive but not for risky judgments, appearance plays a role. Moreover, the type of description is always relevant to the respondents irrespective of whether the partner is described as attractive or average in appearance. Research hypotheses in the future need to be much more complicated and sensitive to contextual information.

When we look at information search, the results are less complex. Information search was related to vignette type: in 79% of the HiR-LoA vignettes the respondents desired more information compared with 93% of the HiA-LoR types. Another way to show the differences between vignette types is to correlate the risk and attractiveness ratings of each with the number of additional information aspects desired. The higher the risk ratings, the lower the number of additional aspects desired ($r = -.14, p < .05$) and the higher the attraction rating, the greater the number of additional aspects desired ($r = .24, p < .05$). The signs of these correlations are inconsistent with a balanced search hypothesis. In fact, the average additional information desired was attractiveness-related rather than risk-related for *all* types of vignettes although in HiA-LoR vignettes the tendency for attractiveness-related search was the highest and in the HiR-LoA type the search for attractiveness aspects was the lowest. All of these results are contrary to what would be expected under the balanced search hypothesis. Thus, there seems little evidence for a balanced strategy.

Gender plays no role in predicting information search outcomes. Thus, the hypothesis of gender differences in search patterns was not supported. However, appearance was important for information searching, but not for the type of information that was desired. In fact, the results show a general desire for more information and this tendency (both in terms of the average number of information aspects desired and the proportion of all vignettes for which more information is desired) was greater for vignettes describing an “attractive” potential partner as compared with one merely “average” in appearance. Finally, MixedR and MixedA descriptions were not treated similarly for any of the search outcomes, while NEU and HiA-LoR were in three of four cases.

In general, compared with romantic partner assessments, which is a complicated task, the information search strategy used by the respondents is relatively simple. Perhaps a better label for the information search process revealed here is one of “confirmation bias” (Nickerson, 1998) because searches for risk information are rare in all but HiR-LoA and MixedR cases, but even this result can be interpreted as a test of the “this is a potential high-risk partner” hypothesis and is just another facet of confirming a pre-conceived assessment. Under a balanced search rule, information search should be for *attractive* features in the HiR-LoA case and clearly it is not. Confirmation bias is also demonstrated by the results for the HiA-LoR and the NEU vignettes. In terms of searching for both attractive and risk information, respondents treated these types similarly and searched more for attractive aspects within these types than any other. The high correlation (.945) between the specific type of informational aspect desired for HiA-LoR and NEU vignettes is another way of demonstrating their essential similarity (Table II, bottom). The regression analyses of the search outcomes confirm that the average search type value is the same for NEU and HiA-LoR outcomes and the number of additional informational aspects desired is actually highest in NEU, followed by HiA-LoR. Final evidence for the operation of confirmation bias comes from the analysis of the informational aspects that were selected from the list of 20: they emphasized high attractiveness and not high risk. Note that the specific informational aspects that were desired tend to emphasize personality traits that probably would not be evident given a casual encounter (e.g., happy with his/herself, faithful, supportive of other, wants a casual relationship, see Table III).

Why is confirmatory searching the general strategy? Romantic partner selection is one decision context where the perils of false positives (e.g., selecting someone apparently supportive of others, but is also a promiscuous drug user) generally outweigh the lost opportunities represented by false negatives (e.g., rejecting a smoker who is also happy with his/herself, faithful, and wants to spend quiet evenings together). The first case is a worst mistake than the second, especially if it takes time to find out the reality of the situation. As Nickerson (1998, p. 204) summarizes this situation abstractly: “When, for example, the undesirable consequences of judging a true hypothesis to be false are greater than those of judging a false hypothesis to be true, a bias toward confirmation is dictated by some normative models of reasoning and by common sense.”

Regardless of the explanation for confirmation bias, partner search strategies based on confirmatory rules are likely to be the most risky in terms of health consequences because they actively avoid a systematic hunt for risk information or for mixed information that may nonetheless be risk informative. Insofar as confirmatory searches are usually biased against discovering negative or risky information, they could lead to unsafe sex with an apparently “safe” partner because relevant risky information was not revealed. However, there is evidence that training to identify and avoid biasing or incorrect decision-making heuristics can be successful (e.g., Erb, Bioy, & Hilton, 2002; Moutier & Houdé, 2003; Nickerson, 1998, p. 211), so it may be feasible to design interventions targeted at high school and

college-aged youth where the use of confirmatory strategies for information searches could be identified and participants could be trained to use a information search heuristic that emphasizes a balanced rather than confirmatory orientation.

This study has three weaknesses. First, the use of a convenience sample limits the potential generalizability of the results. In contrast, what would be ideal is a web-based version of the questionnaire and vignette program to which representative samples of respondents, both adolescents and adults, could be connected. Second, like all vignette type approaches, the hypothetical nature of the assessment and information search process probably does not correspond exactly to the assessment and information search processes used “in the field” by adolescents and adults. The next step in our series of studies is, in fact, a small study of risk and attractiveness assessments made by respondents of their actual romantic partners. Our interest is in attempting to replicate the “vignette types” through classifications of actual romantic partners and their perceived attributes to determine if risk and attractiveness assessments of actual partners are similar to those of hypothetical vignettes. Finally, a third weakness of this study is the number of still unresolved questions it raises. For example, the lack of gender differences in information search is an interesting finding and one that is inconsistent with what we know about gender differences in partner preferences and risk reaction. But should information search be expected to be different by gender, and if so, what is the rationale for this expectation? This is only one of many research questions that remain unanswered.

Acknowledgements

This research was supported by NIMH grant MH 62983. We thank Aram Aghazarian and Herbert Simons of the Department of Speech Communication, Temple University, for providing space and resources for data collection on their campus. We also thank Suzanne Martin and Nicole Trentacoste for comments of earlier drafts.

Notes

1. There were 162 males matched with opposite-sex partner descriptions, nine bisexual males matched with opposite-sex ones, and three males matched with same-sex ones. There were 202 females matched with opposite-sex partners, nine bisexual females matched with opposite-sex ones, and three females matched with same-sex ones.
2. The adjustment produces consistent estimates of the standard errors (i.e., bias decreases as the sample size gets larger) and as long as it is used in situations where the clustering variable has more than 20 values, it gives acceptable Type I error rates (Donner & Klar, 2000, p. 94; Murray, 1998, p. 99). Thus, this is not a concern here, for our clustering variable—the respondent ID—has 393 values.

References

- Agocha, V. B., & Cooper, M. L. (1999). Risk perceptions and safer-sex intentions: Does a partner's physical attractiveness undermine the use of risk-relevant information? *Personality and Social Psychology Bulletin*, 25, 746–759.
- Agresti, A. (1990). *Categorical data analysis*. New York: Wiley.
- Clark, L., Miller, K., Harrison, J., Kay, K., & Moore, J. (1996). The role of attraction in partner assessments and heterosexual risk for HIV. In S. Oskamp & S. Thompson (Eds.), *Understanding and preventing HIV risk behavior* (pp. 81–99). Thousand Oaks, CA: Sage.
- Donner, A., & Klar, N. (2000). *Design and analysis of cluster randomization trials in health research*. London: Arnold.

- Dijkstra, P., Buunk, B., & Blanton, H. (2000). The effect of target's physical attractiveness and dominance on STD-risk perceptions. *Journal of Applied Social Psychology, 30*, 1738–1755.
- Erb, H., Bioy, A., & Hilton, D. (2002). Choice preferences without inferences: Subconscious priming of risk attitudes. *Journal of Behavioral Decision Making, 15*, 251–262.
- Fishbein, M., Hennessy, M., Yzer, M., & Curtis, B. (2004). Romance and risk: Romantic attraction and health risks in the process of relationship formation. *Psychology, Health and Medicine, 9*, 273–285.
- Fishbein, M., & Jarvis, B. (2000). Peterman et al. failure to find a behavioral surrogate for STD incidence—What does it really mean? *Sexually Transmitted Diseases, 27*, 452–455.
- Gebhardt, W., Kuyper, L., & Greusven, G. (2003). Need for intimacy in relationships and motives for sex as determinants of adolescent condom use. *Journal of Adolescent Health, 33*, 154–164.
- Gold, R. S., Skinner, M. J., Grants, P. J., & Plummer, D. C. (1991). Situational factors and thought processes associated with unprotected intercourse in gay men. *Psychology and Health, 5*, 259–278.
- Greene, W. (1993). *Econometric analysis*. Englewood Cliffs, NJ: Prentice-Hall.
- Henderson, V., Hennessy, M., Barrett, D., Curtis, B., McCoy-Roth, M., Trentecoste, N., et al. (2005). When risky is attractive: Sensation seeking and romantic partner selection. *Personality and Individual Differences, 38*, 311–325.
- Hennessy, M., Fishbein, M., Curtis, B., & Barrett, D. (in press). Selecting romantic partners when confronted with contradictory cues. Forthcoming, *AIDS and Behavior*.
- Hennessy, M., MacQueen, K., McKirnan, D. J., Buchbinder, S., Judson, F., Douglas, J. M., et al. (1996). A factorial survey study to assess the acceptability of HIV vaccine trial designs. *Controlled Clinical Trials, 17*, 209–220.
- Hennessy, M., MacQueen, K., & Seals, B. (1995). Using factorial surveys for designing intervention programs. *Evaluation Review, 19*, 294–312.
- Hennessy, M., Manteuffel, B., DiIorio, C., & Adame, D. (1997). Identifying the social contexts of effective sex refusal. *Journal of American College Health, 46*, 27–34.
- Hennessy, M., Mercier, M., Williams, S., & Arno, J. (2002). Client preferences for STD/HIV prevention programs. *Evaluation and Program Planning, 25*, 117–124.
- Hennessy, M., Williams, P., Mercier, M., & Malotte, C. (2002). Designing partner notification programs to maximize client participation: A factorial survey approach. *Sexually Transmitted Diseases, 29*, 92–99.
- Hovland, A. (1958). The role of primacy and recency in persuasive communications. In E. McCoby, T. Newcomb, & E. Hartley (Eds.), *Readings in social psychology* (pp. 137–149). New York: Holt, Rinehart and Winston.
- Hoyle, R. H., Fejfar, M. C., & Miller, J. D. (2000). Personality and sexual risk taking: A quantitative review. *Journal of Personality, 68*, 1203–1231.
- Hox, J., Kreft, I., & Hermkens, P. (1991). The analysis of factorial surveys. *Sociological Methods and Research, 19*, 493–510.
- Jarvis, B. (1998). *MediaLab Research Software, Version 3.0*. New York: Empirisoft.
- Jonas, E., Schulz-Hardt, S., Frey, D., & Thelen, N. (2001). Confirmation bias in sequential information search after preliminary decisions: an expansion of dissonance theoretical research on selective exposure to information. *Journal of Personality and Social Psychology, 80*, 557–571.
- Keller, M. L. (1993). Why don't young adults protect themselves against sexual transmission of HIV? Possible answers to a complex question. *AIDS Education and Prevention, 5*, 220–233.
- Kennedy, P. (2003). *A guide to econometrics*. Cambridge: MIT Press.
- Maticka-Tyndale, E. (1991). Sexual scripts and AIDS prevention: Variations in adherence to safer-sex guidelines by heterosexual adolescents. *Journal of Sex Research, 28*, 45–66.
- Misovich, S., Fisher, J., & Fisher, W. (1997). Close relationships and elevated HIV risk behavior: Evidence and possible underlying psychological processes. *Review of General Psychology, 1*, 72–107.
- Montano, D., Kasprzyk, D., von Haefen, I., & Fishbein, M. (2001). Toward an understanding of condom use behaviors: A theoretical and methodological overview of Project SAFER. *Psychology, Health and Medicine, 6*, 139–150.
- Moutier, S., & Houdé, O. (2003). Judgment under uncertainty and conjunction fallacy training. *Thinking and Reasoning, 9*, 185–201.
- Murray, D. (1998). *Design and analysis of group-randomized trials*. New York: Oxford.
- Nickerson, R. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology, 2*, 175–220.
- Ohanian, R., & Cunningham, C. (1987). Application of primacy-recency in comparative advertising. *Current Issues and Research in Advertising, 10*, 99–121.
- Peterman, T. A., Lin, L. S., Newman, D. R., Kamb, M. L., Bolan, G., Zenilman, J., Douglas, J. M. Jr., Rogers, J., & Malotte, C. K.; Project Respect Study Group. (2000). Does measured behavior reflect STD risk? An analysis of data from a randomized controlled behavioral intervention study. *Sexually Transmitted Diseases, 27*, 446–451.

- Rhodes, F., & Malotte, C. K. (1996). Using stages of change to assess intervention readiness outcome in modifying drug-related and sexual HIV risk behaviors of IDUs and crack users. *Drugs and Society, 9*, 109–136.
- Rossi, P., & Nock, S. (1982). *Measuring social judgments: A factorial survey approach*. Beverly Hills, CA: Sage Publications.
- Tomkovich, C., & Dobie, K. (1995). Applying hedonic pricing models and factorial surveys at Parker Pen to enhance new product success. *Journal of Product Innovation Management, 12*, 334–345.
- Van der Velde, F. W., Van der Pligt, J., & Hooykaas, C. (1992). Risk perception and behavior: Pessimism, realism, and optimism about AIDS-related health behavior. *Psychology and Health, 6*, 23–38.
- Van der Velde, F. W., Van der Pligt, J., & Hooykaas, C. (1994). Perceiving AIDS-related risk: Accuracy as a function of differences in actual risk. *Health Psychology, 13*, 25–33.
- Williams, S. S., Kimble, D. L., Covell, N. H., Weiss, L. H., Newton, K. J., Fisher, J. D., et al. (1992). College students use implicit personality theory instead of safer sex. *Journal of Applied Social Psychology, 22*, 921–933.