RISK SEEKING AND RISK AVERSION IN THE SOCIAL DATING SITUATION

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Abstract

This study investigated the difference between males and females in their approach towards risk in the social dating situation, and the degree to which risk mediates the individual's assessment of potential dating partners. Other major factors considered were the physical attractiveness of the potential date, the probability of acceptance by the potential date, and secondarily, the subject's physical attractiveness, self-esteem, and willingness to incur risk in a non-interpersonal situation. The subjects, 30 males and 30 females, were asked to rate three photographs of potential date partners with the understanding that an actual date might result. Results indicate that all subjects were strongly influenced by the physical attractiveness of the potential dates and probability of acceptance in their overall rating and choice of potential dates.

With respect to risk, females demonstrated risk aversion in the dating paradigm, while males did not. These results were not affected when the self-esteem, physical attractiveness, and riskiness of the subject were statistically controlled.

Risk Seeking and Risk Aversion In the Social Dating Situation

Social-exchange theory (Homans, 1950, 1961; Thibaut & Kelley, 1959) appears to be an adequate and well accepted framework for conceptualizing attraction behaviors between individuals. Berscheid and Walster (1974), McKelvie and Matthews (1976), and Dermer and Thiel (1975) together describe an abundance of research studies which demonstrate that socially desirable traits and a lack of psychopathological traits can be considered rewarding qualities, and socially undesirable traits such as egocentrism can be considered punishing or cost properties. Social-exchange theory asserts that attraction towards another individual increases with rewards, and decreases with costs. This paper will accept this framework in describing the experimental project. First, a number of concepts that aid in the elaboration of this theory will be delineated.

Utility and Decision. Social exchange theory deals with interpersonal behaviors in terms of rewards and costs. One way of conceptualizing and quantifying these rewards and costs is in terms of utilities or subjective utilities. Utility can be defined as the quality or property of something as useful. Things possessing utility might be described as able to serve some practical use. For example,

street signs are of practical use to the public in general, as the automobile is to the individual. In a sense, money or the monetary value of something, can be thought of as at least a first approximation to a measure of utility. Money provides a standard which, barring fluctions in its value, is a relatively stable means of quantifying the utility of things. The use of this concept in discussing various issues has been well accepted at least since Bernoulli's 18th century essays (Bernoulli, 1738/1954) on decision making.

In each decisional alternative there are possible gains (rewards) and probabilities of gain, and there are possible losses (costs) and probabilities of loss. In most real life decisional situations there are often many potential outcomes. If one were to try to characterize these multiple outcomes with a single number, probably the best characterization would be the mean or expected value (EV) of the distribution of outcomes. The EV is defined as the average long-term outcome. The EV for situations where there are many possible outcomes can be calculated as follows. EV is equal to the sum of products between all possible outcome utilities (both positive and negative) and all corresponding outcome probabilities. Since there are many potential, outcomes there are many potential outcome utilities, positive and negative (Ui), and many potential

outcome probabilities, (Pi). If there are (n) possible outcomes utilities, and (n) corresponding probabilities, the EV of a situation/alternative is the sum of Ui times Pi, or mathematically, EV = Σ(UiPi).

Social exchange theory portrays the person as a more or less rational decision maker who attempts to assess his alternatives with respect to expected gains and losses[1]. However, research on decision during uncertainty (e.g., Kahneman & Tversky, 1984) suggests that several modifications on this prescriptive model are necessary to predict how people make such decisions.

It appears that people do not act directly in accordance with actual utilities expressed as money. Rather, they incorporate utility into their decision process in a subjective manner. Bernoulli (1738/1954) suggested that utility is a non-linear function of money. Individuals faced with decisional alternatives do not act on the rational outcome value (EV), but rather they act in accordance with their own subjective assessment of the outcome. Thus, in a decision-analytic framework, utility is better conceptualized as "subjective utility" (Edwards, 1954). In a lottery situation, for example, there is potential loss in the form of ticket cost should the participant lose, and potential gain in the form of prize money should he win. The rational model accommodates the

subjectivity associated with the utilities by labeling the gain and loss as "subjective weighted utilities" (SU). The subjective utilities associated with the cost of the ticket and the gain of the prize money are not equivalent to the respective monetary values.

Bernoulli proposed that people behave in a manner which will maximize expected utility (SU), rather than expected value (EV). He stated that utility forms a special type of function. This function more than a century later was formulated by Fechner for subjective magnitudes in general (Fechner, 1966). Specifically, Bernoulli stated that subjective value, or utility, forms a concave function with money. More recently, Kahneman and Tversky (1984) also found that the SU of individuals facing a decision is non-linear in money. They report that EV forms a concave function with respect to gains, and that EV forms a convex function with respect to loss. For example, in terms of either gain or loss, people tend to view the difference in utility between $100 and $200 as greater than that between $1200 and $1300. Again, each decisional alternative has certain SUs, and they do not appear to form a linear function with dollar value.

In addition to the SU of each alternative, the individual assigns "subjective probabilities" (SPr) to each of the outcomes. A clarification of terms is necessary

here. The phrase subjective probability has in past been used in two ways: as a name for a school of thought about the logical basis of mathematical probability (Good, 1950; DeFinetti, 1951), and as a name for a transformation of mathematical probabilities which is in some fashion related to behavior; the latter will be used here. Using the lottery situation again, the individual assesses his alternatives and arrives at his own subjective understanding of the probabilities of gain or loss. Thus, upon making any decision between alternatives the individual possesses subjective utilities (how good or bad the outcome might be) and subjective probabilities (how likely it is that a given outcome will occur). It is necessary to alter the model once again. Since utilities have been replaced with subjective utilities, and probabilities have been replaced with subjective probabilities, it follows that the overall expected value (EV) would be better considered as the subjective expected utility (SEU). The subjective utility of gain and subjective utility of loss will be identified as SUg, and SUl respectively; the subjective probability of gain and subjective probability of loss will be labled SPrg, and SPrl, respectively. Hence, expanded here to illustrate all components: SEU = (SUg x SPrg) - (SUl x SPrl).

Risk. Kahneman and Tversky (1984) report that individuals facing uncertainty demonstrate risk averse or

risk seeking behavior depending on whether the situation is within the domain of gains or the domain of loss, respectively. A preference for a sure outcome over a gamble that has an equal or higher EV demonstrates risk averse behavior. The rejection of a sure thing in favor of a gamble of equal or lower EV demonstrates risk seeking behavior. For example, suppose an individual has the choice between a gamble that offers an 85% chance to win $1000 (with a 15% chance to win nothing) and the alternative of receiving $800 for sure. The EV of this gamble is ($1000 x .85) - ($0 x .15) = $850. This EV exceeds the expectation of $800 associated with the sure thing, thus a preference for the sure gain is an instance of risk aversion. Kahneman and Tversky (1984) demonstrated that when faced with a sure gain people do in fact prefer the sure thing over the gamble, despite the gamble having a greater expected value. The following example illustrates risk seeking.

An individual is faced with choosing between a gamble with an 85% chance to lose $1000 (with a 15% chance to lose nothing), and a sure loss of $800. The EV of the gamble is -$850, whereas the expectation of the sure loss is -$800. An expression of preference for the gamble over the sure loss would be an example of risk seeking behavior. Several investigators have found support for risk seeking behavior

in the domain of loss (Fishburn & Kochenberger, 1979; Payne, Laughhunn, & Crum, 1980; Tversky & Kahneman, 1981).

As stated above, Kahneman and Tversky (1984) assert that the value function which people hold for decisional alternatives is non-linear in money, being concave in the domain of gains and convex in the domain of losses. This non-linear function allows for an explanation of risk averse and risk seeking behavior across the two domains. Figure 1 illustrates both risk seeking and risk aversion. The right side of the figure shows how in gains SEU becomes increasingly underweighted as potential gains increase and the individual becomes increasingly risk averse. Similarly, the left side of the figure shows that as the amount to be lost increases, the SEU of potential losses is overweighted

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Insert Figure 1 about here

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and the individual becomes increasingly risk seeking. It appears from Kahneman and Tversky's findings that SEU (operationalized as preference) is not equivalent to EV. Under conditions of uncertainty SEU and EV differ. It should be noted that at this point in the present discussion SEU is calculated with the assumption that the element of risk has no intrinsic value. Preference is dependent only

upon SEU defined as the sum of the products of subjective utility and subjective probability.

According to Kahneman and Tversky (1984), individuals facing decisions tend to be risk seeking or risk averse not only because of the non-linearity of utility in money as discussed above (Bernoulli, 1738,1954; Kahneman & Tversky, 1984), but additionally because of the non-linearity of subjective probabilities in the probabilities of decisional alternatives. For example, a lottery ticket tends to be thought of as having higher value when its probability of winning increases from 0% to 5% or 95% to 100% than when that increase is from 40% to 45%. "A change from impossibility to possibility or from possibility to certainty has a bigger impact (on subjective value) than a comparable change in the middle of the scale" (Kahneman and Tversky, 1984, p.344). Except for the end points of the distribution, Kahneman and Tversky found that the weights given to decisions were regressive with respect to stated probabilities (see Figure 2). Therefore, the majority of

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Insert Figure 2 about here

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actual decision weights (subjective probabilities) were lower than their corresponding (objective) probabilities. People tend to discount moderate and high probabilities (in

gains) relative to sure things, and this underweighting contributes to risk aversion. That is, when faced with a sure gain the individual tends to decrease the value of the gamble, even when that gamble maintains a higher EV than the sure thing, and prefers the sure gain. This discounting of moderate probabilities also leads people to be risk seeking (in losses) by decreasing the aversiveness of a negative gamble, i.e., when faced with a sure loss and the probability function is convex, the gamble is perceived as more attractive. As will be noted subsequently, this regressive tendency for subjective probabilities may be characteristic of lotteries and not generalized to all decisions under uncertainty.

Further, at the low probability end of the probability curve, it appears that subjective probabilities are enhanced, relative to objective probabilities. Kahneman and Tversky (1984) found that low and very low probabilities tend to be enhanced. Thus, in this region of probability the subjective expected utility of "long shots" is enhanced while the aversiveness of a small chance of severe loss is increased. People are risk seeking with improbable gains (buying lottery tickets) and risk averse with improbable losses (buying insurance policies).

Risk As Value. An alternative explication of risk aversion and risk seeking assumes that risk itself may have

intrinsic value, either as a gain or as a loss. Portfolio theory (Coombs & Huang, 1970) states that there is a preferred level of risk at each level of expected value, and that an individual will maximize expected value in a choice between wagers which deviate in risk the same amount from their respective ideal risk levels. The theory further states that preference is a function of expected value and perceived risk, and defines risk as the variability in the distribution of potential outcomes.

Utilizing this theory allows the concept of risk to replace Kahneman and Tversky's concepts of non-linearity in explaining the difference between SEU and EV. It is believed that depending on one's personal value orientation towards risk, SEU may be discounted or enhanced relative to level of risk. However, it has been found that these orientations may be substantially affected by environmental circumstance (Kahneman & Tversky, 1984). Kahneman and Tversky (1984) labled this a "framing effect". Thus, depending on the situation, which might be a game of chance or an interpersonal decision, risk itself may contribute a negative or a positive value to the overall SEU of an alternative.

The question of whether or not there are empirically testable differences between the Kahneman and Tversky approach (non-linearity of utility and probability) and

Portfolio theory (intrinsic value of risk) is controversial (Payne, 1973). In any case, the present project was not aimed at constructing such a test. Rather, it incorporated Portfolio theory as a working model because of its appealing conceptual and computational simplicity relative to the Kahneman and Tversky formulation.

Probability Distribution. Any gamble, wager, or lottery has an outcome probability distribution. For example, a lottery in which there is some probability, P, of a gain, G, and some probability, (1-P) of a loss, L, has a probability distribution that can be specified as: X = G with probability P, and L with probability (1-P). Throughout this discussion it will be assumed that $G \geq 0$, and $L \leq 0$. This distribution has a mean, or expected value, $E(X) = GP + L(1-P)$, and a variance of $VAR(X) = P(1-P)(G-L)^2$. This variability represents the level of uncertainty or risk of any gamble (Coombs & Bowen, 1971; Coombs & Huang, 1976).

As the formula indicates there are two components of the variability in this probability distribution. The first involves the combined probabilities of the outcomes. Decreasing the differences between outcome probabilities leads to increased variability. It can easily be shown that the quantity P(1-P), where $1 > P > 0$, has its maximum value at $P = (1-P) = .5$. Again, it is reasonable to interpret this component of variability in terms of uncertainty or

risk because a wager with two equally likely outcomes is intuitively more uncertain or riskier than one in which the probability of one outcome is closer to 1. Therefore, an alternative with 90% chance of gain and 10% chance of loss is less risky than an alternative with a 50% chance of gain and loss. It is also true, albeit less intuitively compelling, that an alternative with a 90% chance of loss and a 10% chance of gain is less risky than an alternative with a 50% chance of gain and loss.

The second component of the variance of the probability distribution involves the potential gains and losses. Variability (or risk) is increased by increasing either potential gain or potential loss. Since the potential gain (G) is conceptualized as a non-negative number, and the potential loss (L) is a non-positive number, variability increases as the square of the sum of the absolute value of each of these quantities. The idea that the riskiness of a wager increases with the amount at stake $(|G|+|L|)^2$ is intuitively compelling. For example, a decisional alternative with a potential gain of \$2 and loss of \$2, $(|G|+|L|)^2$ = \$16, is intuitively less risky than one with potential gain of \$20 and loss of \$20, $(|G|+|L|)^2$ = \$1600.

As has been discussed, Kahneman and Tversky (1984) have noted the preference for the "long shot" in wagering, and have attributed this preference to an overvaluing or

enhancement of very low subjective probabilities in otherwise risk averse situations. This phenomenon can be reconciled with Portfolio theory as follows. In a risk averse situation, SEU is discounted by the intrinsic value of risk, that is, by the variability of the probability distribution. However, situations in which P is small (long shots) will have low variabilities (therefore less risk), will result in high SEU's, and thus will be preferred to moderate values of P.

From the preceding discussion it is reasonable to assume that increased variability in the outcome distribution (or risk) should lead to an increase in preference for a given alternative, if the individual is weighting risk positively (demonstrating risk seeking behavior). Increasing the variability of the outcome distribution may also lead to a decrease in preference if the individual is weighting risk negatively (demonstrating risk averse behavior).

Portfolio theory implies another theoretical formula, different from that discussed above, which provides a different means of conceptualizing SEU, and a different means of explaining risk averse and risk seeking behavior. It is a less complex formula which does not make reference to the concepts of non-linearity in value and probabilities. In order to conceptualize SEU as a weighted average, EV and

the variance (risk component) will be weighted with T as the weight associated with expected gains and losses, and (1-T) as the weight associated with the value of risk. Hence, we have SEU = T(EV) +/- (1-T)(VAR), which expands to

$$SEU = T\,[GP+L(1-P)] + (1-T)\,[P(1-P)(|G|+|L|)^2]$$

in risk seeking, and

$$SEU = T\,[GP+L(1-P)] - (1-T)\,[P(1-P)(|G|+|L|)^2]$$

in risk aversion. According to Portfolio theory, then, the subjective expected utility of a given gamble is a weighted average of the expectations of gain and loss, and the variability (risk) of the gamble.

Utilizing this formula we can explain risk averse behavior as follows. An individual is faced with the decision situation in the domain of gains: he must choose between a sure gain of $800 (EV = $800), and an 85% chance of winning $1000 (EV = $850). If the individual is risk averse, in some manner he/she will alter the EV of the risky alternative so that the SEU of the sure thing is greater than that of the gamble.

Regarding the sure thing alternative, the Portfolio theory formula reduces to SEU = TGP because L = 0 and (1-P) = 0. Since there is no risk, the weight assigned to risk becomes 0, thus T = 1; and we know that if P = 1, then SEU = G = $800. Regarding the uncertain wager alternative (with L = 0 in the gain situation), the formula is SEU = TGP -

$(1-T)[P(1-P)G^2]$. Substituting the values P = .85 and G = $1000, gives SEU = 850T - 127500(1-T). Even if the weight assigned to risk (1-T) is very small (greater than .0015), then the sure thing would be preferred over the uncertain wager alternative.

To demonstrate how the Portfolio theory formula explains risk seeking behavior we observe the decision situation in the domain of loss. The individual must choose between a sure loss of $800 (EV = -$800), and an 85% chance of losing $1000 (EV = -$850). To be acting in a risk seeking manner, the individual must alter the EV of the risky alternative so that its SEU is greater than that of the sure thing.

Similar to the situation above, the SEU of the sure thing alternative has values G = 0, (1-P) = 0, the weight assigned to risk = 0, T = 1, and again the formula reduces to SEU = L = -$800. But, now the SEU of the gamble must be overweighted to become more preferred. With G = 0, we have $SEU = TL(1-P) + (1-T)[P(1-P)(L)^2]$. Substituting the values P = .85 and L = $1000, leaves SEU = 150T + 127500(1-T). Again, even if the wieght assigned to risk (1-T) is small (greater than .0015), then SEU > -$800, and the gamble would be preferred over the sure thing.

Figure 3 illustrates the preference curve which the Portfolio theory formula produces with value T equal to

Insert Figure 3 about here

.9985. A comparision of Figure 3 with Figure 1 demonstrates that Portfolio theory provides a reasonable account of the risk aversion phenomenon discussed by Kahneman and Tversky (1984).

In summary, Portfolio theory is an alternative model for explaining preference in certain situations. SEU has an additional factor of risk added to EV in risk seeking, and it has the risk factor subtracted from EV in risk aversion.

Non-monetary situations. Because most decisional situations involve potential loss and gain, and possess different levels of risk, Portfolio theory can be used to conceptualize the components of many non-monetary decision situations. An example of a non-monetary decisional situation might be where an individual is faced with the choice of whom to invite to a social event. The individual knows many different potential partners, some of whom may be more preferred than others (differential gain), and some of whom may accept or not accept the invitation (differential probability of gain). Assuming the individual does not wish to be rejected, he/she is faced with weighing each potential partner as an alternative with certain SU's, SPr's and potentially some element of risk.

In many respects the non-monetary decision situation resembles the gamble or wager situation that was first discussed. When an individual is faced with a choice between $800 for sure and an 85% chance at $1000, we have conceptualized this choice dilemma as a situation in which the person implicitly calculates the SEU for each, and ultimately selects that alternative with the higher SEU. This comparison of alternatives has been conceptualized in non-monetary situations by Thibaut and Kelley (1959) in terms of the comparison level for alternatives.

In the area of interpersonal interaction and attraction Thibaut and Kelley (1959) state that there is a minimum level which people hold called the comparison level for alternatives (CLalt), with which they weigh their interactions with others (alternatives) in terms of the rewards or costs incurred in that interaction. CLalt is defined as the outcome of the "best" available alternative. For example, how much a person, A, will be attracted to another person, B, depends upon whether the outcomes which A obtains from B are above or below A's CLalt. If the outcomes in a given relationship surpass CLalt, that relationship is regarded as satisfactory. If the outcomes attained are below CLalt, person A is dissatisfied and may terminate the relationship. The analogy to the wagering situation is that the choice of $800 for sure constitutes

the person's CLalt. So long as a risky choice has a SEU above this CLalt it will be chosen. If the SEU of the risky choice is below CLalt it will be rejected.

Despite this formal similarity, there is evidence which suggests how the non-monetary situation is dissimilar to the monetary one. It would be naive to assume that people approach all non-monetary situations as they do monetary ones. For example, in a monetary lottery situation the individual purchases one lottery ticket in hopes of his/her number being chosen at random. The individual might know the odds of his/her ticket number being chosen but he/she has no way to affect whether or not his/her ticket is actually chosen. Yet, in a non-monetary situation, such as an interpersonal relationship, the individual may see a multitude of ways of having some form of personal control over events and eventual outcomes, and thus his/her behavior in choosing alternatives may be substantially altered. A person's behavior seems heavily influenced by the sense of control.

Langer (1975) performed a series of studies on a phenomenon he termed the "illusion of control" involving playing cards, lottery tickets, a novel chance game, and confident or nervous (confederate) competitors. Langer demonstrated that in certain situations, people act as if objectively uncontrollable events are, in fact,

controllable. It appears that when certain elements typically associated with skill (e.g., practice, competition, choice) are brought into situations in which outcomes are objectively uncontrollable, expectancies of personal success are inappropriately higher than the objective probabilities would warrant. Given a situation in which personal influence over events is in any way plausible, people demonstrate an illusion of control.

Prior work by the current authors (Parra & Phillips, 1984) on the phenomenon of "unrealistic optimism" (Weinstein, 1980) illustrates another means of how people cognitively distort probability of personal success. In unrealistic optimism the individual estimates his own chance of success as greater, relative to his peers. In the Parra and Phillips (1984) study subjects were asked to state how likely, relative to their college peers, they felt they would experience a success, or avoid a failure. Subjects demonstrated a strong bias towards optimistic expectation in many non-monetary future life situations, e.g., personal health, academic, employment, and marital success. However, in the area of monetary chance situations (winning a lottery, success in the stock market) subjects did not respond with unrealistic expectation. It appears than in certain areas in the domain of non-monetary gains people overweight the probability of success in situations

involving risk. It may be that the regressive assessment of subjective probabilities occurs in lottery situations wherein the "illusion of control" is not very salient. However, in other situations, interpersonal relations, for example, this illusion may be more salient, and the reverse (overestimation of subjective probability) occurs. Thus, in an area such as interpersonal relationships the "unrealistic optimism" or "illusion of control" phenomena could potentially offset or even reverse the regressive assessment of subjective probabilities noted by Kahneman and Tversky (1984).

Attraction. It is clear that the concept of reward is important in interpersonal relations (Thibaut & Kelley, 1959), and reward value attributed to another person has been viewed in terms of interpersonal attraction (Newcomb, 1960; Byrne, 1971). At this point a review is presented of those factors which have been found to contribute to interpersonal attraction.

There is evidence that attitudinal similarity produces attraction or "liking" (Newcomb, 1961; Byrne, 1971), and that attraction causes the perception of similarity (Byrne & Wong, 1962). Similarity of personal attributes has been found to be related to attraction in a number of diverse ways: attraction to a stranger has been found to be greatly affected by the similarity of his economic status (Byrne,

Clore, & Worchel, 1977); people have been found to select as friends others who are closer to their own height (Berkowitz, 1969); and a consistent relationship has been found between attraction to a stranger and personality similarity as measured by the Repression-Sensitization Scale (Byrne, Griffitt, & Stephanic, 1967).

From a somewhat different point of view, Winch (1958) theorized interpersonal attraction not on attribute similarity but rather on attribute difference, i.e., attribute complementarity and complementary needs. His research focused on the role of personality "match" in mate selection and investigated to what extent "opposites attract". Some evidence exists that suggests that complementarity may be important only at certain times in an ongoing relationship. Kerckhoff and Davis (1962) performed a longitudinal study involving college couples as their relationship progressed toward marriage. It was found that in the early stages of the relationship consensus on attitudes and values were most critical in predicting whether or not the relationship would continue, and only later in the relationship did need complementarity become the most important determinant.

Triandis (1977) reported that certain behaviors exhibited by one individual towards others tend to increase the other's attraction to the individual. These behaviors

included the giving of love, status, information, money, goods, or services to another.

Environmental characteristics have also been found to influence interpersonal attraction. Griffitt and Veitch (1971) subjected college students to crowding, high humidity, and high temperature, and found more attraction in the normal than in the hot-temperature and more attraction in the low than in the high-populated conditions.

The direction of causality in the relationship between propinquity and attraction has been a matter of dispute: either attraction leads to propinquity, or propinquity leads to attraction. A number of studies have found a positive effect of mere exposure on attraction (Harrison, 1969; Zajonc & Rajecki, 1969; Zajonc, Swap, Harrison, & Roberts, 1971). Saegert, Swap, and Zajonc (1973) accounted for context in their design and found attraction varying as a direct function of exposure, in both positive and negative contexts. Yet some of the strongest evidence towards settling the dispute comes from a classic study by Festinger, Schachter, and Back (1950) who found that proximity and increasing the liklihood of interaction among similar individuals leads to higher rates of interaction and interpersonal attraction. Segal (1974), using subjects with similar backgrounds, found a .92 correlation between

proximity (physical position in a line) and individuals chosen as friends.

In the dating paradigm Walster, Aronson, Abrahams, and Rottmann (1966) found that independent of the individual's own level of attractiveness the most significant factor in determining a) the extent his dating partner was liked, b) the desire to date the partner again, and c) the frequency of actually asking the partner out, was the level of physical attractiveness of the partner. Neither personality measures, such as the MMPI, Minnesota Counseling Inventory, and Berger's Scale of self-Acceptance, nor intellectual measures, such as the Minnesota Scholastic Aptitude Test, and high school percentile rank, were able to predict couple compatibility. The date's physical attractiveness was the only significant determinant of the individual's liking for his date.

The importance of physical attractiveness as a determinant of attraction has been supported by many other investigators. Brislin and Lewis (1968) found a .89 correlation between the perceived physical attractiveness of a computer-dance-date and "desire to date the partner again"; while Tesser and Brodie (1971) found a .69 correlation between the same two variables. In both studies physical attractiveness correlated higher with "desire to

date again" than any other perceived characteristics including "similar interests" and "character".

In a number of laboratory and natural settings reciprocity has been identified as an important factor in attraction (Newcomb, 1961; Tagiuri, Blake, & Bruner, 1953). Blumberg (1969) found that subjects were happiest not only when their friends liked them, but also when their enemies disliked them. Blumberg's subjects reported desiring a decrease in asymmetry rather than an increase, even when this meant being less well liked rather than better liked. These findings are examples of the "strain toward symmetry" within dyads proposed by Newcomb (1953), and they are consistent with Heider's (1958) balance theory. One is expected to feel uneasy about unbalanced situations, and thereby to be motivated to strive for balance.

Miller and Geller (1972) found that in the perception of their own relationships, and those of others, subjects perceived relationships as stable only when both individuals in the dyad shared the same attitude toward the other (mutual liking, disliking, neutrality, or ambivalence). Further, it seems that what might be termed a "need" for reciprocity is implied in Newcomb's (1968) report that there is a strong tendency to exaggerate the degree to which one's own attraction toward another person is reciprocated at about the same level. As one individual shows liking and

acceptance toward another, that other person is increasingly inclined to reciprocate acceptance and liking. The importance of reciprocity suggests an important role for both acceptance and degree of acceptance.

Goffman in 1952 developed the "Matching Hypothesis" (Goffman, 1952) for social interaction. Each person maintains a sum of social attributes which are presumably determined by his/her level of social skills, intelligence, access to such material resources as money and prestige, physical attractiveness, and possession of the generally socially valued characteristics. It is believed that romantic aspiration is influenced by similar factors to those that influence level of aspiration in other areas (Walster et al., 1966). These factors are the desirability of the goal and perceived probability of attaining it. While socially desirable people ought to be preferred by everyone, the perceived probability of obtaining their attention and esteem ought to vary with the person's own social desirability. Thus, for romantic liaisons people should select, and like best, those of their own social desirability level.

Berscheid, Dion, Walster, and Walster (1971) found support for the matching principle in two experiments they conducted. In their study they had subjects "actively" choose a date partner, while the salience of possible

rejection by the chosen date was emphasized. The physical attractiveness of subjects and dates was independently rated by judges. While physically attractive dates were markedly preferred by all subjects, it was apparent that men and women of lesser attractiveness tended to choose less attractive dates than highly attractive subjects. It is likely that people tend to pair off in level of attractiveness from assessing their probability of acceptance. An individual who views him or herself as lower in attractiveness is likely to assess his/her probability of acceptance as low with all but those of similar or a lower level of attractiveness. Thus, interaction attempts are aimed primarily at others who are preceived as similar in attractiveness, wherein probability of acceptance is perceived as greater.

From the preceding literature review it is apparent that there are indeed many relevant factors involved in interpersonal attraction. Yet, as detailed earlier, there are but two major considerations in the rational model of decision making, subjective utility and subjective probability. Therefore, if we are to use this model in investigating interpersonal relationships we must also focus upon the two most appropriate or suitable factors. They are: a) physical attractiveness, because of its importance in interpersonal attraction and because it seems to best

capture the idea of subjective utility or gain; and b) probability of acceptance because it appears to best fit the concept of subjective probability.

Shanteau and Nagy (1979) in a study using only female subjects found that in the dating situation both probability of acceptance and physical attractiveness of the date were important in the subjects' overall preference for dates. They presented subjects with a stimulus card containing two photographs of dates and two probability of acceptance phrases. The subjects were to assume that the phrase represented the male's reaction to her photograph. Each subject was given a number of stimulus cards in each of three sessions. However, Shanteau and Nagy report "...the subject was aware that she would not actually go out on a date..." Results showed that females were influenced both by probability of acceptance and physical attractiveness in dating choice, i.e., the main effects were significant, and subjects tended to combine probability with attractiveness in a multiplicative fashion, as indicated by the significant interaction of these variables. The SEU of the potential date appears to have been estimated by simply multiplying SUg (attractiveness of date) with Prg (probability of acceptance). Thus, Shanteau and Nagy provide substantial evidence for the formulation that makes SEU the product of

gain (physical attractiveness) and probability of gain (probability of acceptance) in a situation involving

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Insert Figure 4 about here

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interpersonal attraction. Figure 4 illustrates mean preference responses from the Shanteau and Nagy (1979) subjects across four levels of attractiveness and seven levels of probability of acceptance.

Self-Esteem. Any attempt at assessing individual decision choice, particularly in the area of social interaction, would be improved with a consideration of individual self-esteem. This seems particularly relevant since interaction implies both action and reaction and it is believed that one's perceptions, correct or distorted, of others' reactions are an immediate determinant of self-concept. That an abundance of research on self-esteem exists (see Wylie, 1974, 1979) is understandable given the central role that how and what we think about ourselves plays in nearly all of what we do. It seems then quite plausible that self-esteem would influence our relations with others.

Leonard (1975) reported that high-self-esteem subjects are less attracted to a dissimilar stranger and more attracted to a similar stranger than are low-self-esteem

subjects. However, Sachs (1976) provided subjects with both attitudinal information about a stranger and evaluations of the subject by that stranger, and failed to find a significant relationship between self-esteem and attraction to the stranger. Thus, research in this area is contradictory.

Jones (1973) provides a thorough account of two basic theories of self-evaluation: self-consistency and self-esteem theory. To differentiate the two, he used the experimental situation wherein subjects are either high or low in self-evaluation and received either positive or negative evaluations from peers. He asked to what extent do these subjects accept or reject their peers.

Consistency theory (Jones, 1973) predicts that individuals with high self-evaluations will view positive evaluations as consistent, and view negative evaluations as inconsistent. Similarly, individuals with low self-evaluations will view positive evaluations as inconsistent, and negative evaluations as consistent. Thus, high self-evaluators should react more favorably to approval than to disapproval and low self-evaluators will react more favorably to disapproval than to approval.

Self-esteem theory (Jones, 1973) asserts that the individual strives towards enhancing his self-evaluation and to maintain, increase, or confirm his feelings of personal

worth and effectiveness. Thus, both high- and low-evaluators should respond more favorably to approval, and less favorably to disapproval.

The major difference between the two theories is that the first is designed to acheive self-consistency, and the second at enchancing self-esteem. In self-consistency theory individuals adjust their cognitions and orient their relations with others so as to maintain similarity between their own evaluations and those they receive from others. The self-esteem theory assumes that the individual has a need for self-esteem which is satisfied primarily by the approval he receives from others and is frustrated by their disapproval. To the extent that the esteem need is satisfied by other's evaluations, the individual will respond favorably to them (Jones, 1973).

Jones (1973) found that in spite of consistency theory being widely accepted, a stronger case can be made for self-esteem theory. This argument is supported by the following factors: a) empirical experiments provide more substantial support for the self-esteem predictions, b) direct observation finds the self-derogator increasing in positive affect when given positive evaluation, and c) basic extensions of self-esteem are capable of explaining consistency predictions. Jones concludes stating that all

people have a need to increase self-esteem and that this need is greater in low-self-esteem subjects.

Wylie (1979) reports in a major review of the self-esteem literature that significant positive correlations exist between scores representing self-regard and regard for "generalized others". She also finds "suggestive" evidence for the proposition that perceived acceptability to others is correlated with self-regard. However, she cautions the reader regarding the acceptability of the literature based on the "great methodological disparities" between the experimental designs.

It follows, then, that subjects who are given different levels of evaluation would be likely to respond in a positive manner to the positive evalution whether they are high- or low-self-evaluators, and those subjects lower in self-evaluation would respond more positively than those higher in self-evaluation. In general, this appears to point towards the importance of assessing self-esteem in research on interpersonal relations for the possibility of its having any of these effects.

Risk in Dating. It is hypothesized that risk may play a role in the non-monetary (dating) situation. Since a date is a type of gain it is further hypothesized that people would demonstrate risk averse behavior in this specific situation. It is hypothesized that the degree of risk

aversion will increase with the variability of the outcome, that is, as the subjective utility increases, risk aversion will increase, and as the subjective probabilities of gain increase (up from .5), risk aversion will increase. It should be pointed out that this effect diminishes the effect of the normative rule which states that as both EV and probability of gain increase, SEU increases. Because subjects will be demonstrating risk averse behavior, SEU will be lower than would normally be expected.

Earlier research by the present author (Phillips and Parra, in preparation) found that females tended to rate a familiar (or "mundane") type of date more positively than an unfamiliar (or "exotic") date. In the first part of this study male and female subjects were asked to read a paragraph description of one of two different types of opposite sex dates with whom they were going to go out on a hypothetical date. The mundane date was described using personality traits and biographical data of a peer that the subjects might likely encounter at their university. The exotic date was described using traits and biographical data of a person whom the subjects likely had not met, e.g., a transfer student from a large east coast city, with unstable academic performance, and liberal attitudes toward drugs, alcohol, and sex. Subjects were then asked to express their expectations toward enjoying the date. Based on the

discussion on uncertainty and risk it would be expected that the exotic date would be seen as more variable in outcome than mundane dates. This was in fact what was found. The rating scores of male and female subjects who were asked to rate each of the two types of dates demonstrated greater within subject variability on ratings of the unfamiliar date. It was also found that females (but not males) tended to evaluate the mundane date more favorably than males. This preference was clear despite the fact that the average rating of the separate characteristics in isolation did not differentiate between mundane and exotic dates for either males or females.

In a second study (Phillips and Parra, in preparation) both males and females were presented with a hypothetical date which was described using 13 different date characteristics, i.e., events that might occur on the date with their particular partner. Each of the 13 events differed on the extent which they were "good or bad events" (a pilot study determined the degree to which each of the events was preceived as good or bad), and they differed on how likely they were to happen on the date. The dates were divided into two groups on the variability of these events. Subjects were asked to carefully read the date characteristics, form an opinion of the potential partner, and evaluate him/her. The date partner which was presented

with the greater variability of date characteristics was rated lower by females. Females also felt they were less likely to experience a "successful date" with the date possessing greater variability. Thus, females demonstrated risk aversion in both studies, while males failed to demonstrate either risk seeking or risk aversion.

At this point an examination of hypothetical preference score curves will further emphasize the role of risk, and need to account for it, in the dating situation. Figure 5 represents hypothetical preference scores derived from the Portfolio theory formula. It similarly represents preference scores across increasing levels of attractiveness (8 levels) and different levels of probability of gain (10 levels). However, these curves have been attained with T equal to 1.00, which in turn leads to a zero value for the risk component. As can be seen Figure 5 reasonably

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Insert Figure 5 about here

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approximates the data generated by Shanteau and Nagy (1979) that was presented in Figure 4, lending weight to the notion that risk was not considered by subjects in the Shanteau and Nagy (1979) study. Their study represents a simple version of the Portfolio theory formula: the rational model, where T is equal to 1.00. That their findings can be accounted

for by the Portfolio theory formula provides additional evidence of the ability of the formula to conceptualize data in the area of interpersonal decision making in uncertainty.

The formula derived from Portfolio theory may also be used to demonstrate the discounting effect of risk in low probability of acceptance situations. Figure 6 illustrates hypothetical preference scores where T = .862. These hypothetical SEU's depict preference as if subjects were considering the element of risk. The preference curves each represent a different level of probability of acceptance. It can be seen that at higher levels of acceptance preference is relatively monotonic with attractiveness.

Insert Figure 6 about here

However, at increasingly lower levels of acceptance, preference becomes increasingly non-monotonic with attractiveness. At the lowest levels of acceptance preference increases from low to moderate attractiveness and then tends to decrease in the high attractiveness condition.

Support for this lack of monotonicity can be found in a study by Sigall and Aronson (1969). These researchers found that attractive females who evaluated male subjects positively were liked most, while attractive females who presented a negative evaluation towards subjects were liked

least. Falling between these two extremes, liking was greater for the unattractive-positive evaluator than for the unattractive-negative evaluator and, interestingly, the attractive-negative evaluator.

Intuitively, positive and negative evaluation can be viewed as cues to level of approval or acceptance. That is, if one individual rates another positively, that first individual is expressing some degree of acceptance of the second. To the extent that a person is rated positively or negatively by another, that person can be said to be accepted or not accepted by the other. Therefore, it may be that the highly attractive individual would be liked less than the unattractive individual when both are expressing a low level of acceptance. This is consistent with the non-monotonic effects of attractiveness on SEU at low levels of probability of acceptance as predicted by Portfolio theory and as illustrated in Figure 6.

Utilizing the formula from Portfolio theory we would expect that as probability of acceptance approached zero SEU would decrease, which is in fact what Shanteau and Nagy (1979) found. However, there is something further we might expect. Given that summing the probabilities of the date situation must result in a value of 1.00, if probability of acceptance is low, then probability of non-acceptance is high. Utilizing the Portfolio theory formula, at low levels

of acceptance as physical attractiveness (SUg) increases from moderate to high, SEU should decrease. This would also provide an alternative explanation of why Sigall and Aronson (1969) found that the high attractive-negative evaluators were more derogated than the moderate or unattractive-negative evaluators.

Yet, this phenomenon did not occur in Shanteau and Nagy's (1979) study. That no such effect was obtained by Shanteau and Nagy may have resulted from the lack of mundane realism in their study. That is, subjects did not expect to actually date the person rated. Clearly, their subjects knew they were not participating in an actual dating situation. Since there was nothing at stake there was nothing to gain or lose. Under these condition it is unlikely that the element of risk would have been a factor. The similarity between Figure 4 and the zero-risk curves shown in Figure supports 5 this possibility.

In Figure 6 the effect of risk can be noted in the concavity of the curves in all but the "sure thing"-high probability of acceptance date partner. Experimental subjects that produced preference data similar to that in Figure 6 could be labled risk averse in their approach towards potential partners. If there were a sex difference in this area with females tending toward risk averse behavior and males not demonstrating either risk seeking or

averse behavior, we would expect female data to more closely approximate Figure 6 and male data to approximate Figure 5.

The purpose of the present study is to examine in a more realistic situation than in pr evious studies 1) whether there is any difference between men and women in risk aversion or seeking behavior in the dating situation; 2) if increasing the value of a date (through increased realism and monetary gain), will lead to the lower rating of attractive dates in the low probability of acceptance condition as predicted by the Portfolio theory formula; and 3) whether such factors as the subject's physical attractiveness, individual differences in the propensity to take risks, and self-esteem play a role in mediating these effects.

Method

Subjects. 154 male and female undergraduates from introductory psychology classes at Oklahoma State University were administered a screening questionnaire and received extra-credit for their participation. This questionnaire was used to identify those students who would be eligible to participate in the full study. Eligibility requirements were that the subjects be unmarried and that they considered themselves "eligible to date others" (see Appendix A for the screening questionnaire). Of those that qualified, 30 males and 30 females agreed to participate. These subjects were

paid an amount from $3 to $13 for their participation. All subjects were run individually.

Materials. A set of three files each containing a photograph of a person of the opposite sex and a corresponding probability of acceptance phrase was used as stimulus materials. The stimulus photographs were obtained in a preliminary study. The stimulus persons were volunteer undergraduates who were fully informed of the use of their

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Insert Table 1 about here

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photos prior to their photo being taken and who had agreed in writing to the use of these photographs. The photographs were rated on level of attractiveness by additional volunteer undergraduates on a one to ten scale. Male subjects rated the female photos and female subjects rated the male photos. Eight photographs of each sex were selected from a larger set originally taken. An ANOVA and a

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Insert Table 2 about here

Newman-Keuls test were performed on the photo ratings to determine High, Moderate, and Low levels of attractiveness. Tables 1 and 2 contain the ANOVA summary tables and mean rating scores of all stimulus photos by male and female

subjects, respectively. Among the photos rated by females, all photos except the two with the lowest rating were significantly different from each other. Among those rated by males, three were found to be clearly significantly different from each other. The total set of six photos chosen for the present study were comparable in terms of attractiveness level across sex and were equally spaced within each sex.

Procedure. Initial recruitment was performed in the introductory psychology classes. All interested students were informed to show up for a screening session. At this session they received 1 point extra-credit and were asked to complete the screening questionnaire. Among many other questions the questionnaire elicited information on their eligibility, e.g., non-married, not steadily dating any one person, and/or free to date another person. The questionnaire also obtained names and phone numbers to later contact those who qualified to participate in the full study. The eligibles were contacted by telephone and informed that they had the opportunity of participating in a study in which they would be paid from $3 to $13. They were further informed that they had qualified by virtue of their marital and dating status and that it was their "attitudes about dating" on which the current study was centered. The

60 subjects who qualified and agreed to participate were instructed when and where to arrive for the study.

The entire study was conducted over one 5-day period (Thursday - Monday) to minimize leakage of information. Each subject was brought from a waiting room by a research assistant to the experimental room and was seated at a table. At certain points throughout the study, each subject was exposed to fictitious information so as to increase the realism of the situation. For example, subjects were told that a total of 6 subjects, including themselves, would be necessary to perform the study, and that it had been difficult to have all people show up on schedule, and at times people missed their session and needed to be rescheduled.

A description of the "typical" dating situation and the current study was given to each subject. This description included a statement that only those subjects who pick the potential date partner who also picks them will receive $13 to spend on the date (see appendix B for the description). The subject then signed a consent form giving his/her permission to be photographed. All subjects were informed that they would later have the opportunity to keep their photo if they so desired. The photo of the subject was taken in the same office location and with the same type of camera (Poloroid Sun 6000) as were the photos of the

potential dates; this additionally served to increase the realism of the study.

Following a brief period a second research assistant entered the room, was introduced by the first assistant, and stated that all other individuals were present and that the study could continue. The second assistant then took the subject to another room. In this room the subject was given the Rosenberg Self-Esteem Scale (Rosenberg, 1965) to complete and was told his/her photo was to be "taken to the next part of the study". The Self-Esteem Scale was titled "Background Information Form" and the subject was told its completion was needed to supply some additional information.

Approximately 10 minutes later the second assistant returned with three files. Each file contained a potential date's photograph (stimulus photo) and a form presumably completed by the pictured stimulus person. This form contained a) a hypothetical statement which was presumably provided for the potential date to read, and b) the probability of acceptance phrases. The following nine phrases were on the form: Definitely, Almost a sure thing, Very likely, Fairly likely, Toss up, Somewhat unlikely, Very unlikely, Little or no chance, and Definitely not. Each of the three files had one of these phrases, Fairly Likely, Somewhat Unlikely, and Little or No Chance, checked. Previously, (Lichtenstein & Newman, 1976) these three

phrases were found to be associated with the probabilities .66, .31, and .16, respectively. The hypothetical statement acknowledged the fact that a decision to date another person typically involves many other factors besides physical appearance. It also asked the potential date to decide on a date in this situation "based only on how this person (the subject) appears in this photo". The self-esteem material was collected and the subject was shown the files and photos and asked if any of the potential dates were known to him/her. No subject admitted to knowing any of the stimulus persons.

The subject was then instructed to carefully review all photos and probability of acceptance phrases and rank order the three potential dates. This ranking task was introduced as something which would aid the subject in his/her final decision. Next, the subject rated each of the potential dates on a single numerical rating scale (1 to 10) and on a series of Semantic Differential scales. The Semantic Differential elicited ratings across Good/Bad and Valuable/Worthless dimensions, and across Risky/Not Risky and Dangerous/Safe dimensions. Other scales utilitilized as fillers included: Weak/Strong, Slow/Fast, Active/Passive, Powerful/Powerless.

The subject was then asked to choose the individual with whom he/she would most-like, and second-most-like, the

opportunity to date. In several instances (6 females and 3 males), the subject did not wish to indicate a desired date. In those cases the subject was asked to choose hypothetically.

The subject was then taken to another room and debriefed. This debriefing informed the subject that although there would not in fact be any date, he/she would still receive from $3 to $13 as promised by way of a procedure detailed below. A note should be made with regard to information gathered verbally during the debriefing situation. It appeared that for very nearly all subjects the experimental procedure was perceived as extrememly realistic. A great majority of subjects either stated verbally or displayed through non-verbal behavior that they were suprised upon finding that there were not other potential dates actually present and that there was not going to be any opportunity for an actual date experience.

Following the debriefing the subject was taken to a final room containing a micro-computor. The instructions for the payment procedure were explained and subjects once again were asked to give written consent. Each subject was informed that this final part of the study involved a random number generator. The subject was asked to choose three of 10 numbers (0 to 9) printed on a form. These three numbers

were to be those which the subject believed would also be generated by the random-number computor program.

This task had two possible outcomes. These outcomes were receiving $13, or receiving $3, with a "somewhat unlikely chance" that the subject would receive the $13. The subjects was told that if the computor output at least 2 of their 3 numbers they would receive $13, and if the computor output less than 2 of their 3, they receive $3 for their participation.

The subject was then additionally informed that as an additional option the number-choosing opportunity could be sold back to the experimenter. The conditions were, however, that their could be only one "sales bid" and if the subject asked for an amount greater than a certain predetermined amount (the expected value, EV = $4.97, of the task) he/she could not sell and must then participate in the number-choosing task. An additional informed consent form was signed indicating an understanding of this additional opportunity. The subject then wrote down on the second consent form the amount, in dollars and cents, that he/she would be willing to accept in lieu of the chance to win either $3 or $13. The size of the subject's bid was used in the analysis as a measure of the subject's riskiness (see Appendix C for all consent forms).

Following the subject's bid the subject was informed if that price was acceptable. However, the critical amount, EV, remained known only by the experimentor. If the subject's bid was below the EV he/she received that amount in cash. If the amount was above the EV he/she needed to participate in the choosing of numbers. Following the sale or actual choosing of numbers, all subjects received their payment. The subject was given back his/her photo, then asked if they would return it for its use in similar future research studies. All but three subjects (one male and two females) returned their photo.

A follow-up study was performed utilizing those photos that subjects chose not to keep. These photos were rated by additional subjects in the same manner that the stimulus photos were rated. This allowed for the analysis of the subject's physical attractiveness as a co-variate along with self-esteem. It also provided a check within the study for the Goffman's (1952) "matching-hypothesis".

Design. The present design is a 3 x 3 x 2 factorial experiment. There are two within subject variables (Physical Attractiveness and Probability of Acceptance), each having three levels, and one between-subjects variable (Sex), having two levels. Because of the nature of the study it was impractical to expose each subject to all possible combinations of the within-subject variables.

Therefore, the analysis was performed by creating balanced incomplete replications, where each subject is designated as a block, assigning three treatment combinations to a block, and confounding the interaction between the two within-subject variables across the two replications.

With three levels of Physical Attractiveness, three levels of Probability of Acceptance, and two levels of Sex, there were 18 different treatment combinations. Each subject received three photos differing in attractiveness level, and three probability of acceptance phrases, each differing in level of acceptance. The photo/acceptance-phrase combination was different between all subjects in a single group, and within each group all possible combinations of the three levels of Physical Attraction and the three levels of Probability of Acceptance were administered. Five complete groups, 12 subjects in a group, were planned. Since each subject, male and female, was to receive three different treatment combinations, the total 60 subjects would have combined to produce 10 scores for each treatment combination. Unfortunately, two males and two females were accidently exposed to the incorrect experimental conditions. However, this resulted in only a difference between groups of 2 observations (two experimental groups had 9 observations and two experimental groups had 11 observations). Those groups composed of other

than 10 observations are noted accordingly within the tables of means.

A manipulation check was performed in order to verify the validity of the "risk" to which subjects were exposed.

Insert Table 3 about here

A variable was created, Risk, by averaging each subject's scores across Risky/Not Risky and Dangerous/Safe dimensions of the semantic differential task described earlier. The means for the Risk variable from male and female subjects are given in Table 3. Table 4 supplies the summary table for the analysis of variance with Risk as the dependent variable. As can be seen in Table 4, the main effects were found significant, Photo Attractiveness, $F(2, 104) =$

Insert Table 4 about here

14.12, $p<.01$, and Probability of Acceptance, $F(2, 104) = 9.83$, $p<.01$. Neither the effect for Sex nor any of the interaction components were found significant. Physical Attractiveness supports Portfolio theory predictions, whereas Probability of Acceptance does not. The relationship between mean scores for male and female subjects on the Risk variable is shown in Figure 7. For

both male and female subjects, lower levels of Probability of Acceptance resulted in the potential date being perceived

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Insert Figure 7 about here

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as more risky, and female subjects tended to view higher levels of Attractiveness as more risky (see Figure 7). A

Insert Table 5 about here

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simple main effects test was then performed on the Risk scores for all subjects. The ANOVA summary table for this test is given in Table 5.

As detailed earlier, the outcome probability distribution of a gamble (assuming $G \geq 0$, and $L \leq 0$) has a variance which can be computed by $VAR(X) = P(1-P)(G-L)^2$, and this variability represents the level of uncertainty or risk of the gamble. The first component of the variability involves the combined probabilities of the outcomes. Decreasing the differences between outcome probabilities leads to increased variability. The quantity $P(1-P)$, where $1 > P > 0$, has its maximum value at $P = (1-P) = .5$, (a wager with two equally likely outcomes is intuitively more uncertain or riskier than one in which the probability of one outcome is closer to 1). For example, an alternative

with 90% chance of gain and 10% chance of loss is less risky than an alternative with a 50% chance of gain and loss, and an alternative with a 90% chance of loss and a 10% chance of gain is less risky than an alternative with a 50% chance of gain and loss.

The second component of the variance of the probability distribution involves the potential gains and losses. Variability (or risk) is increased by increasing either potential gain or potential loss. Since the potential gain (G) is conceptualized as a non-negative number, and the potential loss (L) is a non-positive number, variability increases as the square of the sum of the absolute value of each of these quantities. With respect to a decision in the dating paradigm, with a given value of physical attractiveness (G), and a given value of probability of acceptance (P), we are able to compute the variance of each date alternative.

In the present study the probability values being associated with high, moderate, and low Probability of Acceptance are .66, .31. and .16 (Lichtenstein & Newman, 1976). If these were in fact the values that the subjects understood, and if the subjects conceptualized the word "Risk" as has been done in prior research (Coombs & Bowen, 1971; Coombs & Huang, 1976), the following would be expected: the greatest perceived risk at high Probability

of Acceptance (|.66-.5| = .16), a lower perceived risk at moderate Probability of Acceptance (|.31-.5| = .19), and the least perceived risk at low Probability of Acceptance (|.16-.5| = .34).

However, the Risk scores from male subjects are in the exact opposite direction than predicted by Portfolio theory in the low and medium Attractiveness condition. For males in the high attractiveness condition and for all females, risk scores are not differentiated where Portfolio theory predicts they should. Correlations were performed between subject's risk score and risk as predicted by the Portfolio theory formula. For males it was -.029, and for females it was .53. These correlation coefficients can be viewed as a measure of construct validity. Thus, it appears this is a better measure of risk for females than for males.

This presents a potential problem for interpretation of the "risk" presented to subjects as Portfolio theory warrants. It appears that subjects assess risk more in line with intuition than with the Portfolio theory prescription. However, there are two explanations that may provide allowance for the present method of presenting risk.

The first is straightforward. It may be that the subjects did not label risk in the same manner in which it is labled by Portfolio theory. Thus, there would exist Risk1 and Risk2, and they would not be equivalent.

The second is more complicated, yet it is supported by findings in another area. It is here suggested that the subjects have systematically distorted the Probability of Acceptance values upward due to the unrealistic optimism (Weinstein, 1980; Parra & Phillips, 1984) and/or illusion of control (Langer, 1975) phenomena. If subjects were doing this, by perhaps adding .3 to each of the Lichtenstein and Newman (1976) Probability values, these "distorted" subjective pobabilities would then be .96, .61, and .46 rather than .66, .31, and .16. This would have a significant effect on the Portfolio theory measure of risk. The differences between the new subjective probabilties and .5 would be exactly reversed from the Lichtenstein and Newman (1976) values.

The variability, or risk estimate, was calculated with the Portfolio theory formula using the new probability values. The correlation between the adjusted theoretical risk and subject's rated risk were .59 for males and .72 for females. While it is not known exactly to what degree subjects might be distorting the probability values, it is clear that any actual upward distortion in the subjective probability of acceptance would serve to lower the observed correlation between the original theoretical risk estimates and the subject's ratings of risk. Thus, the lower correlation between theoretical risk and rated risk may be

due to a difference in risk assessment, but also to an optimistic bias on the part of the subjects.

Results

Dependent Variables. The overall rating of the potential date partner performed by each subject on the 1 to 10 rating scale was labled "Rating". The scores from the Semantic Differential dimensions Good/Bad and Valuable/Worthless were averaged together to form one variable, "Evaluation". "Choice" scores indicate how the subject actually chose his/her potential date partner. A score of 1, 2, and 3 indicate first, second, and third choice. Results pertinent to each of these dependent variables are presented below.

Rating. The summary table for the analysis of variance with the Rating score as the dependent variable is shown in Table 6. As can be seen in Table 6, the main

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Insert Table 6 about here

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effects for both Photo Attractiveness, $F(2, 104) = 26.82$, $p<.01$, and Probability of Acceptance, $F(2, 104) = 15.99$, $p<.01$, were statistically significant. Also significant was the Sex by Photo Attractiveness interaction, $F(2, 104) = 4.17$, $p<.05$ (see Table 6). A simple main effects test was performed on Photo Attractiveness and found Sex significant

at high Photo Attractiveness, $F(1, 59) = 44.55$, $p<.01$, and insignificant at moderate and low Photo Attractiveness. The Photo Attractiveness by Probability of Acceptance interaction was not found significant. There was no significant effect for Sex.

The mean Rating scores from both male and female subjects are presented in Figure 8 and in Tables 7 and 8.

Insert Figure 8 about here

Rating scores from female subjects were monotonic with Photo Attractiveness in the high level of acceptance condition. However, in both the moderate and low Probability of

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Insert Table 7 about here

Acceptance conditions, Rating scores were non-monotonic with Attractiveness. Male subjects did not demonstrate this trend in their Rating scores, which were generally monotonic with Photo Attractiveness.

In order to evaluate this non-montonic effect a standard trend analysis was performed on the means for the Rating variable. For male subjects, there was no significant departure from linearity for any of the Probability of Acceptance conditions. On the other hand,

Insert Table 8 about here

the Rating means for female subjects in both the medium and low Probability of Acceptance conditions showed a significant non-linear trend, $F(1, 104) = 4.37$ $p<.05$, and $F(1, 104) = 6.91$, $p<.01$, respectively (see Figure 8). There was no significant departure from linearity in the high Probability of Acceptance condition for females.

Evaluation. The results for the dependent variable Evaluation were very similar to those for Rating. The summary table for the analysis of variance with Evaluation as the dependent variable is supplied in Table 9. As shown in Table 9, the main effects for Photo Attractiveness, $F(2, 104) = 21.81$, $p<.01$, and Probability of Acceptance,

Insert Table 9 about here

$F(2, 104) = 25.19$, $p<.01$, were statistically significant, as was the Sex by Probability of Acceptance interaction, $F(2, 104) = 5.79$, $p<.01$. A simple main effects test found Sex significant at high Probability of Acceptance, $F(1, 59) = 19.22$, $p<.01$. The Photo Attractiveness by Probability of Acceptance interaction was not significant, and there was no significant effect for Sex. The mean scores for Evaluation

from male and female subjects are found in Tables 7 and 8, respectively (see Tables 7 & 8).

The relationship between the mean Evaluation scores, Photo Attractiveness, and Probability of Acceptance can be seen in Figure 9. As with Rating, the male subject's

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Insert Figure 9 about here

Evaluation scores were generally monotonic with Photo Attractiveness, and female Evaluation scores were mononotic with Photo Attractiveness in the high Probability of Acceptance condition and were non-monotonic for the moderate and low Probability of Acceptance conditions.

A trend analysis was also performed on the means for Evaluation. The high Probability of Acceptance condition for male subjects was significantly non-linear, $\underline{F}(1, 104) = 4.43$, $\underline{p}<.05$. The Evaluation score curve for female subjects in the medium Probability of Acceptance condition was found marginally significantly non-linear, $\underline{F}(1, 104) = 3.38$ $\underline{p}<.10$.

These tests for non-linearity were less than optimally powerful as they did not allow credit for the fact that the specific monotonicity which was found for female subjects was predicted in advance. That is, the null hypothesis of non-linear trend using this analysis would have been rejected had the non-monotonic effect been in the opposite

direction. Since not only was non-monotonicity predicted, but also the specific direction of the non-monotonicity, the null hypothesis was contrasted with a directional alternative hypothesis using as critical values of F, values significant at 2(p). Using the directional hypothesis F values on the female Evaluation score curves, the medium Probability of Acceptance condition showed significant non-linearity, $F(1, 104) = 3.38$ $p<.05$, and the low Probability of Acceptance condition showed a marginally significant non-linear effect, $F(1, 104) = 2.39$, $p<.10$.

Choice. The summary table for the analysis of variance with Choice as the dependent variable is shown in Table 10. The between subjects variance components were not

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Insert Table 10 about here

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presented since the sum of the Choice variable score (1, 2, or 3, exclusively) was exactly 6 for each subject, and this eliminated the possibility of between subjects effects. Photo Attractiveness and Probability of Acceptance were both highly significant, $F(2, 104) = 35.43$, $p<.01$ and $F(2, 104) = 9.19$, $p<.01$. However, none of the interaction components were found significant (see Table 9). The analysis of variance for Choice failed to find a signficant effect for Sex.

The mean scores for Choice from male and female subjects are listed in Tables 7 and 8. The relationship between mean scores for male and female subjects on the

Insert Figure 10 about here

Choice variable are shown in Figure 10. Unlike the Rating and Evaluation data, Choice scores produced data curves which were linear in all conditions; the standard and directional trend analyses failed to find any significant non-linearity in these means (see Figure 10). In order to provide comparability between the present study and prior studies, correlations were computed between Photo Attractiveness and Choice and between Probability of Acceptance and Choice. These correlation coefficients ranged from .51 to .78. The complete correlation matrix is provided in Table 11.

Additional Correlational Data. Correlations performed between certain pairs of variables computed with the overall data are shown in Table 12. Table 13 contains

Insert Table 12 about here

correlation matrices for these same variables computed from both male and female data. Significant correlations

included: Dollar Bid given by each subject and Subject Number (how early each subject was run) -.28; Bid and

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Insert Table 13 about here

Self-Esteem, .37 females, -.07 males (not significant). Not significant were Self-Esteem and subject's own attractiveness, -.27 males, .14 females (see Tables 10, 11, & 12). Another variable, AC (Attractive Choice), was created by assigning a 3, 2, or 1, to each subject depending on whether he/she picked as preferred date the high, moderate, or low attractive potential date regardless of level of acceptance. The correlation between AC and Self-Esteem was 0.04 for males, and -.12 for females. The correlation between AC and Subject's own attractiveness was 0.25 for males, and -0.29 for females. The correlation between Choice of date and Photo Attractiveness was .58 overall, .63 for males, and .53 for females. The correlation between Choice of date and Probability of Acceptance was .31 overall, 38 for males, and .23 for females.

It was speculated that Subject Attractiveness, Self-Esteem, and Dollar Bid (risk estimate), might have influenced the subject's Rating, Evaluation, and Choice scores. A regression analysis was performed using the

Subject's Attractiveness, Self-Esteem, and Dollar Bid in the regression quantity for estimating Rating, Evaluation, and Choice. It was found from this regression analysis that the effect of each of these covariates did not appear to be consistent from cell to cell. That is, there appeared to be interactions between the covariates and the dependent variables. From Goffman's (1952) "Matching Hypothesis" we might expect such a finding. We might also expect that Rating and/or Evaluation of a potential partner might vary with the individual's own level of attractiveness, and self-esteem. Therefore, in an attempt to create a conservative analysis (allowing the effect of these potential influences to be as large as possible), a separate slopes model of ANCOVA was performed on the Rating, Evaluation, and Choice variables.

The analyses of covariance showed a marked reduction in the effects of both Photo Attractiveness and Probability of Acceptance on each of the dependent variables. However, the results of the trend analyses of the means after adjustment for all covariates were essentially the same as the results of the trend analyses on the unadjusted means that have already been reported. A more complete review of the analyses of covariance including tables and figures is presented in Appendix D.

Discussion

The major hypothesis of this study was that, in a social dating situation, females (but not males) would demonstrate risk aversion. This risk aversion effect was expected to manifest itself in a preference for a potential date that was non-monotonic as a function of physical attractiveness for low probability of acceptance, but which was a monotonic function of physical attractiveness for high probability of acceptance.

Figures 8 and 9, supported by the tests for trend, provide very substantial support for this hypothesis. The results were stronger for the Rating dependent variable than for the Evaluation dependent variable, but the effect is clear in both cases.

The data curves for the Rating and Evaluation variables among male subjects (see Figures 8 & 9) closely approximate the mean preference responses produced by subjects in the Shanteau and Nagy (1979) study (see Figure 4). It was described in the introduction that Shanteau and Nagy's subjects had performed as if they had not considered the concept of risk. The fact that the present male data resembles both the Shanteau and Nagy (1979) data and the hypothetical data calculated without the risk component shown in Figure 5 strongly suggests that the male subjects in the present study also acted without regard to risk.

Furthermore, the data curves for Rating and Evaluation from female subjects (see Figures 8 & 9) resemble those in Figure 6 (hypothetical preference scores calculated by the Portfolio theory formula with T = .862 illustrating preference as if subjects were considering the element of risk). The Evaluation scores from females show an effect for Probability of Acceptance only in the high Attractiveness condition (the non-monotonic trend predicted by the Portfolio theory formula). The significant trend for the male Evaluation score in the high Probability of Acceptance condition was not considered "non-monotonic" in the same sense as the significant trends for females. Upon inspection of Figure 9 it becomes apparent that these scores represent an increase and "leveling off", rather than an increase followed by a decrease as displayed by female subjects.

Upon inspection of mean Rating scores (see Figure 8), the significant Sex by Photo Attractiveness interaction seems to be a function of the risk aversion phenomenon demonstrated by females. Male subjects, apparently not responding to risk in their Rating scores, have higher scores, particularly in the high attractiveness condition. The simple main effects test on the Sex by Photo Attractiveness interaction indicate that males display significantly higher ratings than females in the high Photo

Attractiveness condition; whereas in the low and moderate conditions, there were no differences between males and females. Similarly, the simple main effects test on the Sex by Probability of Acceptance interaction for Evaluation indicates males gave higher evaluations than females in the high Probability of Acceptance condition, but there were no Sex differences in the moderate and low Probability of acceptance conditions.

Although the female Rating and Evaluation data indicate a risk factor is involved (risk aversion) they are not entirely consistent with the data found by Sigall and Aronson (1969) who found the low Probability of Acceptance, high Attractive date rated lower than the low Probability of Acceptance, low Attractive date. This particular data configuration had also been predicted by the Portfolio theory formula. Perhaps the realism of this study involving potential dates, rather than a "tester" as in Sigall & Aronson (1969), resulted in generally more moderate ratings. An individual who represents both a peer and a potential date might likely be less derogated than would an individual in a superior position who is administering a test.

The non-monotonic effect was not found among the scores for Choice for either sex. When faced with the task of actually choosing, i.e., performing the behavior which will directly affect whether or not a date will result, both

males and females ignore any perceived risk factor and act strictly in accordance with physical attractiveness and probability of acceptance. As with Rating and Evaluation, the subject's Choice scores are strongly affected by Probability of Acceptance and, to a much greater extent, Photo Attractiveness. There are no other factors which contribute significantly to the actual choice of the date partner.

Similar data has been found (Shanteau & Nagy, 1979), albeit in a much less realistic situation. Nevertheless, in this study Attractiveness is clearly the predominant factor in actual date choice. High attractive dates of all levels of acceptance were chosen more often as desired dates than even the high-accepting, low-attractive dates. Choice of partner determines if, and with whom, the individual will date. While Rating and Evaluation could be labeled assessment or opinion, Choice is the consequence relevant judgement.

One can only speculate as to why females in this study chose the date partner which they had rated so poorly. This is with reference primarily to the high attractive, low accepting date. It may be that when performing the task that is consequence relevant the influence of physical attractiveness outweighs the negative aspect of non-acceptance. The female subjects may have believed, by

virtue of unrealistic optimism or illusion of control that they could overcome, or change, the acceptance level of the male date and ultimately experience acceptance.

Although subjects were strongly influenced in their preference (Rating, Evaluation, and Choice) for potential dates by the physical attractiveness of the potential dates and the stated probability of acceptance, there were no significant Photo Attractiveness by Probability of Acceptance interactions. Figure 5 displays the set of scores predicted by the Portfolio theory formula where an interaction clearly is present. In the present study practical considerations (number of subjects required) limited the number of experimental conditions. Thus, the range of Probability was restricted to only that which was necessary to demonstrate the non-montonic trend. This restricted range of Probability did not allow for an interaction with Photo Attractiveness.

Self-Esteem, as it was measured in this study, did not effect the ratings given to potential dates regardless of the potential date's physical attractiveness. However, it may be that the Rosenberg Self-Esteem Scale is lacking in the sensitivity to detect a degree of Esteem, or lack of, for differentiation of different groups, and show an effect in the data. Or, perhaps since subjects were informed before agreeing to participate that the study was to be

focused on their "dating responses and attitudes", only those higher in Esteem volunteered and/or actually showed up to participate. Somewhat consistent with this finding, though inconsistent with the Matching Hypothesis (Goffman, 1952), is that the correlations between subject's attractiveness and the choice of an attractive date were insignificant for both males and females. Thus, the subjects in this study were not differentiated by degree of self-esteem in their rating or choice and chose their date partners according to probability of acceptance and, more significantly, physical attractiveness.

The -.28 correlation between Dollar Bid and Subject number reveals the possibility exists of a "leak" of information. That is, subjects tended to ask for a lower amount of money to sell their opportunity to choose numbers. It may have been that as subjects heard from friends having already participated that prior bids had been "too high" they adjusted their own bids accordingly. It was interesting to note the opposite pattern among certain correlations between the sexes. It appears males higher in physical attractiveness scored higher in self-esteem and chose date partners which were higher in physical attractiveness, while who were females higher in physical attractiveness scored lower in self-esteem and chose date partners who were lower in physical attractiveness.

All three "evaluatory" variables (Rating, Evaluation, and Choice) provide added evidence to the already existing large body of data for the importance of physical attractiveness in the dating situation (see Berschied & Walster, 1974 for a review). That Probability of Acceptance is proven here to be an important factor in the general desirability of a potential date partner is also consistent with prior research in this area (Walster, Aronson, Abrahams, & Rottmann, 1966; Tesser & Brodie, 1971; Shanteau & Nagy, 1979). As Huston (1973) found, subjects tend to give higher ratings and choose more often those potential dates who display a higher liklihood of acceptance.

Future research stemming from this study should focus more clearly on understanding the reasons, particularly with reference to females, for the difference between the "evaluation" of a potential date partner and actual "choice".

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Footnotes

[1]As Eagly and Chaiken (1984) have noted, the expectancy X value concept has been employed widely in psychological theorizing. It has figured in various theories of motivation (e.g., Atkinson, 1958; Lewin, 1938; Tolman, 1958) as well as in Rotter's (1954) social learning theory. It has been employed in a variety of conceptions of attitudes and attitude change (e.g., Peak, 1955) and forms the basis of recent work on attitudes by Fishbein and Ajzen (1975).

APPENDIXES

APPENDIX A

INITIAL SCREENING QUESTIONNAIRE

Please complete the following questionnaire. All information is confidential.

Sex_____ Age_____ Major in college_____

Year in college_____ Resident of Oklahoma_____

What year do you plan to graduate_____

Are you currently married?_____

If not, at what age do you plan to marry?_____

Would being in debt worry you?_____

Are you currently dating?_____

If not, have you recently separated from an ongoing relationship?_____

If recently separated, how long had you been dating this person?_____

Also, if recently separated, use the space below to indicate your current feelings regarding this separation (e.g., positive or negative feelings, attitudes towards other potential dates).

Upon marrying, how many children do you plan to have?_____

Would you say that your feelings are easily hurt?_____

Were your biological parents divorced?_____

About how old would you like to be when you marry?_____

How many children are there in your family?_____

Which position among your brothers and sisters are you (oldest, youngest, middle, etc.)?_____

Do you have "many" or "few" hobbies?_____

Whether you are currently dating someone or not, do you consider yourself eligible to date others?_____

Are you the type of person who likes to tell a good story or listen to a good story?_____

How many "close" friends would you say you have?_____

Compared with your peers at O.S.U., how likely are you to have a happy and secure marriage?

Please use the scale below:

1-----2-----3-----4-----5-----6-----7-----8-----9----10

Less likely Just as likely More likely

Do you (or did you) get along better with your mother or your father?_____ _____

Would you dodge paying taxes if you were sure you would never be found out?_____

Name _____

You may be contacted by phone for the next part of the study.

Please indicate those places and phone numbers which during the week and weekends you can be reached (for example home, work, dorm, etc.) and the times which you could be best reached (day of week and hours of the day) in the space below. Thank you for your participation.

APPENDIX B

DESCRIPTION OF TYPICAL DATING SITUATION

"Usually when two people are in a pre-dating situation, one person plays the role of the initiator, while the other plays the role of the responder. The initiator usually lets the responder know something about the initiator's availability for dating, that is, how much the initiator would like to date the responder or how likely the initiator would be to go out on a date with the responder.

Tonight, you will get to play the role of the responder. Three other people who are here tonight will be shown your photo and will be asked to communicate to you something about their availability to go out on a date with you. These initiators will tell you, in writing, how likely they would be to go out on a date with you. The next move will be yours. You will receive, in a little while, photos of 3 initiators who have seen your photo along with their ratings of how likely each of them would be to accept a date with you. You will then get to pick one of the three. Each of the initiators get to pick one of the three responders (you and two other people who are here tonight). If two of you pick each other, you will get to meet and discuss the possibility of having a date. If the two of you agree to go out, each of you will receive $13 to spend on that date. If for any reason, you don't get a date, you will be paid $3 for your participation".

APPENDIX C

STATEMENT OF CONSENT FORMS

I am participating in this study voluntarily, and for doing so I will receive extra-credit in my Psychology course and will be paid an amount, in cash, from $3 to $13.

I am giving my consent to be photographed as part of the experimental procedure. I am aware that my photo will be used only in this present study and will be returned to me before I leave today.

Please sign here

_____

Number-Choosing Opportunity

You now have the opportunity of choosing three numbers which you feel might also be chosen by a random number generator. If at least 2 of the numbers you pick are generated by the random number generating program in our computor you will receive $13. If less than 2 of your numbers are generated you will receive $3. You should be aware that your chance of receiving the $13 is "somewhat unlikely".

I understand the above opportunity and agree to participate.

(sign) _____

Please circle the three numbers you choose:

0-----1-----2-----3-----4-----5-----6-----7-----8-----9

Selling Opportunity

You are also given the opportunity of selling the Number-Choosing opportunity back to us for a certain amount in cash. This amount must be greater than $3 and less than $13. But, if the amount you choose to sell the number-choosing-opportunity is greater than a specific "critical amount" you will have to participate in the number-choosing.

I understand and agree to participate in this selling opportunity.

(sign) _____

I would like to sell the opportunity to choose numbers for: $_____.

APPENDIX D

COVARIATE ANALYSES

The summary table for the ANCOVA with Rating as the dependent variable is shown in Table D-1. Large effects were found for Photo Attractiveness, $F(2, 104) = 26.34$,

Insert Table D-1 about here

$p<.01$, and Probability of Acceptance, $F(2, 104) = 15.05$, $p<.01$ (see Table D-1). Also significant was an effect for Group, $F(16, 40) = 2.23$, $p<.05$, and a Sex by Photo Attractiveness interaction, $F(2, 104) = 4.27$, $p<.05$. The summary table for the ANCOVA with Evaluation as the dependent variable is given in Table D-2. On this variable

Insert Table D-2 about here

the ANCOVA found large effects for Photo Attractiveness, $F(2, 104) = 22.35$, $p<.01$, Probability of Acceptance, $F(2, 104) = 25.47$, $p<.01$, and the Sex by Probability

Insert Table D-3 about here

of Acceptance interaction, $F(2, 104) = 5.90$, $p<.01$ (see Table D-2). The summary table for the ANCOVA with Choice as the dependent variable is given in Table D-3. Here again large effects were found for Photo Attractiveness,

$F(2, 104) = 43.22$, $p<.01$, and for Probability of Acceptance, $F(2, 104) = 6.50$, $p<.01$ (see Table D-3).

Table D-4 contains the means of the Rating, Evaluation, and Choice residuals in each condition. The residual scores

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Insert Table D-4 about here

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for a given variable are the difference between the original value for that variable and the predicted value (see Table D-4). The means for the Rating residuals are displayed in Figure 11. It is evident from a visual comparison of Figures 7 and 11 that although the residual means are smaller quantities the trends from the Rating scores and the

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Insert Figure 11 about here

Rating residuals remain similar (see Figures 7 and 11). Moreover, a trend analysis using directional F values (direction of trend predicted) found an even greater effect

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Insert Figure 12 about here

(non-monotonicity) for females in the low Probability of Acceptance condition, $F(1, 104) = 8.07$, $p<.01$. The means for the Evaluation residuals appear in Figure 12.

Again, similar trend curves result from these means, and the effect for Evaluation in the low Probability of Acceptance

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Insert Figure 13 about here

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condition is slightly enhanced, $F(1, 104) = 2.72$, $p<.10$. Figure 13 illustrates the relationship between the means for the Choice residual. The curves from the Choice residual means failed to produce significant trends by either the standard or directional trend test.

Table 1

ANOVA Table and Mean Scores of Males Rating Female Photos

Source	SS	df	MS	F
Between Photos	195.93	7	27.99	25.55*
Between Ss	83.11	13	6.39	5.84*
Error	99.70	91	1.10	
Total	378.74	111		

Photo #	11[a]	16	8	20	13[a]	19	32	25[a]
Mean	[7.91	7.32	7.21]	[6.36	6.04]	[5.07	{4.54]	4.00}

Note. Bracketed means are those not significantly different ($p<.01$) by the Newman-Keuls test.

[a]Stimulus Photos.

*$p<.01$.

Table 2

ANOVA Table and Mean Scores of Females Rating Male Photos

Source	SS	df	MS	F
Between Photos	605.60	7	86.51	33.73*
Between Ss	212.72	20	10.59	4.13*
Error	359.09	140	2.56	
Total	1176.40	167		

Photo #	34[a]	19	15	22[a]	31[a]	28	13	27
Mean	8.45	7.05	6.76	6.10	4.10	3.62	[3.21	3.19]

Note. Bracketed means are those not significantly different ($p<.01$) by the Newman-Keuls test.

[a]Stimulus Photos.

*$p<.01$.

Table 3

Mean Risk Scores of Males and Females Across All Conditions

Group (n = 10)	Males	Females
A-B		
Low-Low	4.50	3.90
Low-Medium	4.27[a]	3.75
Low-High	2.83[b]	3.75
Medium-Low	4.20	3.10
Medium-Medium	3.65	3.56[b]
Medium-High	2.65	3.05[a]
High-Low	4.65	5.00
High-Medium	3.94[b]	5.00[a]
High-High	3.82[a]	4.11[b]

Note. A = Level of Stimulus Photo Attractiveness; B = Probability of Acceptance.

[a] n = 11. [b] n = 9.

Table 4

Summary Table for Analysis of Variance with Risk as Dependent Variable

Source	SS	df	MS	F
Between Subjects				
Replication(Rep)	2.69	1	2.69	0.84
Sex	0.20	1	0.20	0.06
Sex*Rep	4.05	1	4.05	1.26
Gr(Sex*Rep)	51.33	16	3.21	1.23
Subno(Sex*Gr*Rep)	104.28	40	2.61	
Within Subjects				
A	34.73	2	17.37	14.12**
B	24.19	2	12.10	9.83**
A*B	1.78	4	0.45	0.37
Sex*A	5.66	2	2.83	2.30
Sex*B	7.23	2	3.62	2.94
Sex*A*B	1.71	4	0.43	0.35
Residual	128.21	104	1.23	

Note. A = Photo Attractiveness; B = Probability of Acceptance; Gr = Group; Subno = Subject Number.

*$p<.05$. **$p<.01$.

Table 5

Summary Table for Analysis of Simple Main Effects of Risk Variable

Source	SS	df	MS	F
		Males		
B at A(Low)	4.025	2	2.013	1.636
B at A(Med)	12.350	2	6.175	5.020**
B at A(High)	16.385	2	8.193	6.661**
Residual		81	1.23	
		Females		
B at A(Low)	5.281	2	2.641	2.147
B at A(Med)	1.581	2	0.791	0.643
B at A(High)	0.150	2	0.075	0.061
Residual		81	1.23	

Note. A = Photo Attractiveness; B = Probability of Acceptance.

**$p<.01$.

Table 6

Summary Table for Analysis of Variance with Rating as Dependent Variable

Source	SS	df	MS	F
Between Subjects				
Replication(Rep)	14.17	1	14.17	1.81
Sex	23.11	1	23.11	2.95
Sex*Rep	1.33	1	1.33	0.17
Gr(Sex*Rep)	125.41	16	7.84	1.82
Subno(Sex*Gr*Rep)	172.72	40	4.32	
Within Subjects				
A	87.41	2	43.71	26.82**
B	52.12	2	26.06	15.99**
A*B	7.22	4	1.81	1.11
Sex*A	13.59	2	6.80	4.17*
Sex*B	2.61	2	1.31	0.80
Sex*A*B	3.31	4	0.83	0.51
Residual	169.74	104	1.63	

Note. A = Photo Attractiveness; B = Probability of Acceptance; Gr = Group; Subno = Subject Number.

*$p<.05$. **$p<.01$.

Table 7

Mean Scores of Males Across All Conditions

	Dependent Variable		
Group (n = 10)	Rating	Evaluation	Choice
A-B			
Low-Low	3.50	2.45	3.00
Low-Medium[a]	4.82	3.73	2.64
Low-High[b]	4.78	4.00	2.44
Medium-Low	4.10	3.50	2.40
Medium-Medium	5.00	3.80	1.80
Medium-High	6.60	5.35	1.40
High-Low	6.30	3.65	1.80
High-Medium[b]	6.22	4.61	1.33
High-High[a]	7.27	5.27	1.18

Note. A = Level of Stimulus Photo Attractiveness; B = Probability of Acceptance.

[a] n = 11. [b] n = 9.

Table 8

Mean Scores of Females Across All Conditions

Group (n = 10)	Dependent Variable		
	Rating	Evaluation	Choice
A-B			
Low-Low	3.30	3.05	2.90
Low-Medium	3.90	3.20	2.40
Low-High	4.65	3.45	2.50
Medium-Low	5.05	3.85	2.10
Medium-Medium[b]	5.44	4.17	2.00
Medium-High[a]	4.73	4.00	1.55
High-Low	4.20	3.60	1.70
High-Medium[a]	4.86	3.86	1.64
High-High[b]	6.33	4.89	1.22

Note. A = Level of Stimulus Photo Attractiveness; B = Probability of Acceptance.

[a] n = 11. [b] n = 9.

Table 9

Summary Table for Analysis of Variance with Evaluation as Dependent Variable

Source	SS	df	MS	F
Between Subjects				
Replication(Rep)	0.17	1	0.17	0.06
Sex	3.33	1	3.33	1.27
Sex*Rep	3.90	1	3.90	1.48
Gr(Sex*Rep)	42.11	16	2.63	1.59
Subno(Sex*Gr*Rep)	65.89	40	1.65	
Within Subjects				
A	33.60	2	16.80	21.81**
B	38.80	2	19.40	25.19**
A*B	4.80	4	1.20	1.56
Sex*A	0.47	2	0.24	0.31
Sex*B	8.91	2	4.46	5.79**
Sex*A*B	4.45	4	1.11	1.44
Residual	79.79	104	0.77	

Note. A = Photo Attractiveness; B = Probability of Acceptance; Gr = Group; Subno = Subject Number.

**$p < .01$.

Table 10

Summary Table for Analysis of Variance with Choice as Dependent Variable

Source	SS	df	MS	F
Within Subjects				
A	42.43	2	21.22	35.43**
B	11.01	2	5.51	9.19**
A*B	1.74	4	0.44	0.73
Sex*A	0.26	2	0.13	0.22
Sex*B	0.61	2	0.31	0.51
Sex*A*B	1.60	4	0.40	0.67
Residual	62.34	104	0.60	

Note. A = Photo Attractiveness; B = Probability of Acceptance.

**$p<.01$.

Table 11

Correlations Performed Across Subjects and By Sex

	Group		
Variables	Overall	Males	Females
Rating-Evaluation	0.76	0.73	0.78
Rating-Choice	0.56	0.62	0.51
Evaluation-Choice	0.59	0.63	0.55

Table 12

Correlation Matrix Performed Across All Subjects

	Bid	S#	SE	SA	AC
Bid	1.000				
S#	-0.283	1.000			
SE	-0.113	0.133	1.000		
SA	-0.072	-0.027	0.037	1.000	
AC	0.036	0.015	0.050	-0.106	1.000

Note. S# = Subject Number; SE = Self-Esteem; SA = Subject's Physical Attractiveness; AC = Attractive Choice;.

Table 13

Correlations Performed By Sex

	Males				
	Bid	S#	SE	SA	AC
Bid	1.000				
S#	-0.334	1.000			
SE	0.065	0.103	1.000		
SA	0.178	-0.151	0.272	1.000	
AC	0.291	0.031	-0.037	0.249	1.000

	Females				
	Bid	S#	SE	SA	AC
Bid	1.000				
S#	-0.191	1.000			
SE	-0.374	-0.056	1.000		
SA	-0.300	0.192	-0.135	1.000	
AC	-0.133	-0.050	0.121	-0.294	1.000

Note. S# = Subject Number; SE = Self-Esteem; SA = Subject's Physical Attractiveness; AC = Attractive Choice;.

Table D-1

Summary Table for Analysis of Covariance on Rating

Source	SS	df	MS	F
Between Subjects				
SA(Sex*A*B)	217.46	18	12.08	1.69
ES(Sex*A*B)	34.55	18	1.92	0.27
G(Sex*A*B)	62.35	18	3.46	0.48
Replication(Rep)	12.16	1	12.16	1.70
Sex	0.36	1	0.36	0.05
Sex*Rep	0.48	1	0.48	0.08
Gr(Sex*Rep)	114.20	16	7.14	2.13
Subno(Sex*Gr*Rep)	114.22	34	3.36	
Within Subjects				
A	0.59	2	0.30	0.18
B	9.08	2	4.54	2.69
A*B	1.95	4	0.49	0.30
Sex*A	1.60	2	0.80	0.47
Sex*B	2.17	2	1.09	0.65
Sex*A*B	6.78	4	1.70	1.01
Residual	94.82	56	1.69	

Note. A = Photo Attractiveness; B = Probability of Acceptance; Gr = Group; Subno = Subject Number.

Table D-2

Summary Table for Analysis of Covariance on Evaluation

Source	SS	df	MS	F
Between Subjects				
SA(Sex*A*B)	95.35	18	5.30	2.14
ES(Sex*A*B)	11.73	18	0.65	0.26
G(Sex*A*B)	19.91	18	1.11	0.45
Replication(Rep)	0.04	1	0.04	0.02
Sex	0.68	1	0.68	0.27
Sex*Rep	2.84	1	2.84	1.15
Gr(Sex*Rep)	39.64	16	2.48	1.44
Subno(Sex*Gr*Rep)	58.37	34	1.72	
Within Subjects				
A	0.10	2	0.05	0.06
B	10.02	2	5.05	6.47**
A*B	0.50	4	0.13	0.17
Sex*A	0.56	2	0.28	0.36
Sex*B	0.00	2	0.00	0.00
Sex*A*B	2.64	4	0.66	0.85
Residual	43.77	56	0.78	

Note. A = Photo Attractiveness; B = Probability of Acceptance; Gr = Group; Subno = Subject Number. **p<.01.

Table D-3

Summary Table for Analysis of Covariance on Choice

Source	SS	df	MS	F
Between Subjects				
SA(Sex*A*B)	49.96	18	2.78	39.71**
ES(Sex*A*B)	4.54	18	0.25	3.57
G(Sex*A*B)	9.21	18	0.51	7.29
Replication(Rep)	0.00	1	0.00	0.00
Sex	0.03	1	0.03	0.43
Sex*Rep	0.10	1	0.10	1.43
Gr(Sex*Rep)	1.07	16	0.07	0.26
Subno(Sex*Gr*Rep)	9.11	34	0.27	
Within Subjects				
A	1.49	2	0.75	1.17
B	3.94	2	1.97	3.08
A*B	0.87	4	0.22	0.34
Sex*A	0.94	2	0.47	0.73
Sex*B	1.02	2	0.51	0.80
Sex*A*B	1.91	4	0.48	0.75
Residual	35.82	56	0.64	

Note. A = Photo Attractiveness; B = Probability of Acceptance; Gr = Group; Subno = Subject Number. **$p<.01$.

Table D-4

Means of Dependent Variable Residuals

	Dependent Variable Residuals					
	Males			Females		
Condition	Rating	Eval	Choice	Rating	Eval	Choice
A-B						
Low-Low	-1.62	-1.49	1.00	-1.58	-0.80	0.90
Low-Med	-0.09	-0.13	0.64	-1.05	-0.67	0.40
Low-Hi	0.21	0.05	0.56	-0.35	-0.44	0.50
Med-Low	-0.76	-0.40	0.40	0.15	0.00	0.10
Med-Med	-0.05	-0.19	-0.20	0.38	0.24	0.00
Med-Hi	1.46	1.41	-0.60	-0.16	0.15	-0.27
Hi-Low	1.53	-0.34	-0.40	-0.86	-0.32	-0.50
Hi-Med	1.24	0.71	-0.67	0.02	0.20	-0.36
Hi-Hi	2.10	1.37	-0.82	1.38	1.01	-0.77

Note. A = Level of Stimulus Photo Attractiveness; B = Probability of Acceptance; Eval = Evaluation.

Figure Captions

Figure 1. Hypothetical value curve for risk seeking and risk aversion.

Figure 2. Subjective probability weighting curve.

Figure 3. Hypothetical preference curve derived from the Portfolio theory formula with T = 0.9985.

Figure 4. Mean preference response from Shanteau and Nagy (1979) subjects across 4 levels of Attractiveness and 7 levels of Probability of Acceptance.

Figure 5. Hypothetical preference curves derived from the Portfolio theory formula with T = 1.000 across 8 levels of Attractiveness and 10 Levels of Probability of Acceptance.

Figure 6. Hypothetical preference curves derived from the Portfolio theory formula with T = 0.862 across 8 levels of Attractiveness and 10 levels of Probability of Acceptance.

Figure 7. Mean scores of the Risk variable across 3 levels of Attractiveness and 3 levels of Probability of Acceptance.

Figure 8. Mean scores of the Rating variable across 3 levels of Attractiveness and 3 levels of Probability of Acceptance.

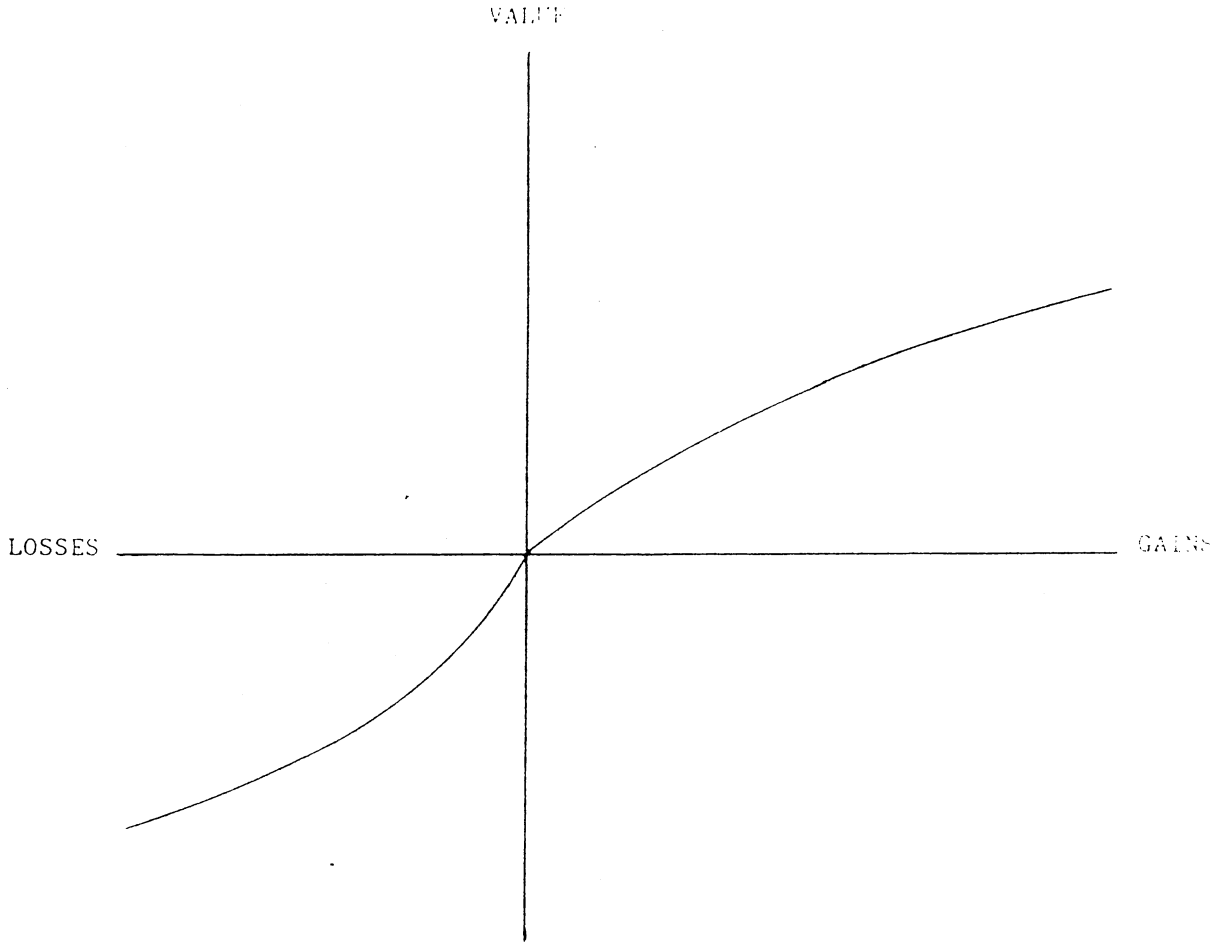
Figure 9. Mean scores of the Evaluation variable across 3 levels of Attractiveness and 3 levels of Probability of Acceptance.

Figure 10. Mean scores of the Choice variable across 3 levels of Attractiveness and 3 levels of Probability of Acceptance.

Figure 11. Mean scores of the Rating residual across 3 levels of Attractiveness and 3 levels of Probability of Acceptance.

Figure 12. Mean scores of the Evaluation residual across 3 levels of Attractiveness and 3 levels of Probability of Acceptance.

Figure 13. Mean scores of the Choice residual across 3 levels of Attractiveness and 3 levels of Probability of Acceptance.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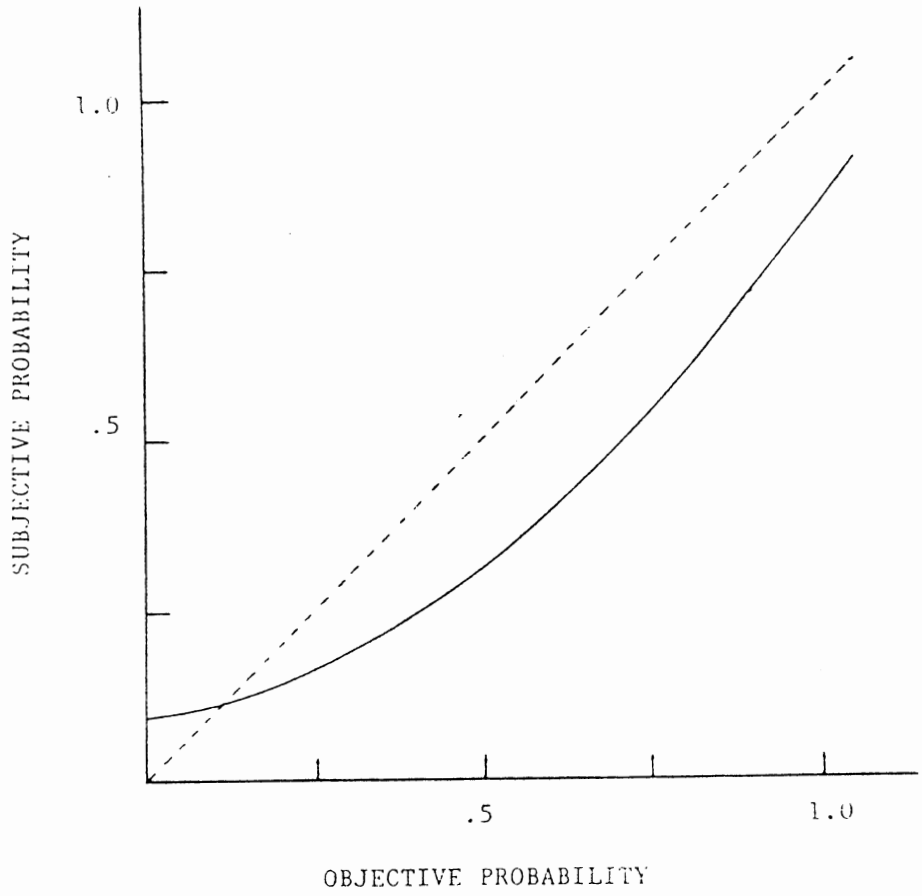
LOSSES
GAINS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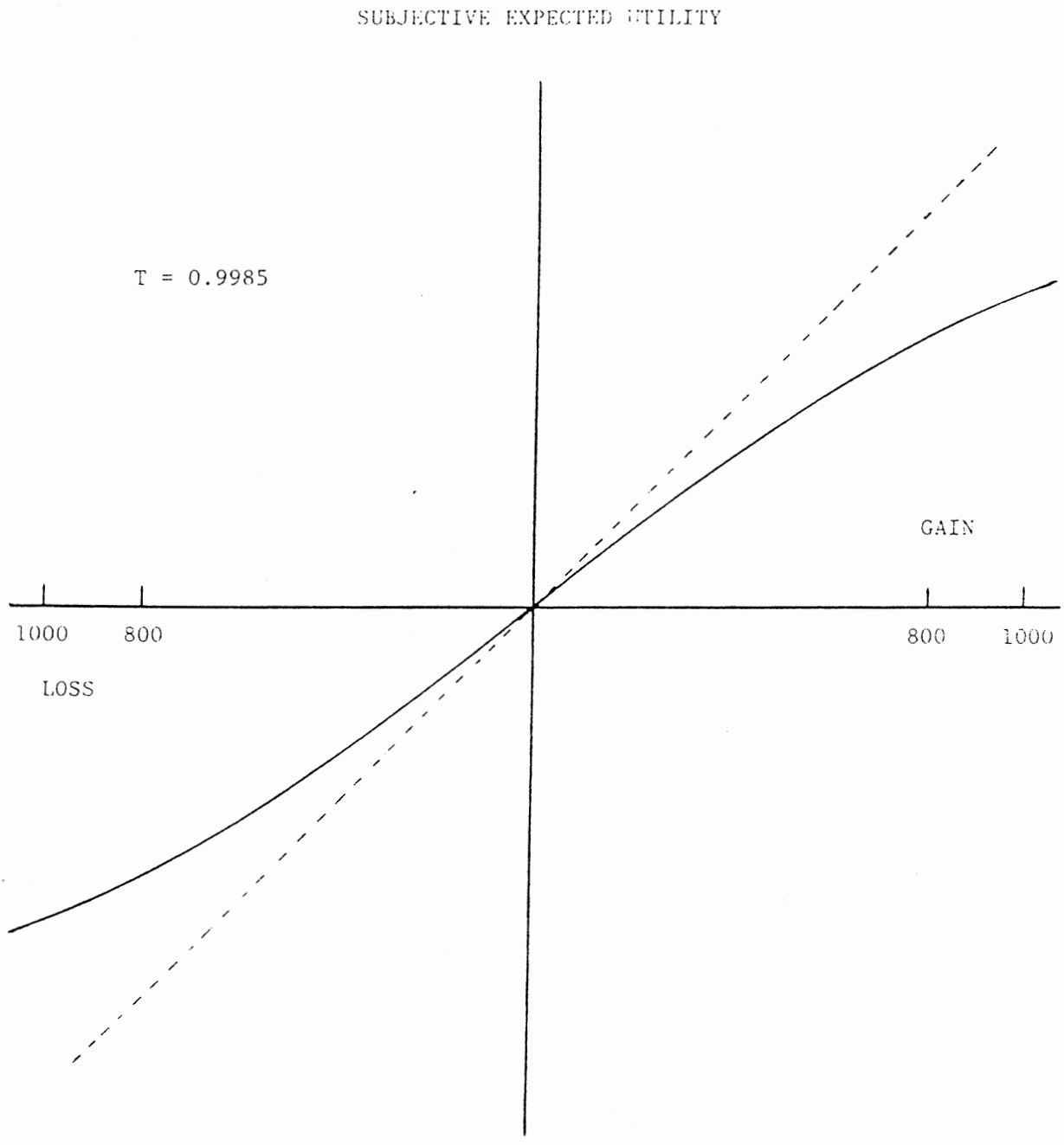
OBJECTIVE PROBABILITY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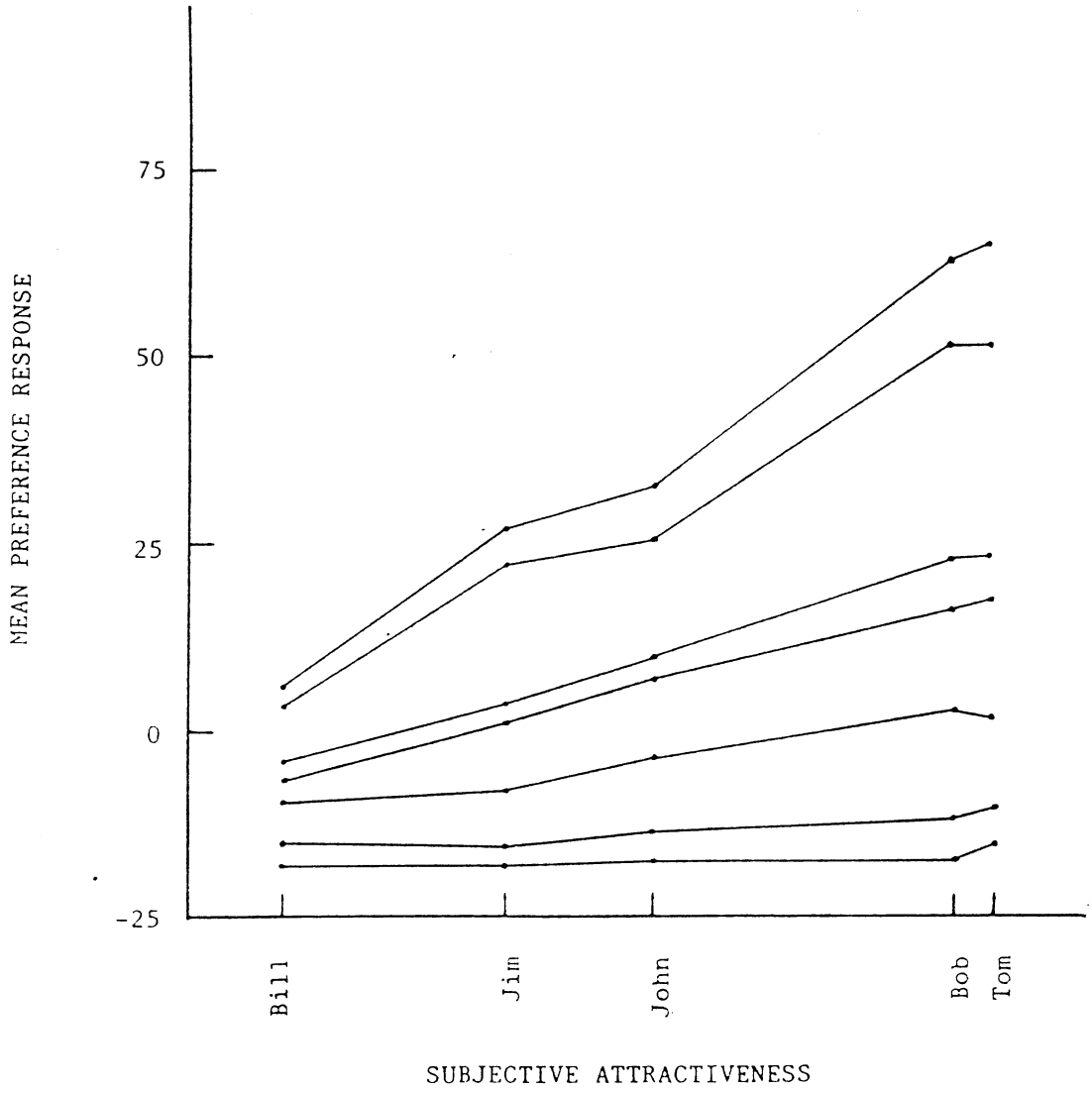
800
1000
LOSS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John
Bob
Tom
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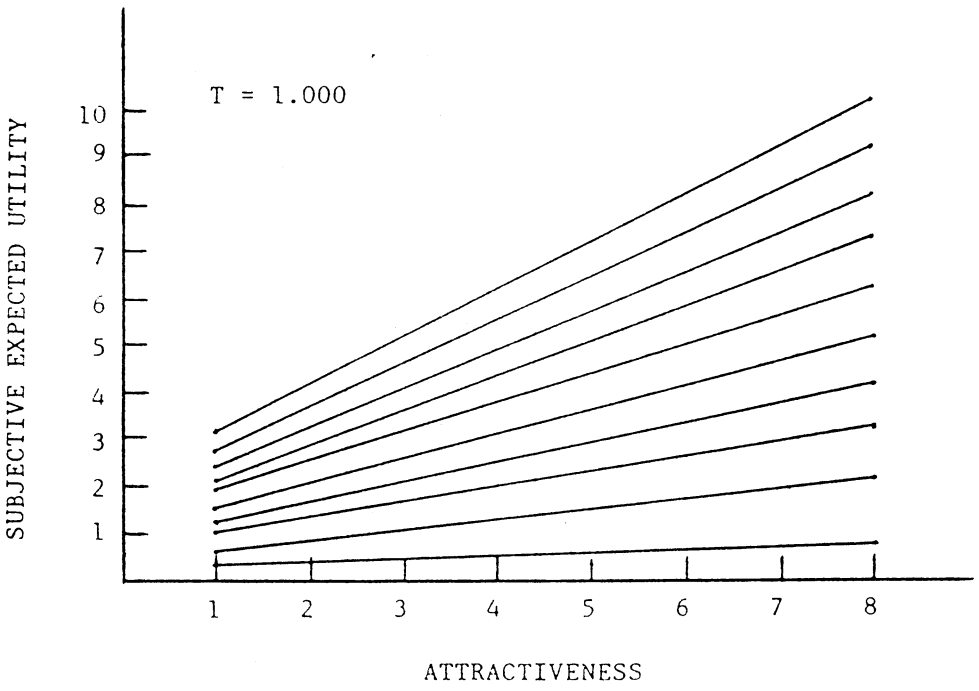
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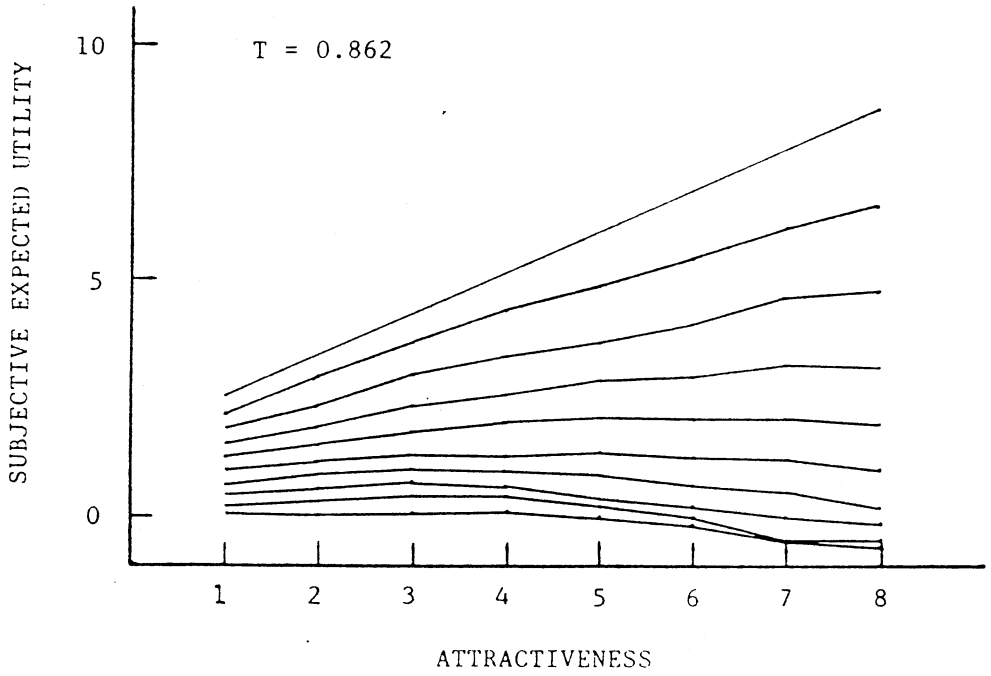
8
ATTRACTIVENESS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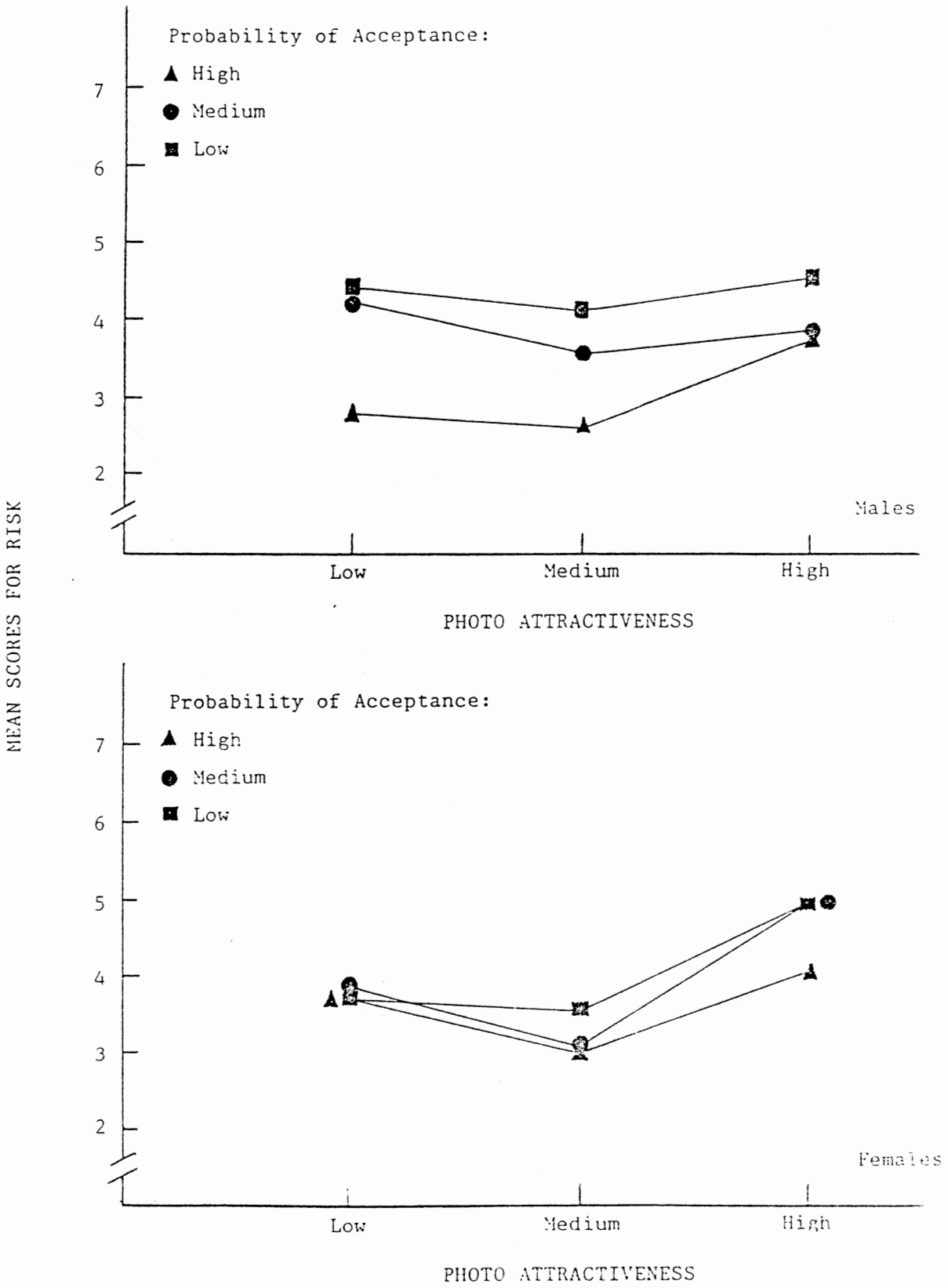
ATTRACTIVENESS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MEAN SCORES FOR RISK
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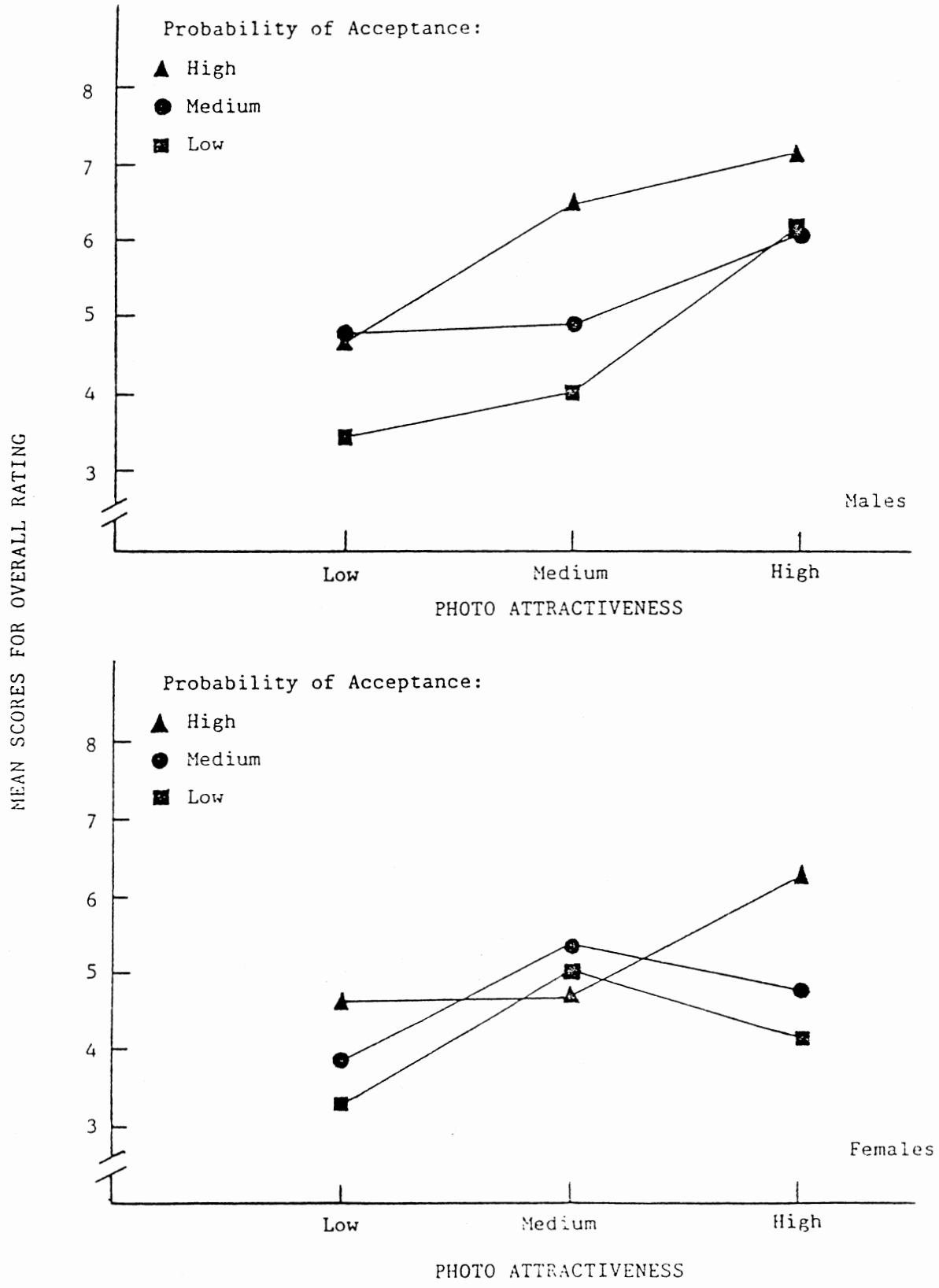
PHOTO ATTRACTIVENESS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Probability of Acceptance:
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6
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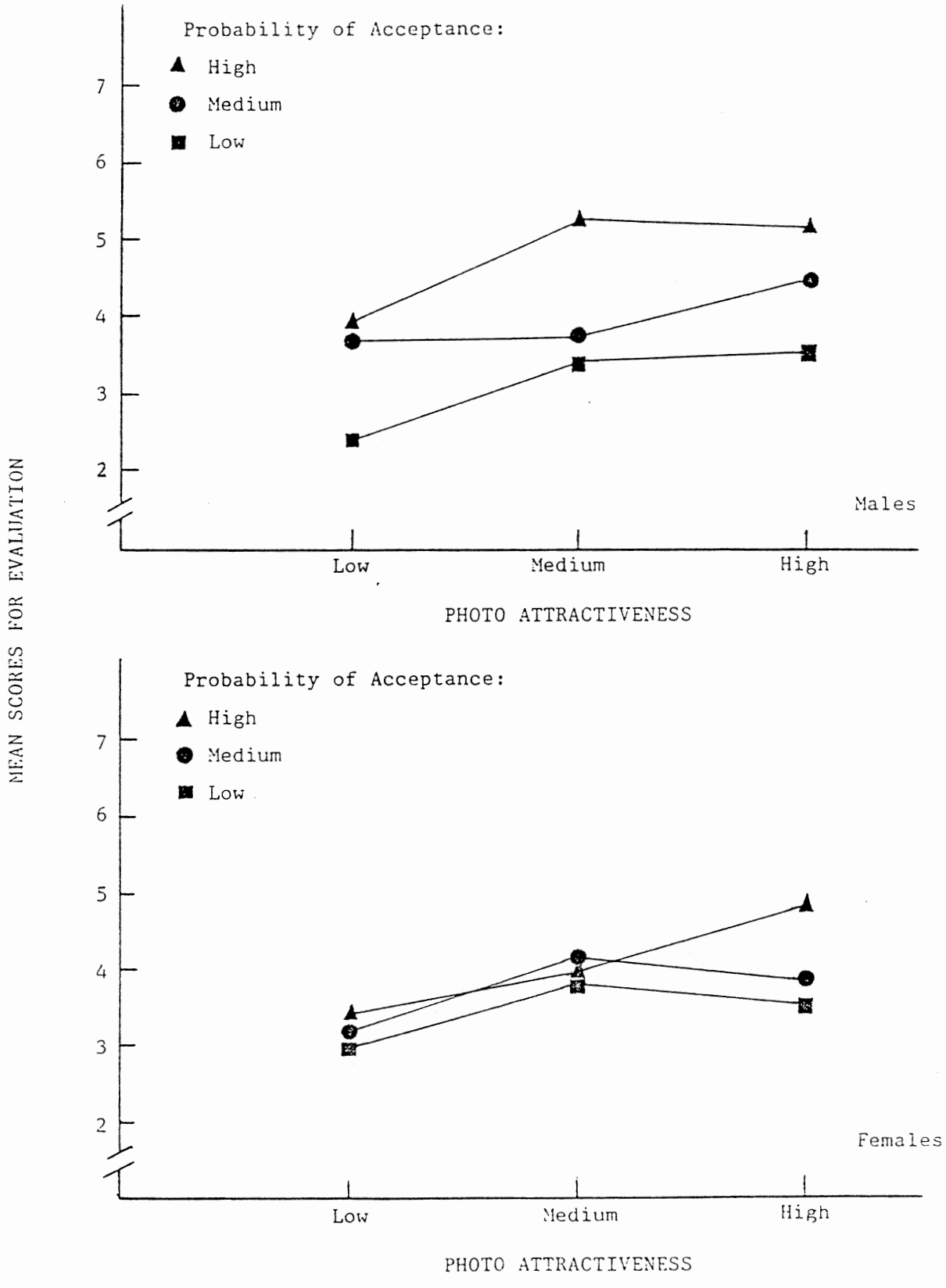
Medium
High
PHOTO ATTRACTIVENESS
MEAN SCORES FOR OVERALL RATING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3
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Males
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4
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High
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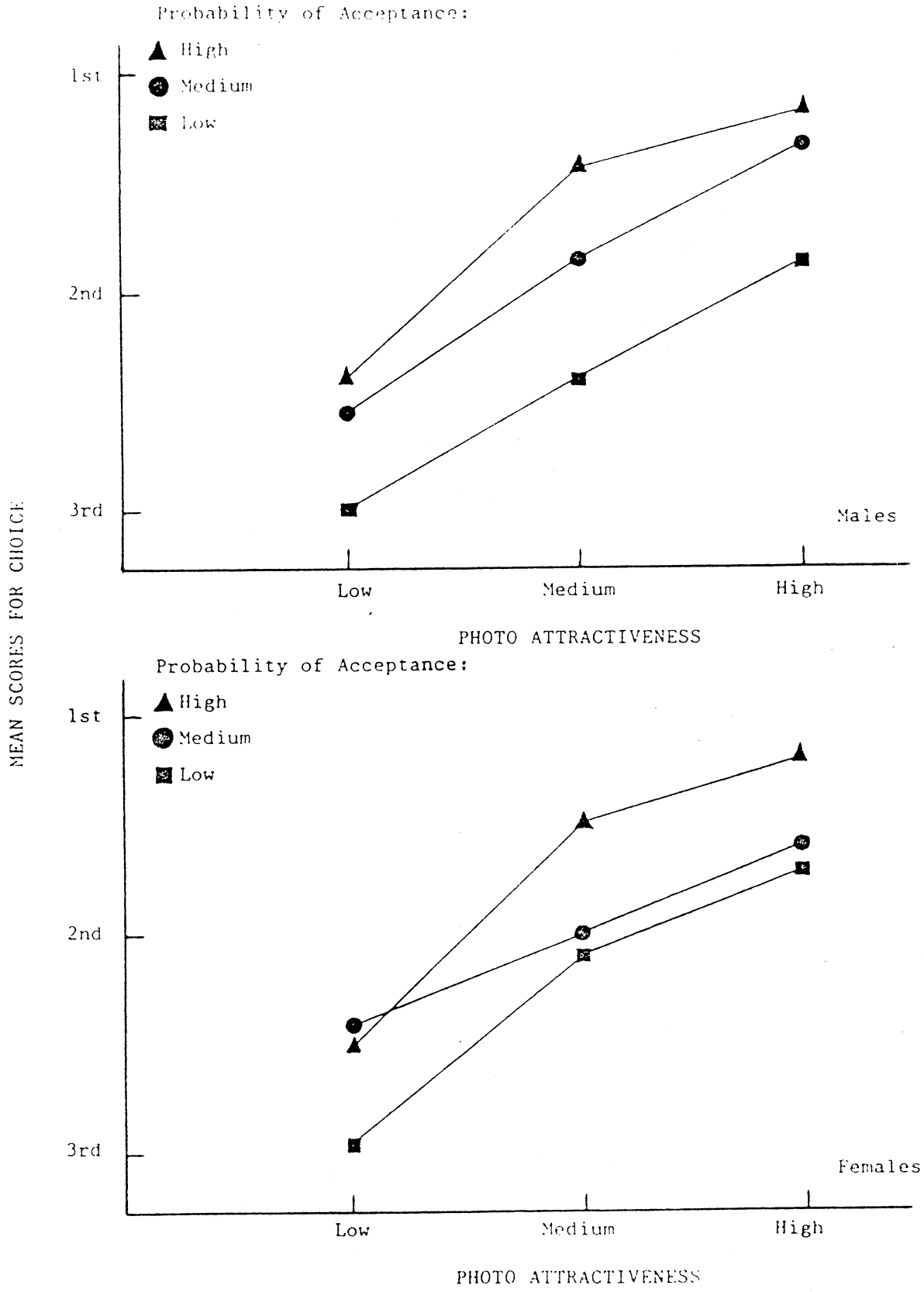
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2nd
3rd
Males
Low
Medium
High
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Medium
Low
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2nd
3rd
Females
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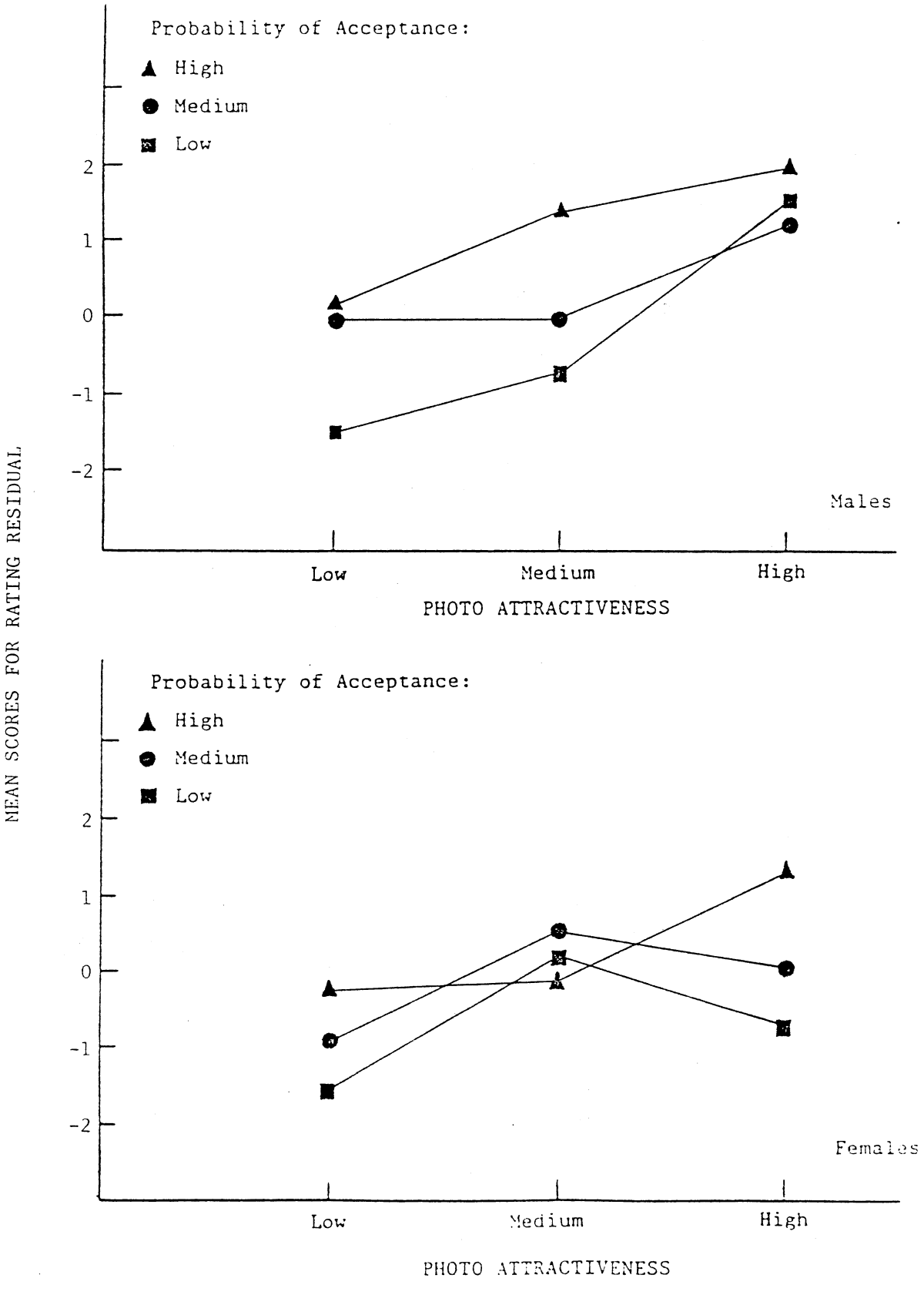
Medium
High
PHOTO ATTRACTIVENESS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Low
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0
-1
-2
Males
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Medium
High
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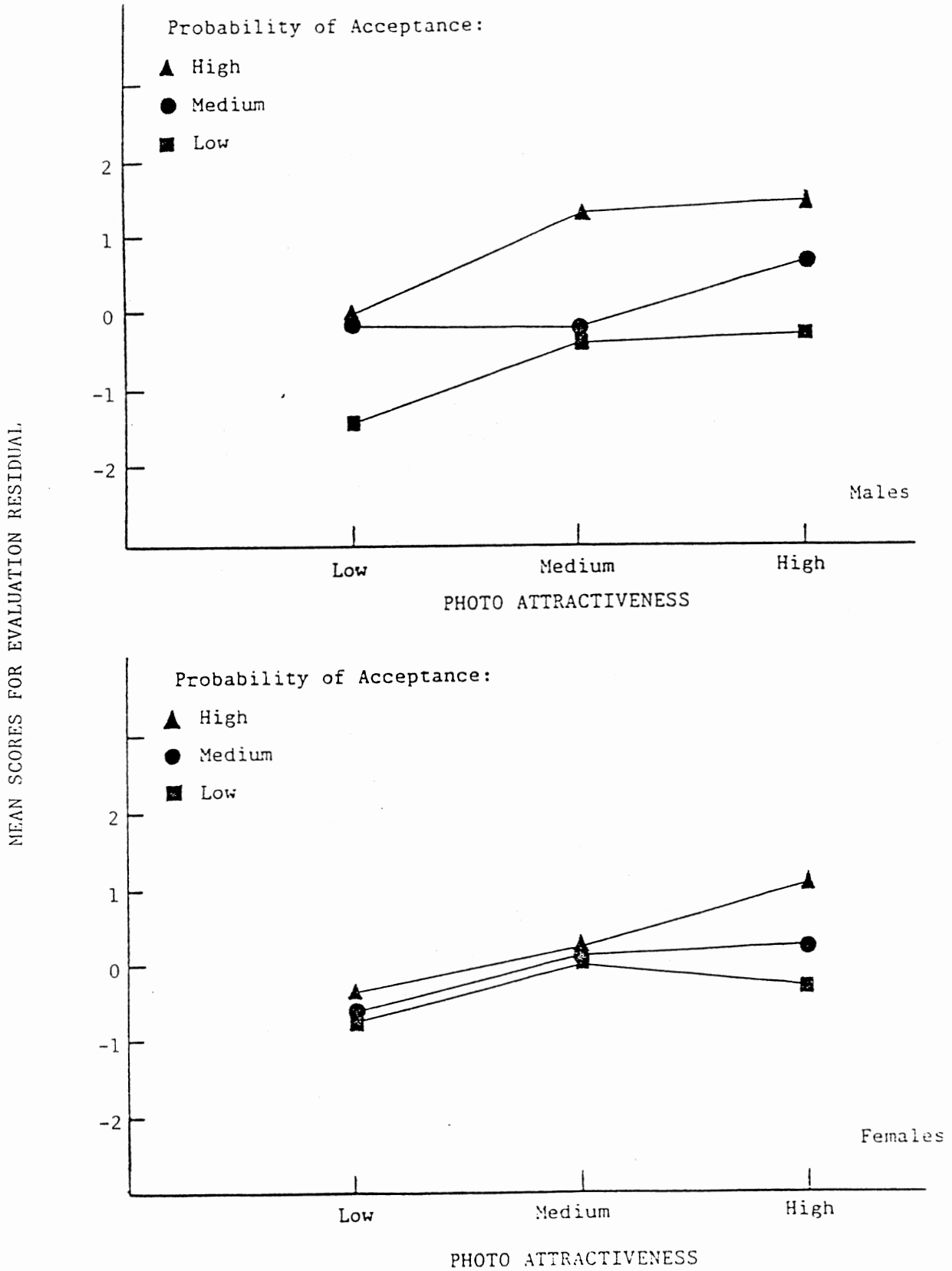
High
PHOTO ATTRACTIVENESS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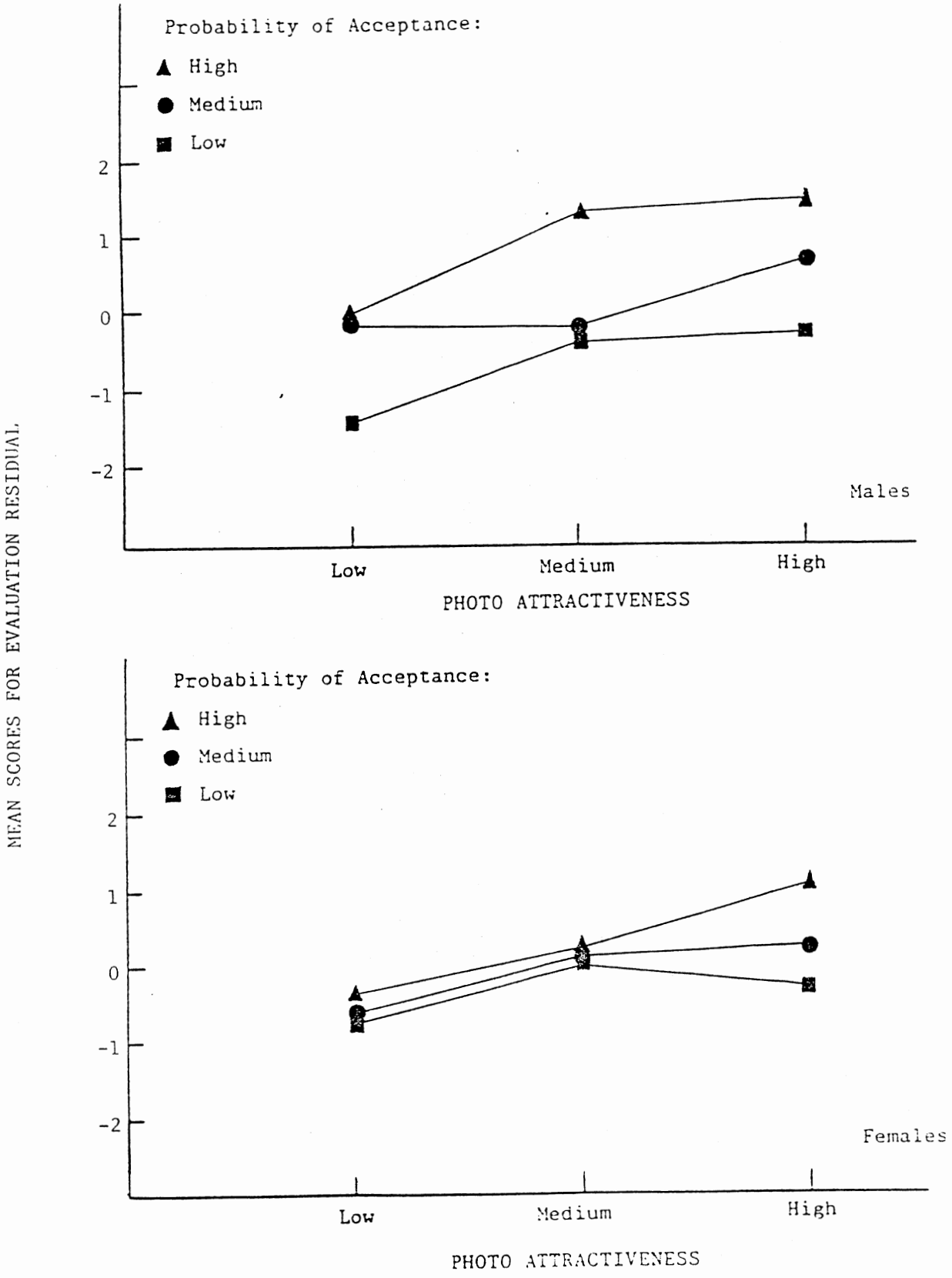
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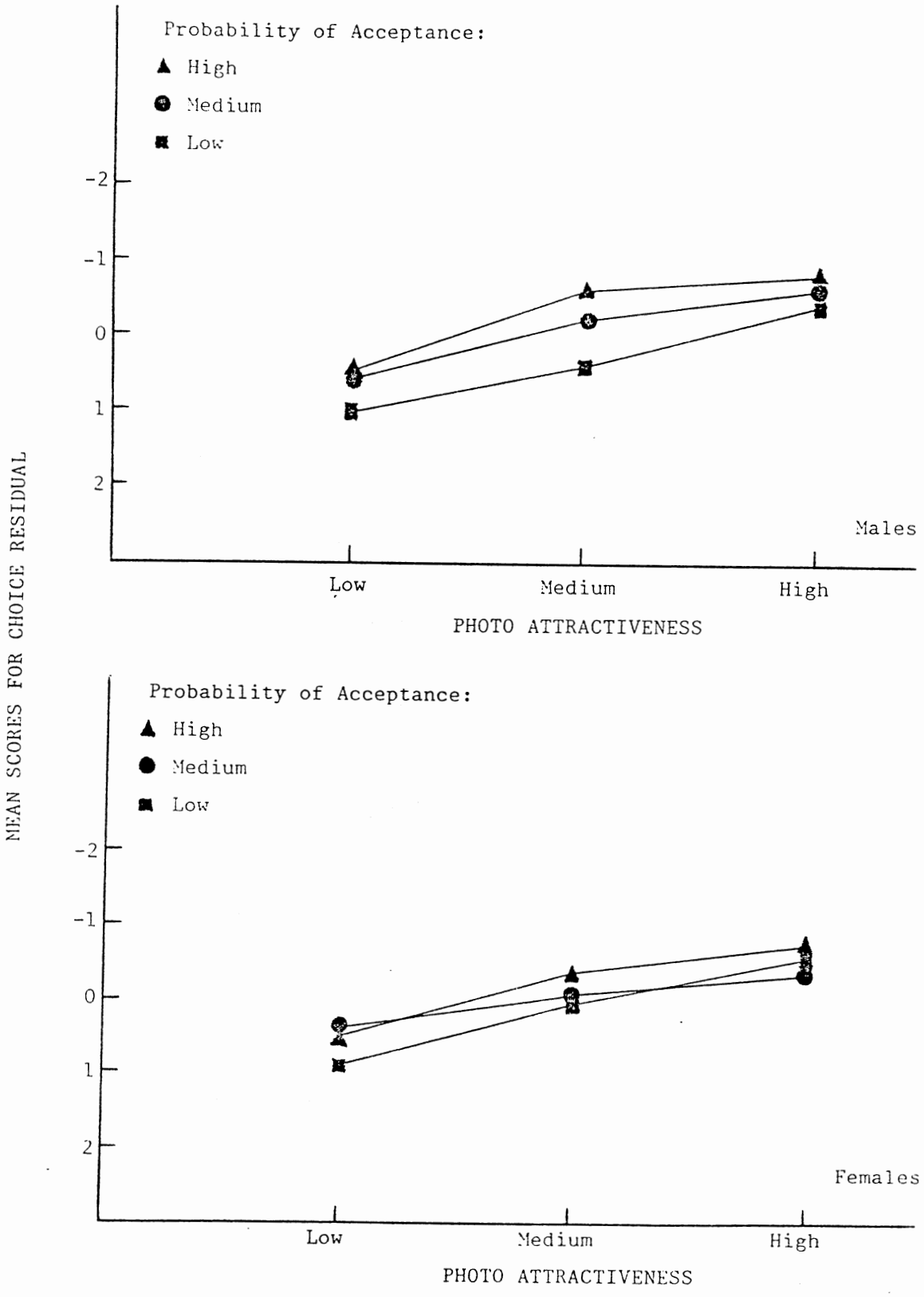
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High
Medium
Low
-2
-1
0
1
2
Females
Low
Medium
High
PHOTO ATTRACTIVENESS
MEAN SCORES FOR CHOICE RESIDUAL

VITA

Michael Joseph Parra

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