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Gender Differences in Intensity of Emotional Response:

An Evolutionary Perspective

by

Emily Z. Kleyman

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

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ABSTRACT

GENDER DIFFERENCES IN INTENSITY OF EMOTIONAL RESPONSE:

AN EVOLUTIONARY PERSPECTIVE

by Emily Z. Kleyman

Adviser: Professor R. Glen Hass

According to the evolutionary paradigms of Trivers' (1972) theory of parental investment and Buss & Schmitt's (1993) Sexual Selection Theory, the parental behaviors and mate-selection preferences of males and females are different. Such that, vis-à-vis different reproductive physiology and parental demands, females' attractiveness to males is largely a product of their fertility or physical attractiveness and males' attractiveness to females is largely a product of their ability to acquire and share resources or status.

Because emotions are defined as adaptive systems of mechanisms that are designed to monitor our interactions with our environments and signal its fitness-promoting significance, we expected participants to experience emotional responses to environmental changes that signaled changes in sex-appropriate personal characteristics.

In studies 1 and 2 it was hypothesized that male subjects would experience a more intense emotional response to changes in their status and female subjects would experience a more intense emotional response to changes in their physical attractiveness. For study 3 it was hypothesized that male subjects would experience a more intense emotional response to changes in their wives' physical attractiveness and female subjects would experience a more intense emotional response to changes in their husbands' status. Results revealed a significant 3-way interaction in each of the three studies, which supported the hypotheses of differential effects of environmental cues on the male and female participants.

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INTRODUCTION

Dating back to the time of ancient Greek philosophers, and continuing through to the seventeenth and eighteenth centuries and British empiricists, teleological questions were answered by attributing the ultimate cause for all things in this world as stemming or originating from the mind of god. It seemed impossible to conceive that 'thought' or 'mind' could arise from 'thoughtless' or 'mindless' matter.

All things animate and inanimate were also believed to posses essential properties that defined them. From Plato's Forms and Aristotle's theory of essences, to Locke's distinction between 'real' essences and 'nominal' essences, these properties were believed to be immutable, timeless, and unchangeable. When Charles Darwin published On the Origin of Species in 1859, this belief system and causal progression was reversed. Not only did he introduce the proposition that more complicated phenomena or species (maybe even ourselves) came after the less complicated, but also that they evolved from it by a 'thoughtless' and 'mindless' process he called natural selection.

Content Outline of Present Paper

First part of this paper presents the basic tenets of evolutionary theory and various models of behavior derived directly form it. Some examples of relevant research in the field of evolutionary psychology will also be presented and discussed. As well, empirical methodologies, common misconceptions and counter-arguments will be addressed and discussed.

Second part of the paper presents the historical background, theory and empirical findings in the field of emotion research. In this review emphasis is, in general, on research stemming from evolutionary conceptualization of the system of emotions, and in

particular, on emotional responses and experience involved in inter-sexual mating, intra-sexual competition for potential mates and offspring rearing.

In the third and final part of this paper empirical support is presented in the form of three studies. These studies were designed to test the hypotheses of evolutionarily derived gender differences in emotional response as a function of evaluation and self-evaluation of reproductive resources. Because of the physiological differences inherent in the reproductive processes of the two genders, comparable emotional differences were hypothesized to also exist between the two genders.

Derived from the predictions of evolutionary theory, reproductive resources for males are represented by, but not limited to, status or ability to acquire resources and the willingness to share those resources with mate and offspring. For females, on the other hand, such resources are represented by physical characteristics, such as apparent youth and physical attractiveness. Therefore, changes in reproductive resources constitute different situational factors for males and females, and it is these differences in the situational factors that give rise to the apparent differences in emotional response.

Evolutionary Psychology: Theory and Research

Darwin's "Origin of Species" & concept of 'descent with modification'. The process of natural selection, central to evolutionary theory, may be understood by noting that more offspring are produced in any one generation than will reproduce in the next, due to limited resources of food, shelter, or anything else that may be required for survival. Also noting the existence of variations in members of the same species (individual differences) or in Darwin's words the existence of "...diversity in structure, constitution, and habits..." (p.6). This diversity gives rise to the probability that some

variations will be more useful than others to the organism's ability to survive. What determines who reproduces and who does not depends on possessing the characteristics that give an advantage to the organism's welfare or survival. "Individuals possessing those characteristics will have the best chance of being preserved in the struggle for life; and from the strong principle of inheritance they will tend to produce offspring similarly characterized."(p.6)

Darwin conceptualized natural selection as a process of 'descent with modification', an incremental process by which new adaptations and new species arise as a result of differential reproductive success of individual members.

He also identified two classes of characteristics, those that have a direct effect on the survival of individual organisms, and those that affect the organisms' ability to reproduce. The long necks of giraffes, the beak shapes of finches, the structure of visual systems, taste-preferences and the thermal regulation system of our bodies, being examples of the former. While elaborate tails of peacocks, colorful coloration of male mandrills and iguanas, and the colorful plumage of various species of birds, being examples of the later. Although Darwin did not know about DNA and genes, he identified the necessity for the transmission or inheritance of characteristics from parent to offspring in the production of modifications, adaptation, and ultimately the origin of species. After all, no matter how well or how long an organism survives, those characteristics that enabled it to do so would die with it, if not transmitted to the next generation of the species through its offspring. And although the terms 'natural selection' (referring to characteristics relevant to individual survival) and 'sexual selection'

(referring to characteristics relevant to reproduction or species survival) seem to refer to two different processes, they are, in effect, two facets of the same process.

Hamilton's Concept of "Inclusive Fitness". More than a century later, Hamilton (1964) further elaborated the details of the evolutionary process of natural selection by broadening it to include not only the direct transmission of advantageous characteristics (or genes) through reproduction, but also through behaviors that increase the probability of survival of offspring and kin. Hamilton introduced the term 'inclusive fitness' and defined it as the individual's own reproductive success plus the effects of the their actions on the survival and reproductive success of their offspring and genetic relatives. Hamilton's biological approach shifted the focus of natural selection from individual organisms to that of individual genes. Genes, as the elemental components of inheritance, either increased or decreased in frequency in each generation of offspring depending on their effects on the inclusive fitness of the organism possessing them (Hamilton, 1964; Dawkins, 1989).

Hamilton's theoretical re-conceptualization of the units on which natural selection operates enabled the re-interpretation of such behavior as altruism, nepotism, and group-formation, to name a few. These behaviors were now viewed as stemming from the same principles described by Darwin (1859). Nature selects those characteristics that increase the chances of survival, but the increased chances of survival no longer referred to the entire organism, but rather to the particular genes the organism possessed.

Hamilton's contribution to the impact of the evolutionary theory on the biological and social sciences was aided, in part, by the work of Williams (1966). His Adaptation and Natural Selection translated the technical, quantitative work of Hamilton into

language and terminology readily understood. Williams' further contribution was in the articulation of the definition and criteria for what constitutes as an adaptation.

Adaptations, according to Williams (1966) are evolved solutions to specific problems that contribute to the inclusive fitness of an organism. The criteria for identifying a characteristic (physiological, behavioral, or psychological) as an adaptation include efficiency, reliability, and economy. Efficiency refers to the characteristic's quality of solving the particular problem successfully. Reliability refers to the characteristic's reliable development, under normal conditions, in every member of a species. And economy refers to the characteristic's ability to solve the particular problem with minimal costs incurred by the organism.

More recently, Tooby and Cosmides (1990, 1992) reiterated Williams' criteria, stressing that even as the physiological and psychological characteristics that our species presently possesses are the products of evolutionary processes, these products fall into the categories of either adaptations, by-products of adaptations, or random effects. With adaptations possessing the characteristics of complexity of design, economy of execution, efficiency, precision, and reliability of functioning, and a probability of occurrence greater than chance.

Trivers' Contributions to Evolutionary Theory. Further major contributions to our understanding of Darwin's theory of evolution by natural selection came from Trivers' application of the theory in the formulation of his models of reciprocal altruism (1971), parental investment (1972), and parent-offspring conflict (1974).

Unlike Hamilton's theory of inclusive fitness (1964) that specifically dealt with genetically related individuals, Trivers' reciprocal altruism theory (1971) addressed the

phenomenon of altruistic behavior toward non-kin, or genetically unrelated others. Altruistic behavior is defined as any action that increases the reproductive success of another at a cost of reproductive success to one's self. From the perspective of a gene as a unit of inheritance, the sacrifice of one's genes in the assistance of survival of another's unrelated genes seemed evolutionarily implausible. But a closer examination of altruistic behavior, initiated by Trivers (1971) revealed that such behavior would evolve or be naturally selected over selfish behavior. As long as altruistic behavior is reciprocated, it benefits both the helper and the helped, whose roles from time to time reverse (Axelrod & Hamilton, 1981; Axelrod, 1984; Cosmides & Tooby, 1992).

Trivers' (1972) parental investment model is an extension of Darwin's sexual selection explanation. It organizes the principles of mating in sexually reproducing species by explaining the behavior of the sexes in terms of costs and benefits incurred as a result of mating. According to the model, the sex that incurs more costs from mating, or invests more in producing an offspring, is the sex that will be more discriminating or selective in choosing mating partners. The sex that invests less in offspring will be more intra-sexually competitive for access to the opposite sex. If both sexes invest a great deal in the offspring (as is the case for some species of birds), then the theory would predict that both sexes would be equally selective and intra-sexually competitive. Monogamous, polygamous and polyandrous mating patterns observed in various species can likewise be predicted from the premises of this model, as well as patterns of intra-sexual competition, intra-group aggression, and the development of sexually dimorphic characteristics (de Waal, 1982; Diamond, 1992; Fisher, 1992; Geary, 1998).

The theory of parent-offspring conflict (Trivers, 1974) is an instantiation of Hamilton's (1964) inclusive fitness paradigm. Hamilton showed that helping another at a cost to oneself is evolutionarily advantageous behavior when the benefit to the other is weighed by the genetic relatedness of the two individuals involved in the exchange, thereby outweighing the costs. In the theory of parent-offspring conflict the same principle applies. Even though offspring are the vehicle of the parent's genes into the next generation, genetic relatedness between the two is only about 50 percent, on average. Therefore, the theory predicts that children will generally desire a larger portion of the parents' resources than the parents are willing to contribute. Parent-offspring conflict theory makes specific predictions regarding family and stepfamily dynamics and conflicts, sibling rivalry, patterns of child abuse, and even patterns of homicide (i.e.: Haig, 1993; Daly & Wilson, 1988; 1990).

Collectively, these theoretical and conceptual contributions to Darwin's (1859) original theory of evolution by natural selection revolutionized the social sciences. With contributions by Hamilton (1964), Williams (1966), Trivers (1971, 1972, 1974), as well as many others (Dawkins, 1986, 1989, Cosmides & Tooby, 1992; Daly & Wilson, 1981, 1983; Buss & Schmitt, 1993), the hypotheses derived from the evolutionary theory affected a wide range of research areas in the field of psychology. To be sure, the tenets of evolutionary theory sparked as much controversy and opposition as research and support. And although the base of supporting empirical findings continues to grow, misunderstandings as to the interpretation of these findings continue to persist. Before reviewing the methodology, data-gathering techniques, and empirical support for evolutionary hypotheses in psychology, it may be worthwhile to address some of the

more common misconceptions of the work in the field. Likewise, a review of the specific definitions and concepts used by evolutionary psychologists may also be helpful in the interpretation of the research.

Common Misconceptions. Oftentimes evolutionary explanations of human behavior or cognitive processes are interpreted as implying genetic determinism. Contrary to this interpretation, evolutionary explanations do not imply that behavior or cognition is strictly a product of our genes with no input from the environment. In fact, evolutionary explanation explicitly states that our behavior is a product of evolved adaptations in conjunction with environmental input that triggers their development and activation (Cosmides, Tooby, & Barrow, 1992; Buss, 1995, 1999). In fact, evolutionary perspective affords several levels from which situational, environmental, or contextual input may be analyzed. First, the historical context that exerted selective pressures on our ancestors' inclusive fitness and survival needs to be identified. Or in other words, if the claim is made that present-day behavioral and psychological adaptations are problem-solving mechanisms from our ancestral past, then we need to identify those problems.

Second, the environment in which the individual developed and the experiences that influenced development at critical periods need to be understood. For example, research shows (Belsky, Steinberg, & Draper, 1991) that father absence or father presence during childhood has an effect on the type of mating strategy women pursue in adulthood. With those raised in a father absent environment being more likely to pursue a more promiscuous, short-term strategy and those in a father present environment more likely to pursue a more monogamous, long-term strategy.

Third, the immediate contextual cues which activate the mechanism or serve as input, need to be specified if the domain and functioning of the mechanism are to be understood and explained (Tooby & Cosmides, 1990; Buss, 1995). For instance, a sexual jealousy mechanism will be activated only if there is a perception of cues to infidelity (Buss, Larsen, Westen, & Semmelroth, 1992). Similarly, a cheater detection mechanism will be activated only if there is a perception of cues of non-reciprocity (Cosmides, 1989).

Another misconception of evolution is that the theory implies that evolved behavior is unchangeable. To the contrary, evolutionary perspective allows the possibility of identifying the evolved adaptations and the environmental inputs that trigger them. Consequently, this understanding affords us the opportunity to alter our environment and gain insight into the causes of our responses. This understanding allows us to have more, rather than less, freedom in our ability to change our behavior, if we so choose.

An evolutionary perspective has also been criticized for attributing to individuals very complicated calculating abilities that are necessary to figure out, for example, degrees of relatedness as in kin selection or any other behavior affecting inclusive fitness. This is also an incorrect interpretation of evolutionary theory. In fact, evolutionary psychologists explicitly state that activation of psychological or behavioral mechanisms does not necessarily occur on a conscious level (Kenrick, 1995; Tooby & Cosmides, 1990, 1992; Buss, 1991, 1995; Dennett, 1996). Furthermore, the output of an adaptation or a mechanism is not an end product of a complex mathematical calculation, but rather an algorithm or a heuristic. And even though it may require complex mathematics to

describe adaptations, it does not require the same to execute them (Buss, 1999), as in, for example, the spinning of webs in spiders (Dawkins, 1979).

The last misunderstanding I would like to address is that of adaptations being optimal designs. Adaptations are not optimally designed (Williams, 1992). Every design has benefits and costs associated with it. Natural selection favors the design in which benefits outweigh the costs, relative to other designs. Evolution is also incremental, with more complicated designs arising from the foundations of simpler structures. This process produces within the organism a simultaneous co-existence of ancient structures with their more recent modifications, and no design is discarded when a more efficient modification has evolved.

Furthermore, because evolution is a gradual process, requiring many generations of stable selective pressure, existing adaptations are not necessarily adaptive in the present environment, and may even be maladaptive in the present environment. It has only been 10,000 years since the rise of agriculture and prior to that our species spent 500,000 years living as hunter-gatherers (Allman, 1994). As a species, we spent a relatively longer period of times (50 times longer) as hunters and gatherers than the length of time we spent in more modern social structures. For this reason, the characteristics we possess today are relatively more likely to be adaptations to the hunter-gatherer environment rather than to the modern post-agricultural world.

Adaptations & Psychological Mechanisms. Natural selection, a process by which new characteristics and hence new species come into existence, may be more readily accepted as giving rise to our physical structures and adaptations. Evolutionary

psychology, however, equally extends this explanation to the evolution of our behavioral and psychological characteristics as well.

As mentioned previously, adaptations are defined as mechanisms or systems that evolved through the process of natural selection because they solved specific problems posed by the regularities in the environment and had a direct or indirect effect on reproduction or inclusive fitness (Tooby & Cosmides, 1990, 1992). Our physiological systems, senses, and physical abilities are adaptations that evolved as a result of our successful interaction with, and exploitation of, the stable physical, chemical, and ecological properties of our world. But, 'interaction' implies behavior, and behavior is a product of information-processing. How we process and respond to information has a tremendous effect on our reproductive success and inclusive fitness.

Evolutionary psychologists use the terms 'evolved psychological mechanisms' to refer to specialized cognitive processes which, as adaptations, are 'designed' by natural selection to solve particular problems in a fitness promoting way. In identifying psychological mechanisms or adaptations it is important to differentiate between the evolved, fitness promoting design and an individual expression of it. Adaptations vary in expression, with the individual phenotypes being instances of the genotype. The underlying design for adaptations is uniform and species-specific. It is the design that is naturally selected because it is fitness promoting and not necessarily each individual expression of it (Williams, 1966).

Psychological mechanisms are domain-specific. Just as, for example, our visual system is an adaptation, which takes electromagnetic energy as input and processes that information to produce sight, psychological mechanisms take specific information from

the environment and process it to produce appropriate behavior. What defines 'appropriate' behavior depends on the particular adaptive problem an organism is faced with solving. Different behavior is appropriate when selecting something to eat than when selecting someone to mate with or some place to live. Therefore, each psychological mechanism takes different information as input, transforms it through specialized decision rules and produces a behavioral output relevant to the situation. A single, all-purpose mechanism could not, in all probability, accomplish this. An all-purpose mechanism that is not specialized for particular input and output would have to take in all available information as input, the output would therefore be a random generation of behavior (Tooby & Cosmides, 1992).

Generation & Testing of Hypotheses. Generating testable hypotheses from the evolutionary theory can be accomplished in two ways, form-to-function and function-to-form (Tooby & Cosmides, 1992). In taking the form-to-function approach, the existence of a complex and recurrent characteristic or ability is analyzed for possible underlying design. First, environmental information that serves as input for the design has to be identified, as well as the adaptive relevance of that information. Then, the output of the design has to be shown to be a solution to that problem.

In function-to-form approach, the existence and features of a design are hypothesized and tested. This may be accomplished by formulating hypotheses about the informational cues the design monitors, the decision rules it carries out or the behavior which it produces.

Evolutionary hypotheses are tested by a variety of methods. One method is to use cross-species comparisons. This method allows for the comparison of adaptations that

evolved as a result of different selective pressures. The Parental Investment Model (Trivers, 1972), for example, predicts different mating strategies as a result of the amount of investment necessary to produce and raise an offspring. Comparing species that differ in the amount of parental investment will enable a comparison of different adaptations for mate selection and different patterns of mating. Comparing different species that are similar in the amount of parental investment necessary to produce an offspring enables a comparison of adaptations that should, theoretically, function similarly.

Another method for testing evolutionary hypotheses is to utilize sex differences. Males and females have, over evolutionary time, been faced with certain adaptive problems that were gender-specific, and must have evolved different adaptations and psychological mechanisms for solving them. Once again, based on the principles of parental investment model, gender differences in mate-selection strategies were predicted and documented (Buss & Schmitt, 1993) based on the differential investment required from each gender.

Within group individual differences may be useful in identifying specific information that calibrates the functioning of hypothesized mechanisms. For example, behavior of individuals who grew up in a father-present environment can be compared to those who grew up in a father-absent environment. Responses of younger women can be compared to those of older women or men with high-status may be compared to those with low. The effects of age of a child on parent-offspring conflict may be studied using groups of different age individuals.

Experimental method can always be utilized when the formulated hypotheses contain variables that can be controlled and manipulated. The effects of context on the

ratings of physical attractiveness, effects of mood on social judgements, effects of threat on in-group cohesion, effects of context on memory and recall, and many other variables reflecting underlying cognitive structure have been studied using experimental methodology and laboratory control.

With respect to testing evolutionary hypotheses, data may be gathered utilizing any of the methods listed above. In addition, other relevant sources of data for testing evolutionary hypotheses come from archeological records, archival public records, and cultural products.

Archeological records of fossilized bone fragments can reveal not only physical shape and size, but can sometimes also be informative regarding sustained injuries, disease, and possible causes of death. Other fossilized artifacts and bones in the vicinity provide information of possible family structure, food sources, and tools.

Archival public records allow the investigation of patterns of births, deaths, marriages, and crimes from as far back as records were kept. The ability to compare these patterns of behavior from centuries past with similar patterns of behavior in today's society offers support for the existence a universal human nature.

Cultural products like magazines, fast food restaurants, music, novels, plays, movies, and games all offer insight into the people who created them. Just as archival records provide an opportunity to compare patterns of behavior, cultural products likewise provide an opportunity for comparison. The common themes found in the products of different cultures once again attest to the commonality of species-typical tendencies and give support to evolutionary hypotheses.

Empirical Evidence & Support. Empirical support for the evolutionary theory comes from a wide variety of research areas. To review all the adaptations and psychological mechanisms that have been identified and studied would be beyond the scope of this paper. Following are some representative examples of the work in the field. Included are summaries of the work done in the identification of taste preferences, landscape preferences, cheater-detection mechanisms, mechanisms for mate-selection and –retention strategies, and patterns of homicide and child abuse.

Finding enough food and selecting the right kind of food to eat are primary adaptive problems faced by all species of animals. Insufficient or inappropriate diet threatens survival. Humans (and indeed most species) have evolved various adaptations as a result of being faced by this problem. Taste preferences for sweets and salts are cross-cultural and universal, as are aversions to bitter and sour tastes. Involuntary responses of spitting, gagging, and vomiting are functional designs that prevent us from ingesting harmful substances or eliminate from our systems those that were ingested.

Morning sickness in pregnant women has also been identified as an adaptation to facilitate appropriate food selection during a critical fetal development period. Morning sickness in pregnant women during the first trimester of pregnancy is reported by up to 90% of women (Tierson, Olsen, & Hook, 1986) and heightened aversion to particular foods is believed to be experienced by almost all women (Profet, 1992). In support of the identification of this response as an adaptation research shows that the particular foods reported to be most aversive by pregnant women correspond to those with highest toxin levels (Nesse & Williams, 1994; Buttery, Guadagni, Ling, Seifert, & Lipton, 1976). Also, the timing of morning sickness, the first trimester of pregnancy, corresponds to the time

the fetus is most vulnerable to toxins. Furthermore, studies show (Yerushalmy & Milkovich, 1965; Profet, 1992) that women who do not experience morning sickness are three times more likely, than women who do, to experience spontaneous abortions.

Another survival-promoting preference believed to be an adaptation is our preference for particular landscapes. In selecting a place to live, considerations as to the availability of food and water, and protection form the elements and predators, must be made. It is unlikely that such decisions could be made randomly with equal success. Although this area of research is still in its beginnings, preliminary results show that we, indeed, seem to have a landscape preference (Balling & Falk, 1982; Kaplan, 1987; Orians & Heerwagen, 1992). Savanna-like environments are consistently rated more favorably than other types of environments. Photographs of natural, rather than man-made, environments were given more positive ratings by participants (Kaplan & Kaplan, 1992), and higher levels of satisfaction were reported by participants whose apartments had a view of trees as compared to those whose apartment views were of buildings or grassy expanses (Kaplan, 1983). In a similar vein, Orians and Heerwagen (1992) reported that participants from Australia, Argentina and the United States all showed a preference for photographs of savanna-like trees. And although initial positive evaluations and preferences involve a positive emotional response, familiarity and experience with a particular environment did not make it more preferable to the tropical one for children (Balling & Falk, 1982).

What to eat and where to live are essential concerns for survival, the ability to resolve these problems appropriately meant the difference between life and death, but

when compared to the problem of how to read another person's mind, they seem infinitely simpler.

But reading other's mind is exactly what we must be able to do if we are to be able to live together in groups. Being able to coordinate activities, recognizing a friend or an enemy, being able to tell if others are going to exploit us or cooperate with us, are abilities that, as a social species, we possess.

Tooby and Cosmides (1992) investigated social contract reasoning, focusing attention on a psychological mechanism they call 'cheater detection'. They define social contracts as situations that have specified contingencies for benefiting both parties involved; the costs to both parties involved are outweighed by the benefits to both. Cheating is defined as a violation of the social contract situation or receiving the benefit without fulfilling the contingency and thus avoiding the costs and not reciprocating the benefit to the other party.

In a series of studies using the Wason selection task (Cosmides, 1985; 1989), they showed that, even though people can not detect violations of conditional rules of logic using abstract examples (90% failure), they can do so when the violations are presented as cheating on social contracts (25% failure). Participants were presented with a multitude of scenarios and stories following the *If P then Q* logic (If a card has a vowel on one side, then it has an even number on the other side), each designed to elicit the response that would satisfy the condition. Various alternate hypotheses were ruled out by altering the content of the scenarios. For example, familiarity hypothesis was ruled out with presentation of unfamiliar scenarios (If you get a tattoo on your face, then I'll give you cassava root). By presenting conditionals that did not reflect a social contract or a

cost-benefit contingency (If a student is assigned to Grover High, then the student must live in Grover City), they were able to rule out alternate hypothesis of permission schema. And, by altering the perspective for the participants (the employee's or the employer's), Gigerenzer and Hug (1992) were able to show that the cheater detection mechanism is further calibrated by that information (If the employee gets a pension, he has worked for ten years). In short, this research presents compelling evidence of a specialized adaptation for a particular kind of social interaction, namely cheater detection in a social contract situation.

Sexual Strategies Theory & concept of Strategic Interference. Another kind of social interaction research was initiated by Buss (1985; Buss & Barnes, 1986; Buss & Schmitt, 1993), who investigated human mating tendencies and preferences, gender differences in mate selection criteria, and mate retention strategies. This line of research stems from Trivers' (1972) parental investment model, which proposes a difference between the sexes in their mate selection criteria. This difference arises from the differential degree of investment necessary from each sex in order to produce and raise an offspring to viability. In our species, as in all mammals and most primates with internal fertilization, the female makes a greater resource investment in the offspring than does the male. For the female that investment takes many forms, from physical resources and the forfeiting of reproductive capacity during pregnancy to investment of time, shelter, and food during the offspring's infancy. For the male, the minimal investment required to produce an offspring can involve no more than the act of intercourse. This disproportionate requirement leads to differential behavioral strategies in mating, such

that the sex that invests more in the offspring is more discriminating in the selection of a mate and the sex that invests less is more competitive for sexual access.

Sexual strategies theory proposed by Buss and Schmitt (1993) organized the principles of differential parental investment and allowed for the generation of specific hypotheses about the psychological mechanisms that evolved as a result. For example, because the investment that is required from the male to produce an offspring is minimal, men more than women are predicted to have evolved a greater desire for casual sex. To test this prediction, Buss and Schmitt (1993) asked their participants to indicate how many sexual partners they would ideally like to have within various periods of time, ranging from one month to their entire lifetime. The results showed that for each time interval, men desired more partners than women, within the year, for example, the average for men was slightly more than six, for women, the average was one. The difference between the number of sex partners desired by men and women increased with the interval of time, with lifetime preference for men averaging about 18 and for women between 4 and 5.

Another question posed to their participants, to test the same hypothesis, was regarding the likelihood of engaging in sexual intercourse after knowing a desirable potential partner for various lengths of time, ranging from one hour to five years (Buss & Schmitt, 1993). There were no gender differences in the rating of likelihood of having sexual intercourse with a desirable person after knowing them for five years, but for every shorter interval of time, men exceeded women in their ratings significantly.

In a study by Clark and Hatfield (1989), a different approach was used to test the same prediction. In this study a confederate approached opposite sex individuals on a

college campus and asked one of three questions: (a) Would you go out with me tonight? (b) Would you come over to my apartment tonight? or (c) Would you go to bed with me tonight? 50% of the women agreed to a date, 6% agreed to go back to the man's apartment and 0 agreed to sex. In contrast, 50% of the men agreed to a date, 69% agreed to go back to the woman's apartment and 75% agreed to go to bed with the woman confederate.

Two more related predictions were tested by Buss and Schmitt (1993), that men would impose less stringent criteria than women of desired characteristics in potential sexual partners (Kenrick, Sadalla, Groth, & Trost, 1990; Kenrick & Keefe, 1992) and less stringent exclusionary criteria in undesired characteristics. Their data showed that for the 67 previously rated desirable characteristics (Buss & Barnes, 1986) men were significantly less stringent in their standards for sexual partners than women. And for the 61 previously rated undesirable characteristics, women expressed significantly stronger exclusionary standards than men did.

Evolution and natural selection granted greater selective favor to men who engaged in short-term, casual mating with more than one partner, relative to the men who did not. The cost of such behavior was outweighed by the benefits to inclusive fitness. Empirical research lends support to the evolved psychological mechanisms facilitating this behavior. But, in order for men to have benefited from the increase in inclusive fitness, the behavior had to have been expressed, which means that willing female partners had to be identified and would have been naturally selected as well.

Short-term or casual mating carries a much greater risk for women than it does for men. However, the psychological mechanisms for greater sexual variety would not have

evolved in men if women did not take this risk and the benefits did not outweigh it. Research on how these benefits to women's inclusive fitness accrue through casual mating has been carried out to test several different hypotheses.

The most apparent motivation for women to engage in casual mating, for example, comes from the observation of the ubiquitous presence of prostitution. Prostitution exists in every society that has been studied, including Ethiopia, Germany, Tokyo, Poland, United States, to name a few (Burley & Symanski, 1981). For the women engaged in prostitution, the benefits are immediate economic resource acquisition. Resource acquisition hypothesis (Symons, 1979) was tested by Buss and Schmitt (1993) who asked their female participant to rate how desirable they found potential partners who spend a lot of money on them early on, gave gifts, and had extravagant lifestyles. Results showed that women placed a greater value on these characteristics in a short-term mate rather than in a long-term mate. Also, the reluctance to expend resources early on was rated by women as being more undesirable in a short-term than a long-term potential partner.

Another resource proposed to be of value to women is protection (Smuts, 1985). If men typically provide protection to their mates and offspring, women might benefit from short-term mating if their primary mate becomes or is incapable of doing so. To test this hypothesis, Buss and Schmitt (1993) asked their participants to rate the desirability and importance of physical strength as one of the characteristics in short-term and long-term potential mates. Their results showed that women placed a higher value on physical strength than did the men and a higher value on physical strength in short-term than in long-term potential mates.

Long-term mating strategies, as well, give rise to gender differences in the adaptive problems faced by men and women as well as gender differences in the selection criteria of a desirable mate to whom it would be beneficial to make a long-term commitment.

For women a long-term commitment from a single mate is preferable to several short-term sexual partners if the mate is able to provide the necessary resources needed for her and her offspring's survival. In selecting a long-term mate, women who selected on the basis of the potential partner's ability to acquire and willingness to invest his resources in her and her offspring were selected over the women who mated indiscriminately. Psychological mechanisms evolved as a result of this selection pressure and are evidenced by the women's preference for men who have good financial prospects and high social status, good earning capacity, and ambition (Buss & Schmitt, 1993; Kenrick, et al, 1990). Cross-cultural studies with samples from 37 different cultures including Japan, Zambia, Yugoslavia, Spain, South Africa, Finland, Australia and representing different political systems, racial groups, religious groups, and systems of mating, generated similar results (Buss, 1989a, 1989b). Furthermore, resources and status are positively correlated with age, and in all thirty-seven cultures women preferred older men.

In addition to cues signaling men's ability to acquire resources, women also showed a preference for men who displayed cues to their willingness to commit their resources on continual basis. Out 100 characteristics, women's most strongly desired quality in a long-term mate is the quality of being loving (Hendrick & Hendrick, 1992),

and their second and third most highly valued characteristics were dependability and emotional stability or maturity (Buss, 1989b; Buss, et al, 1990).

For men a long-term commitment, although limiting in the number of possible offspring, carries the advantage of attracting a higher quality mate and an increase in paternal certainty as a result of repeated and exclusive sexual access. In addition, the chances of offspring survival increase as a result of resource investment by both parents.

A high quality mate for a man is a woman of high reproductive value. That is, men who made long-term commitments to women that displayed cues of fertility and the ability to bear children would have been selected over those who mated indiscriminately. This is because women are only able to bear children during a limited time in their lives and conceive children during a limited time in their monthly cycle. Because women also have concealed ovulation and do not display their fertility, the evolved psychological mechanisms in men need to be able to focus on the characteristics that are most likely to be correlated with fertility, namely youth and physical attractiveness. And in fact, without exception, in all of the 37 different cultures studied (Buss, 1989a), men expressed a preference for younger women as wives. In addition, with increase in their own age, men prefer as mates women who are increasing younger relative to themselves (Kenrick & Keefe, 1992), such that in their thirties men prefer women who are about five years younger, and in their fifties men prefer women about 15 years younger.

Physical attractiveness and the standards of beauty as well, contrary to popular wisdom of 'beauty being in the eyes of the beholder', seem to have universal properties. Research shows that younger women are rated as more attractive than older women, regardless of the age or sex of the rater (Jackson, 1992). Infants as early as 2-3 months of

age show preference for attractive faces over unattractive faces (Langlois, Roggman, & Reiser-Danner, 1990). Ratings of photographs of Asian, Hispanic, Black, and White women by subjects of various ethnic and cultural backgrounds (Chinese, Indian, South African, English, American) showed consensus in agreement as to the most attractive (r= +. 93) and most unattractive (r=+. 94), regardless of their degree of exposure to Western media (Cunningham, Roberts, Wu, Barbee, & Druen, 1995). And Singh (1993, Singh & Young, 1995) found that women with waist-to-hip ratio of 0.7 were judged to be most attractive. His analysis of Playboy centerfolds and beauty contest winners over the past 30 years revealed a slight decrease in weight of the women but a steady 0.7 waist-to-hip ratio. Cross-cultural data also supports this preference (Singh & Luis, 1995).

Men's desire for physically attractive wives was also measured by Buss and Schmitt (1993), who found that men in all 37 cultures valued physical appearance in potential mates more than women.

Differential parental investment and gender differences in sexual strategies and mate selection criteria lead to conflict between the sexes or as Buss (1989) calls it 'strategic interference'. That is, men's greater propensity for sexual variety leads to the likelihood of adapting a short-term mating strategy and commitment avoidance, a strategy that interferes with the women's propensity for long-term mating and securing resources from the men. On the other hand, men's relatively lower paternity certainty creates the necessity to control their mates' reproductive resources by guarding or sequestering them to prevent the possibility of being cuckolded. Because of concealed ovulation in women, men have no way of knowing when their mates are able to conceive and therefore need to engage in mate guarding behavior all the time. This strategy

interferes with the women's ability to engage in short-term mating, which carries its own inclusive fitness benefits.

Because men and women often engage in sexual strategies that are conflicting, gender differences in the psychological mechanisms that evolved to solve these problems are also hypothesized to exist. Gender differences in mate retention tactics and responses to threatening cues have been documented in various research areas.

For example, gender differences in jealousy have been identified and examined. Jealousy, an emotional response to the potential loss of a partner's fidelity, is a functionally adaptive signal response that focuses attention on the relevant cues in the environment and prompts appropriate behavior. The *a priori* hypotheses regarding the gender differences in jealousy responses stem from the observed gender differences of what constitutes a threat. For men, threat comes from paternal uncertainty and the possibility of being cuckolded; for women, threat comes from a possible loss of the mate's resource commitment. In a study by Buss, Larsen, Westen, & Semmelroth (1992) gender differences were found in response to sexual infidelity versus emotional infidelity. Results showed that men were significantly more distressed by the idea that their partners engaged in sexual intercourse with someone else and women were significantly more distressed by the idea that their partners were emotionally involved with someone else. Physiological responses and cross-cultural data revealed similar patterns (Buss, et. al, 1992; Buunk, Angleitner, Oubaid, & Buss, 1996). In response to proposed alternate hypotheses for the interpretation of these data as reflecting differences in tacit beliefs about infidelity (DeSteno & Salovey, 1996), studies that controlled for possible

inferences and rendered the two types of infidelities mutually exclusive, replicated earlier results (Buss, et. al, 1999; Wiederman & Kendall, 1999).

Mate retention tactics also show evolutionarily predicted gender differences in behavior. For example, research shows that men are more likely than women to conceal their partner and threaten violence (especially against rivals), while women are more likely to enhance their appearance (Buss, 1988; Buss, 1996; Buss & Shackelford, 1997). Data also showed that men's mate retention tactics were positively correlated with perceived likelihood of their partner's infidelity and their partner's reproductive value (youth and physical attractiveness) and women's mate-retention tactics were positively correlated with their husbands' income and status (Buss & Shackelford, 1997).

Evolutionary explanations for patterns of violence, spousal homicide, and child abuse have been areas of interest and research for Wilson and Daly, who have conducted extensive research on the subject (i.e.: Daly & Wilson, 1983, 1988). For example, with respect to sexual jealousy and homicide, they cite Anglo-American common law, as well as European, Oriental, Native American, African, and Melanesian, as deeming killing one's wife, upon discovery of adultery, to be the act of a "reasonable man"(Wilson & Daly, 1992; 1993, 1996). This phenomena, although ostensibly self-defeating in terms of reproduction, makes evolutionary sense if interpreted as a strategy used by men to limit their mates' possibility of being sexually unfaithful and thereby increasing their paternity certainty. Wilson and Daly (1996) explain that a mere threat of violence would be ineffective if it is not believed or seen as a bluff, therefore "occasional follow-through may appear counter-productive, but effective threats cannot 'leak' signs of bluff and may therefore have to be sincere." In further support of the evolutionary interpretation of

spouse violence, spousal homicide data show a correlation with the wife's reproductive value, such that young and attractive women are at greatest risk of being killed by their husbands. The lowest rates of spousal homicide are among postmenopausal women (Wilson & Daly, 1988).

In a similar vein, Smuts (1995, 1996) reviews data that document the high rates of male violence against women in terms of wife beating, rape, and murder. She reports that, although the prevalence of male violence varies culturally, societies in which men are rarely violent against women are the exception, not the norm.

Men's use of violence as a tactic to increase their paternity certainty is further supported by a related phenomenon, child abuse. Because parental investment is expensive, men evolved psychological mechanisms to safeguard against being cuckolded. Situations in which men assume stepparent roles to genetically unrelated children provide opportunities to study the kind of relationships such psychological mechanisms evolved to prevent. And in fact in Wilson and Daly's (1992) documentation of the rates of child-abuse, the observed patterns shows "that stepchildren constituted an enormously higher proportion of child abuse victims in the United States than their numbers in the population-at-large would warrant". This phenomenon is present across societies and cultures and that is not an artifact of poverty or other correlates of step-relationships that have been suggested (Wilson & Daly, 1987).

In summary, I would like to reiterate the argument that emotional, cognitive, and behavioral tendencies that characterize the research presented are best understood from an evolutionary perspective because of their complexity and cross-cultural components. But at the same, we should not make the mistake of thinking that just because these

phenomena were evolutionarily adaptive for our ancestors, that they are correct, appropriate, or necessarily justifiable currently. Evolutionary theory helps us to understand human nature by investigating the kind of threats to survival we faced in our evolutionary past and does not provide us with an all-inclusive rationale for justifying currently maladaptive expressions of adaptations, but rather enables the explanation for our behavioral, cognitive, and emotional predisposition.

Emotion: Theory & Research

Defining Emotions as Adaptations. Behavioral tendencies, although at times extremely compelling, are nonetheless very susceptible to cultural pressures, sanctions, expectations, and voluntary control. Emotional responses, on the other hand, seem less so. Emotions seem to happen to us and, at times, are quiet beyond our ability to control (Ekman, 1992; LeDoux, 1992). And far from being solely a subjective, phenomenological experience, emotions are 'total body phenomena' (Tomkins, 1982). Emotions affect our cognitive faculties (Christianson & Loftus, 1991; Forgas & Moyalan, 1987; Yuille & Cutshall, 1986; Oatley & Jenkins, 1996), our physiology (Schachter & Singer, 1962; Levenson, 1994; Ekman, 1992; Panksepp, 1992; LeDoux, 1996), and behavioral tendencies (Daly & Wilson, 1985, 1990; Damasio, 1994; Ohman, 1993; Hatfield & Rapson, 1993).

Emotions are also universal; that is, empirical evidence (Ekman & Friesen, 1971; Izard, 1978, 1994) supports the premise that emotions reliably develop in every member of our species (under normal conditions), appear in very young children in the same form as in adults, and appear in individuals who are born blind (Eibl-Eibesfeldt, 1973).

Furthermore, recognizable emotionally expressive behavior can be observed in many other species (Darwin, 1872; Small, 1993; Alcock, 1993; Manning & Dawkins, 1992).

Collectively, these characteristics correspond to the previously identified criteria for adaptations, which enables an evolutionary interpretation of emotion. That is, emotions are complex in design; they are also efficient, precise, reliable, economic, and universal.

The idea that emotions are adaptations is not a recent one. In the Descent of Man (1871) and Expression of the Emotions in Man and Animals (1872), Darwin introduced the idea that anatomical structures are not the only adaptations, and that the process of evolution by natural selection applied to behavioral, mental, and emotional characteristics as well. Darwin, however, was not as concerned with the experience of emotion, as he was with the expression of it, and his supporting evidence stemmed from his observations of the similarities in emotionally expressive behavioral responses across species. Nonetheless, the implications of Darwin's hypotheses and observations are that emotions have an adaptive function that provides an advantage to the organism's chances for survival, which therefore caused them to be phylogenetically preserved and naturally selected.

Following the Darwinian interpretation, contemporary evolutionary psychologists (Buss, 1999; Johnson, 1999; Tooby & Cosmides, 1990; Nesse, 1990) also view emotions as complex systems that could only have evolved through the process of natural selection. Tooby and Cosmides (1990) for example, define emotions as discrete systems of mechanisms specifically adapted to guide or direct the organism toward solving particular problems. Each emotional state is also defined as an orchestrated functioning

of multiple mechanisms (physiological, cognitive, behavioral) which usually has a fitness-promoting outcome.

As previously mentioned, the research emphasis of Buss and his colleagues has been on gender differences in mating strategies (i.e.: Buss & Schmitt, 1993) and strategic interference that occurs as a result of pursuing conflicting strategies (Buss, 1989). However, emotions (specifically negative emotions like anger, distress, rage, jealousy) are used as dependent measures in research studies derived from sexual strategies theory and strategic interference theory (Buss, 1989; Buss, Larsen, Westen & Semmelroth, 1992). Within this range of emotional function, Buss (1999) identifies "negative emotions such as anger, distress, and upset" as "key human psychological solutions that have evolved in part to solve the adaptive problems posed by strategic interference." (p.314) The functions of these emotions consist of focusing of attention, marking events for storage in memory, and activating specific appropriate behavior. And although limited in its application, the adaptive functions of emotion Buss (1999) describes with respect to strategic interference theory may be generalized to any emotion and any situation possessing an inclusive-fitness contingency.

Nesse (1990, 1991) likewise espouses an adaptationist approach and views emotion as "coordinated systems of response that were shaped by natural selection because they increased fitness in certain situations." (p.264). Nesse & Lloyd (1992) focused on the adaptive value of self-deception and ego defense mechanisms. And from a psychiatric perspective, Nesse and his colleagues (Nesse & Barridge, 1997; Nesse & Williams, 1998) have focused on the adaptive value of such apparently negative and maladaptive emotional responses as anxiety (Marks & Nesse, 1994), panic, sadness, and

depression. Research on postpartum depression, as well has been studied from an evolutionary perspective (Hagen, 1999) and identified as an adaptation rather than an illness.

Emotion theorists as well agree that emotional responses are naturally selected, evolved adaptations (i.e.: Plutchik, 1980, 1994; Tomkins, 1980; Ekman, 1992; Lazarus, 1991, 1994; Oatley, 1992; Buck, 1984; Damasio, 1994; LeDoux, 1996). To be sure, there exists disagreement in the field regarding the way in which emotions fulfill the criteria for adaptations. This disagreement is most apparent in the branching out of research pursuits that results from the differences in the way emotions are operationally defined and the specific emotions that are identified.

Ekman (1992), for example, identifies basic emotions as physiological change accompanied by a distinct facial expression. Others (Frijda, 1987; Levenson, 1994; Scherer, 1984) extend this definition to include particular behavioral tendencies. Still others (i.e.: Izard, 1971; Tomkins, 1984; Plutchik, 1980; Buck, 1999) have proposed their own criteria for the distinction between basic and complex emotions. And although the number and identity vary (for review see Plutchik, 1980 p. 80-84; Ortony & Turner, 1990), those researchers who make this distinction agree that basic emotions are universal, evolutionarily older, and there exists a relatively small number of them. Complex emotions are viewed as a blend, mixture, or fusion of the basic ones and are characteristic of more complex, self-aware species, such as ourselves.

Ortony and Turner (1990) argue that the divergence of opinion regarding the number and identity of basic emotions stems, in part, from semantic differences in the use of the terms such as basic, primary, or fundamental. Some theorists, they point out, use

the term 'basic emotions' to refer to basic emotional concepts, others use the term to refer to biological primitives, and still others refer to psychological primitives. This lack of consensus, they argue, is counterproductive and hinders rather than furthers our understanding. They propose a different approach to the study of emotion.

Rather than attempting to identify emotions, per se, Ortony and Turner (1990) propose identifying the components of emotional responses. Such components as facial expressions (and its constituents), behavioral tendencies, cognitive appraisals, and physiological responses may be regarded as elementary building blocks of emotions. The identification of these building blocks and the combinations in which they are assembled would enable a distinction and description of different emotions without the use of terms such as basic and complex. Furthermore, this type of approach would eliminate the necessity to grant special status to some emotions and not to others. In their words "the complexity and the apparent limitlessness of different emotional feelings can be explained without recourse to a notion of basic emotions." (p. 329)

This approach seems reasonable when carried to its logical conclusion. Namely, that particular combination of physiological, cognitive, behavioral, and affective constituent elements occurring together is the emotion. However, no explanation is offered with respect to the frequency with which some combinations are more likely to occur together than others are.

LeDoux (1996) offers a different interpretation. He sees emotions within an evolutionary context, which enables the explanations for why some combinations are more likely than others. Evolution, he explains echoing the Darwinian argument, is an incremental process that gives rise to a hierarchical organization and higher level

processes are no less products of natural selection than individual responses. In his view, emotions are not composites of individual responses as Ortony and Turner propose, but are "neural systems that mediate behavioral interactions with the environment, particularly behaviors that take care of fundamental problems of survival." (p. 128). He goes on to explain that different emotions serve different functions and should therefore be regarded as separate functional units. The distinct neural systems, underlying each emotion, evolved in response to selective pressures exerted by environment and represent successful solutions to particular problems.

Each emotion, according to LeDoux (1996), consists of a set of inputs, an appraisal mechanism, and a set of outputs. The appraisal mechanism evolved to detect particular cues in the environment. When those cues are present and detected, a pattern of appropriate responses is triggered. The responses are considered appropriate if they tended to be useful in dealing with situations that triggered the appraisal in the ancestral past and assisted the organism's survival.

Species with less complex nervous systems than our own display these adaptations. And even though we can not know what other species are experiencing, the subjective experience of emotion or the affect, LeDoux (1996) maintains, is not necessary for this system to be activated, nor are higher cognitive functions (which may include appraisal or perception) necessary. Rather, consciousness and self-awareness (a relatively late evolutionary adaptation) most likely enable the psychological experience of emotion. And as sight is our conscious experience of unconscious visual processing, so is affect a conscious experience of unconscious emotional processing and is not necessary in

determining other constituent responses, but exists as a separate component (LeDoux, 1996).

This approach to studying emotion is more functional in nature and many emotion theorists have addressed the issue. Namely, if emotions are adaptations, similar to food or mate preferences, then what specific functions do individual emotions serve? The answers that have been offered in response to this question vary depending on the level of analysis, theorists' views of functional importance, and interpretation of empirical results. However, theoretical consensus seems to indicate the existence of several distinct categories of emotional function. Following is a brief review of the informational, behavioral, and social functions of emotions.

Function of Emotions. Many theorists (Mandler, 1975, 1984; Schwartz & Clore, 1983; Lazarus, 1991c; Oatley and Johnson-Laird, 1987; Oatley, 1992; Clore, 1994b; Batson, Shaw, and Oleson, 1991) view the primary function of emotions as being the function of providing information, to ourselves and/or to others. For example, Mandler's (1984) interference-emotion theory, Oatley's (1992) communicative theory of emotions, and Batson's et al. (1991) work, all stress the importance of emotions in terms of signaling or communicating to ourselves (and in social situations, to others) the evaluations of our goal attainments and the progressions of our plans. If the situation is appraised as being conducive to the attainment of our personal goals or is congruent with our plans, positive emotions follow. But, if the situation poses a hindrance to the attainment of goals or is inconsistent with, or interrupts our plans, negative emotions signal this occurrence.

Collectively these types of theories are termed conflict and evaluation theories of emotions (Mandler, 1984). In his book, Oatley (1992) elaborates on how these processes of conflict detection and evaluation might function, by evoking the modular theory of the mind for explanation. He describes a complex cognitive system as being composed of a number of relatively autonomous modules each capable of performing a specific function (such as stimulus detection and encoding, retrieval from memory of relevant associations and possible appropriate behavioral responses). And since these functions may be carried out automatically and without conscious awareness, there arises a necessity for a system or a set of processes, which would integrate and coordinate the functioning of these separate modules. Emotions serve this function by organizing the information from the relevant modules and bringing it into conscious awareness.

A slightly different description of the informative function of emotions comes from appraisal theories. According to these theorists (Lazarus, 1991c; Schwartz & Clore, 1983; Clore, 1994b; Frijda, 1994) the affective experience or the emotion is the signal to us of how a situation or event has been appraised. The function of this signal (emotion) is to alert consciousness to the significance of the situation and to serve as input for further decision-making or judgments. This functional description is very similar to the conflict and evaluation theories, if one assumes that the appraisals of situations are with respect to goals, personal goals or more innate, survival mechanisms (neither of the two types of theories require that the goals be available to conscious awareness).

Another function of emotions is to direct behavior. Frijda (1987), for example, sees emotions as primarily motivators for behavior, meant to deal with events which are significant to the individual's life or are important for survival. He agrees with Lazarus

(1984) that what constitutes such an event is the end result of appraisal processes. This end result Frijda (1987) terms 'affect', not emotion, and it is the action-readiness change which is caused by the affect that he defines as the emotion. According to Frijda (1987), the function of emotions is within the person-environment relationship and it is the aim of emotions to produce this relational behavior by either motivating an individual to maintain the relationship or to change it.

There is also a broad consensus among theorists that emotions serve a social function, although there is some disagreement regarding its role and significance. Models proposed by Frijda (1994), Scherer (1994), and Watson and Clark (1994b) primarily focus on intrapersonal aspects of emotion. However, they all include a social function as one of the functions of emotions. Emotions serve to inform others of our intentions and motives, as well as to motivate appropriate behavior in others.

Ekman (Ekman & Friesen, 1971; Ekman, 1992, 1994), on the other hand, places central emphasis on the social function, but primarily on the non-verbal communication of emotions through facial expressions. Buck (1984) lists social coordination as one of three functions of emotions (the other two being the maintenance of homeostasis and subjective experience) which is accomplished through a wide variety of communicative postures, facial expressions, and utterances or verbalizations. Oatley (1992) emphasizes the social nature of emotion by stressing that emotions are most often engaged in our experience by the actions of others, and serve to influence our relationships with others (Ekman, 1994, p. 139, parenthetically, agrees).

The emphasis on the social function of emotion by both Buck (1984) and Oatley (1992) reflects their focus on the highly social nature of our species and is reflected in the

titles of their respective books (*The Communication of Emotion*, Buck, 1984; *Studies in Emotion & Social Interaction*, Oatley, 1992). Neither theorist neglects the physiological, behavioral, and cognitive components of emotion. Rather, they bring our attention to the fact that in any species which depends on sexual reproduction for survival, there is a need for its members to be able to communicate with each other and coordinate behavior, as Buck's simplified example points out, "even if it is just to identify and attract a mate" (p. 31).

In more social species it becomes important to communicate with each other beyond the solely sexual signals, and in fact, it is the communication and the coordination of activity, which enables the formation of social structure. In other words, it may be argued that the usefulness of awareness of one's own emotional states lies in the regulation and coordination of one's own behavior (Levenson, 1994; Scherer, 1994; Frijda, 1987) and the usefulness of communication of emotional information to others lies in the regulation and coordination of social behavior (Ekman, 1994).

Communicative behavior not only aids the transmission of information in social interactions, it also serves to define, maintain, or change the social structure and the relationship of those interacting. Degrees of dominance, intensity, and intimacy; displays of hostility, aggression, and submission; and the goals of the interaction are all communicated in social encounters and reflect the motivational and/or emotional states of the participants. Eye contact, close spacing, touching, smiling, verbal content and self-disclosure are all variables in the communication of affect, either positive or negative, to others (cf.: Buck, 1984 p. 307-310). And while it is easier to identify these nonverbal communications in humans, other social non-human species exhibit similar

communicative behaviors (e.g. Small, 1993; Alcock, 1993; Manning and Dawkins, 1992; de Waal, 1988).

The main theme in Oatley's (1992) work "...is that emotions derive from cognitive processes for integrating multiple and sometimes vague goals and for managing the associated plans that are enacted with limited resources in an uncertain environment, often in conjunction with other people" (p. 43-44). After reviewing the results of a wide range of studies, Oatley concludes that uncertainty as to the outcome is the highest mainly when we form joint plans with others. It is in these situations that we may have goals and plans with very high importance value, and at the same time have very little control over their achievement or progression. Social species, like ourselves, carry out our personal plans within a society and, more often than not, they involve others. A system of specific mental states (or emotions), Oatley continues, may have evolved to function as a monitoring agent for the occurrence of goal-relevant events, sub-goal achievement, goal loss, goal conflict, etc. In our interpersonal relationships when the goals of others correspond with our own goals, this system would signal consciousness with positive affective experience, the effect of which would be to continue present action. When the goals of others conflict with our own goals this system would signal with negative affective experience and the effect would be to substitute, reevaluate, or abandon plans, or to search for approaches to conflict resolution.

In summary, the functional approach to the description and explanation of emotion focuses on the role of emotions in transmission of information, co-ordination of behavior, and social interaction. And far from being flawed vestigial responses that are inferior to higher cognitive abilities like logic, rational, and reasoning, emotions enable

reasoning and learning to take place (Damasio, 1994; Buck, 1999; Cacioppo & Bernston, 1999) and are positively correlated with more conventional measures of intelligence (Mayer & Geher, 1996).

Emotion & The Evolutionary Perspective. The functional approach, although not explicitly derived from the evolutionary theory, is in fact, highly compatible with it, and adaptationist in its underlying assumptions. The explicit reformulation of this approach into evolutionary terms allows for a more concrete explanatory basis for the phenomenon described. That is, in general the adaptive function of the system of emotions is to alert the organism to the 'survival significance' of a given situation. Several routes accomplish this. Namely, the subjective experience of affect signals the importance of the situation to the individual, as well as the positive or negative valence of it. The change in behavioral tendencies or responses prepares the individual to respond to the situation in a way that has been successful in the ancestral past. The focusing of attention enables further gathering of information with respect to the relevant details of the situation, assists learning and further decisions making, re-assessment, or coping. The social function of emotions is in the assistance in social interaction, inter-personal communication, and group cohesion.

Specifically, each individual emotion is a situation-specific adaptive response that is a co-ordination of various identified systems collectively functioning to respond appropriately to the contextual cues present in the environment. The probability of activation of a particular emotion and the intensity of emotional response reflects the degree to which any given situation resembles an inclusive-fitness contingent situation

that recurred in the ancestral past and facilitated the natural selection of a particular response over any other (Tooby & Cosmides, 1990, 1992).

An 'inclusive-fitness contingent situation' is a situation that has the potential to affect the survival or reproductive success of an organism and/or its kin. For males and females, situations that had similar potential effects on survival activate similar emotional responses. However, situations that had different potential effects would be expected to produce gender differences in the activation of emotional responses. Situations that produce gender differences in emotional responses are associated with sexually selected characteristics and reproduction. As described earlier, parental investment, mate-selection, and sexual mating strategies all constitute situation bearing different reproductive contingencies for males and females.

From the framework of Trivers (1972), Buss and Schmitt (1993), Ellis (1992), and others reviewed earlier (i.e.: Kenrick & Trost, 1993; Wilson & Daly, 1992; Studd, 1996), theory and empirical evidence suggests that males' attractiveness to females is in part a function of their status. Status is an important resource for males, in terms of being accepted as prospective mates (sexual selection), as well as being indicative of the ability to overcome rivals (male-male competition). Because gains and losses of status have important inclusive-fitness consequences for males, emotional cues to these changes in mating potential are expected to exist. Therefore, for men, more so than for women, a gain in status should be associated with positive emotion, whereas a loss in status should be associated with negative emotion.

On the other hand, females' appeal to males is more strongly influenced by their physical attractiveness (youth and apparent reproductive capacity). So, for women more

so than for men, a gain in physical attractiveness should be associated with positive emotion and the loss of physical attractiveness (the loss of youthfulness, as well as reproductive capacity) should be associated with negative emotional experience.

In other words, for men an important resource for attracting a mate is status, and the comparable resource for women is physical attractiveness.

Present research makes specific predictions about gender differences in emotional response as an evaluative assessment of changes in personal resources associated with mate-value. The hypotheses for this series of studies are predicated upon the assumptions that emotions are evolutionary adaptive systems whose function is to alert us to situational importance. As such, emotions are situation-dependent, and not necessarily gender-specific or culturally dependent (even if some components are more amenable to cultural rules than others, such as the behavioral component, for example).

Furthermore, as systems of mechanisms, emotional responses may be studied by focusing on a particular mechanism or aspect of an emotion. In this research the phenomenological experience of an emotion or its reported affect, is used as an indicator of the experience of an emotional state. Because affect is not a discrete phenomenon, intensity is used to infer the importance of a situation. That is, in numerically rating how strongly an emotion is felt at a given moment, it may be inferred that not only do greater values represent greater intensity, but also that greater intensity is indicative of greater situational importance to the individual. This interpretation is in line with the theoretical framework of Lazarus (1991c), Plutchik (1994) and other emotion theorist (i.e.: LeDoux, 1996, Buck, 1999), and empirical evidence (Brehm, 1999; Buss, 1989a).

Situational gender differences in emotion are hypothesized to stem from the general gender differences in parental investment and mating strategies (Trivers, 1972; Buss & Schmitt, 1993) reviewed earlier, and are derived directly from the predictions of the evolutionary theory. That is, greater commitment of reproductive resources and limited period of time, within a lifetime and within a monthly cycle, which characterize females' reproduction, have led to the evolution of psychological and behavioral mechanisms that seek to maximize success rate. These mechanisms are hypothesized to function by selectively attending to the cues in potential mating partners that signal ability to acquire and provide resources to her and her offspring. These same limiting characteristics of females' reproductive resources have also led to the evolution of psychological and behavioral mechanisms in males, also in order to maximize success rate of reproduction. However, these mechanisms in males are hypothesized to function by selectively attending to the cues that signal fertility, such as youth and physical attractiveness of the female.

Study 1

This study was designed to show that emotional response, by inference from reported affective intensity, is proportional to the situation's impact on the sex-appropriate personal resources of the individual. Situations that affect resources linked to the inclusive-fitness of the individual (or probability of attracting a mate) were hypothesized to elicit a more intense emotional response than situations that affect resources not directly linked to the inclusive-fitness of the individual.

The type of personal resource that is affected creates a situation that is more or less emotion-eliciting to one gender or another. Namely, the hypotheses tested were: (a) Situations that change physical attractiveness will elicit a more intense emotional response from females than from males, and (b) situations that change status will elicit a more intense emotional response from males than from females.

Method

Participants

Two hundred undergraduate psychology students (100 males, mean age = 18.4 and 100 females, mean age = 20.8) participated in the study in partial fulfillment of a laboratory requirement for their introductory psychology course.

Stimulus Materials

Each stimulus booklet contained a cover page, a relationship-prime, a stimulus vignette, follow-up questionnaire with manipulation check items, the dependent measure, and a demographics questionnaire (Appendix A).

The cover page described the experiment as a study in visualization and stressed the importance of connecting with the story on both the emotional and the intellectual

levels. The instructions also specified the necessity of making the described experience their own, visualizing as much detail as possible, with all the sights and sounds, and focusing on how it would feel if the events were truly happening to them.

To increase the salience of thoughts related to relationships, a 7-item open-ended relationship-prime questionnaire was designed and included in the stimulus booklets. The items prompted the participants to list the characteristics they believed to make someone a desirable partner, characteristics in their gender and in those of the opposite sex. The relationship-prime was gender-specific, male participants were asked such questions as, 'What kind of qualities or characteristics do you think other men look for in a wife?', while female participants were asked 'What kind of qualities or characteristics do you think other women look for in a husband?'

Four different scenarios were designed for the study in the form of page-long vignettes. Each vignette described a situation in which one of the following occurred to the reader: gain of physical attractiveness, loss of physical attractiveness, gain in status, or loss in status.

Physical Attractiveness Vignettes. The vignettes describing a gain or a loss of physical attractiveness had similar story lines. The scenarios described a personal preoccupation (or lack thereof) with a conspicuous facial characteristic, namely the nose. The nose was chosen as a manipulation for physical attractiveness due to its minimal gender-specificity connotation. Then, due to an accident, doctors were either able to correct the congenital imperfection or apologize for not being able to correct the damage caused by the accident to a previously perfect nose. This scenario provided the increase or the decrease in physical attractiveness (depending on the condition). This change was

emphasized in the passage with descriptions of the doctor's demeanor, the first look in the mirror, and the reactions of friends.

Status Vignettes. The vignettes describing a gain or a loss of status also paralleled each other in story content as much as possible. The scenarios described a corporate environment within which the reader held a particular position. Then, due to corporate restructuring, their position in the hierarchy changed, providing either an increase or a decrease in status (depending on the condition). The change in status became apparent to them as they noticed that their coworkers began to treat them differently by either becoming more dismissive or more accommodating. All other factors such as salary, responsibilities, etc. remained the same. This change in status was emphasized in the passage with descriptions of specific situations and corresponding behaviors of enhanced regard or dismissiveness by the coworkers.

The follow-up questionnaire with manipulation checks followed the vignette. It contained 7-items, including 6 multiple-choice questions reiterating the details of the story just read and intended to reinforce the content of the story. For example, one of the questions in the 'physical attractiveness-gain' condition was: "The first time you looked in the mirror after surgery, what did you notice?" It was followed by five possible answers a) how different my face looks now, b) how attractive I look now, c) how happy and excited I look, d) I noticed nothing but my perfect nose. The instructions directed the participants to circle all the choices they felt described their experience, and stressed that there were no wrong answers. These 6 multiple-choice questions served to reinforce the manipulation.

The last question, which provided a quantified manipulation check, requested the

participant to rate, on a 7-point scale, how much they felt the increase or decrease of either their physical attractiveness or status as a result of the described events in the story they had just completed reading. This particular question was specific to the condition in the booklet.

The next task in each stimulus booklet was the dependent measure and will be discussed in greater detail in the next section.

The demographics questionnaire was the last page of the booklet and contained general background information questions. Items included were questions regarding age, sex, race, religion, as well as marital status, academic status, and employment. Also included at the end of the demographics questionnaire were three items regarding the experiment. The first item asked if the story read in the visualization passage had ever happened to them in real life. The last two items asked the participants to rate themselves compared to others, on a scale of 1 to 10, on professional success and/or status, and on physical attractiveness.

Design and Procedure

In a 2 (male/female) x 2 (gain/loss) x 2 (physical attractiveness/status) between-subjects experimental design each participant received a booklet containing one of four possible scenarios. The stimulus booklets were randomly assigned to the participants. Each experimental session lasted ½ hour.

Male and female participants were run separately in groups of 5 to 15. Because the study dealt with interpersonal relationships and was specifically designed to focus thoughts on the opposite sex and mating, it was important to maintain single-sex groupings of males and females in each experimental session. This strategy also insured a

constant gender make-up of the groups rather than permit the fluctuation in gender composition that would otherwise occur, since the ratio of female to male enrollment in psychology classes is 2-3 to 1, it was decided that in order to maintain the most homogeneous atmosphere, male and female participants would be run in separate groups.

In order to control for possible differences in participant responses resulting from the presence of different experimenters, the same female experimenter collected all the data in the study.

After entering and taking a seat at individual tables with raised sides, the participants were informed that they were about to take part in a visualization study. They were told that the booklets they were about to receive contained several short, unrelated tasks, one of which was the visualization story. The participants were told that this research was similar to what athletes do when they visualize themselves competing. And that this is a powerful technique because our brain does not always differentiate clearly between real and imagined events. They were instructed to read the story and imagine the described events happening to them. They were told to do their best in trying to connect with the story on emotional and intellectual levels, and visualize as many details as they could (script in Appendix A).

Also the participants were informed that the stimulus booklets contained short tasks that were not related to the visualization experiment, and were included only in order to fill out the time allotted to the experimental session. The dependent measure was described as a scale validation procedure and not related to the visualization experiment.

Affect Measure

After reading the vignettes and completing the questionnaire included in the

'visualization experiment' (described earlier), all participants were asked to complete a 'scale validation task'. Participants were told that scale validation procedures are often carried out in the field as a means of assessing the validity of construct measurement. They were told that this task had no connection to the story-reading task they had just completed and was included in order to fill out the required length of time for the experimental session.

All participants then completed the same affect dependent measure. The dependent measure was constructed for this research with 15 positive and 15 negative emotion adjectives. The positive words were *happy, sexy, glad, sociable, attractive, cheerful, appealing, blissful, outgoing, confident, desirable, charming, extroverted, contented, and friendly*. The negative words were *alienated, hostile, sad, alone, aggravated, rejected, gloomy, annoyed, discouraged, apart, mad, disliked, unhappy, depressed, and angry*. Participants rated on a scale of 1 to 7 (1 being 'not at all' and 7 being 'very strongly') the degree to which they were experiencing each of the emotions at the present time.

For each subject a positive affect (PA) score was computed as the sum of the rating for all the positive emotion terms and a negative affect (NA) score was the sum of the ratings for all the negative emotion terms. A single score for each participant was generated by calculating the difference between the sum of all the positive affect word ratings and the sum of all the negative affect word ratings [Affect Balance $_{(\text{affect difference})} = \Sigma_{(\text{positive affect word ratings})} - \Sigma_{(\text{negative affect word ratings})}$]. Scores above 0 signify an overall positive affect and scores below 0 signify an overall negative affect (with larger numbers signifying greater intensity of affect). (Separate analyses for PA and NA scores are

included in Appendix C).

An underlying assumption for this calculation is the bipolarity of affect, with positive and negative affect scores each measuring (in a unipolar format) half of the underlying bipolar dimension, the median of which is zero. Researchers who advocate the independence of positive and negative affect (i.e.: Cacioppo & Berntson, 1994, 1999; Davidson, 1994) have challenged the justification for this assumption on conceptual and neurophysiological grounds, respectively. However, an extensive review of research, data, and theoretical models of bipolarity of affect and independence of positive and negative affect, led Russell and Carroll (1999) to conclude that "bipolar model of affect provides a good fit to available data" and "our review of the evidence turned up little or no substance to the psychometric challenge to bipolarity." (p.25) Since it is not the aim of present research to establish or verify bipolarity or independence of positive and negative affect, but rather to identify and quantify evolutionarily predicted gender difference in subjective reporting of positive and negative affect, the conceptualization of affect as a bipolar dimension proved to be both parsimonious and justifiable (see Appendix C).

Results

Reliability Analysis and Manipulation Check

Reliabilities were calculated for positive affect (PA) scores and negative affect (NA) scores. For the 15 positive terms comprising the PA score alpha = .91 and for the 15 negative terms comprising the NA score alpha = .94. The correlation between the PA and the NA scores was $r = -.38$, $p < .01$. Although the significant negative correlation between the positive and the negative affect scores supports the underlying assumption of affect bipolarity, the relationship was not high. As a result, in addition to the planned

analyses of the affect dependent measure based on the difference between positive and negative affect scores (PA - NA), the positive and negative affect scores were analyzed separately (see Appendix C).

The manipulation check question asked the subjects to rate their perception of the gain or loss experienced as a result of the events that occurred in the vignette that they had just completed reading. The ratings were on a seven-point scale, with zero being the mid-point signifying no perceived change in personal resources. Three positive values to the right of zero represented increases in perceived resources, with +1 being slight increase to +3 being dramatic increase. Three negative values to the left of zero represented decreases in perceived resources, with – 1 being slight decrease to – 3 being dramatic decrease.

The mean value for the 'physical attractiveness-gains' condition on this question was +2.08 for male participants and +2.16 for female participants. The mean value for 'physical attractiveness-loss' condition was – 1.96 for males and –2.12 for females. In the 'status-gain' condition the mean value was +2.12 for males and +2.32 for females. In the 'status-loss' condition the mean value for males was –2.04 and for females –1.83 (Table 1.1). The only significant main effect was that of gain/loss, $F_{(1,192)} = 895.2$, $p < .001$. That is, both male and female participants perceived a loss, regardless of whether that loss was in status or physical attractiveness, and both male and female participants perceived a gain, in the 'gain' conditions, again regardless of whether that gain was in status or physical attractiveness. Sex of subject main effect was non-significant, $F_{(1,192)} = .25$, $p=.62$, as well as the main effect of resource, $F_{(1,192)} = .42$, $p=.52$. No other main effects or interactions approached significance (all $Fs < .62$, $p>.05$).

Primary Data Analysis

The cell means of Affect Balance scores for each condition are presented in Table 1.2. An overall 2 (sex of subject) x 2 (gain/loss) x 2 (status/physical attractiveness) analysis of variance produced no significant main effect for the type of resource (status or physical attractiveness), $F_{(1,192)}=1.76$, $p=.19$. These results support the predictions that physical attractiveness and status are comparable resources for the two genders. No significant main effect was found for sex of subject, $F_{(1,192)}=.42$, $p=.52$, supporting the prediction that men and women do not differ from each other significantly in terms of emotionality or willingness to report it. There was, however, a significant main effect for gain/loss of resource, with $F_{(1,192)} = 22.81$, $p < .001$, $d = .34$. Not surprisingly all subjects had a more positive emotional response to gains rather than losses of resources, regardless of whether those gains or losses were in status or physical attractiveness.

Main empirical support for the experimental hypotheses of this study came from the significant 3-way interaction, $F_{(1, 192)} = 5.42$, $p < .05$, that was also found. This sex of subjects by type of resource by gain/loss interaction reflects the differential emotional response of our male and female subjects to the particular resources, with males reporting a more intense emotional response in the status conditions and females reporting more intense responses in the physical attractiveness conditions.

Planned Comparisons: 2-way Interactions and Simple Effects

The specific hypotheses this study was designed to test were: a) Situations that threaten or enhance status elicit a more intense emotional response from males than from females and b) situations that diminish or enhance physical attractiveness elicit a more intense emotional response from females than from males.

Table 1.1

Mean rating in gain / loss self-perception experienced as a result of events described in the vignettes.

a.) Status Conditions:

	Gain	Loss
Males	+2.12 N=25 SD=.60	-2.04 N=25 SD=1.02
Females	+2.32 N=25 SD=.48	-1.83 N=25 SD=1.45

b.) Physical Attractiveness Conditions:

	Gain	Loss
Males	+2.08 N=25 SD=1.08	-1.96 N=25 SD=.61
Females	+2.16 N=25 SD=.94	-2.12 N=25 SD=1.27

Table 1.2.

Mean values of Affect Balance for male and female participants in each of the four conditions:

a.) Status Conditions:

	Gain	Loss
Males	38.24 N=25 SD=15.06	1.40 N=25 SD=26.63
Females	29.00 N=25 SD=29.56	20.72 N=25 SD=25.97

b.) Physical Attractiveness Conditions:

	Gain	Loss
Males	22.40 N=25 SD=23.55	13.28 N=25 SD=20.14
Females	24.24 N=25 SD=29.04	10.56 N=25 SD=27.72

Effects of status change. The results of the status conditions are presented in graph form in Figure 1.1a. The pattern of responses in the 'status' conditions represents support for the first hypothesis for the study. That is, a significant sex of subject by gain/loss interaction was found with $F_{(1,192)} = 8.06$ and $p < .01$. The difference in affect reactions by male and female participants to gains and losses in status were greater for males than for females. The contrast between the two male groups (gain of status and loss of status) was significant, $F_{(1,192)} = 26.84$, $p < .001$, d=.86. The contrast between the two female groups was non-significant, $F_{(1,192)} = 1.36$, $p > .05$. In addition, the difference between males and females in the 'status loss' condition was $F_{(1,192)} = 7.38$, $p < .01$, d=.37 and the difference between the two genders in the 'status gain' condition was $F_{(1,192)} = .69$, $p > .05$.

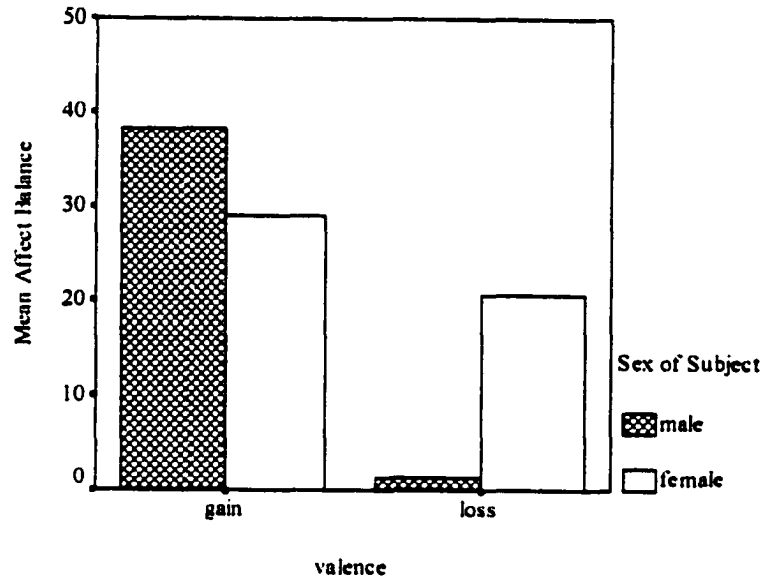
These results support the experimental hypothesis of greater emotional intensity in response to the gains or losses of status from males as compared to the females. The two scenarios, one of gain and one of loss of status, presented situations that elicited significantly different responses from the male subjects, but not from the female subjects (as reflected by the results of the cell contrast analysis).

Effects of physical attractiveness change. The results of the physical attractiveness conditions are presented in graph form in Figure 1.1b. Although the means for each of the groups were all in the predicted directions, and opposite from the pattern of responses in the 'status' conditions, these results did not reach appropriate levels of significance.

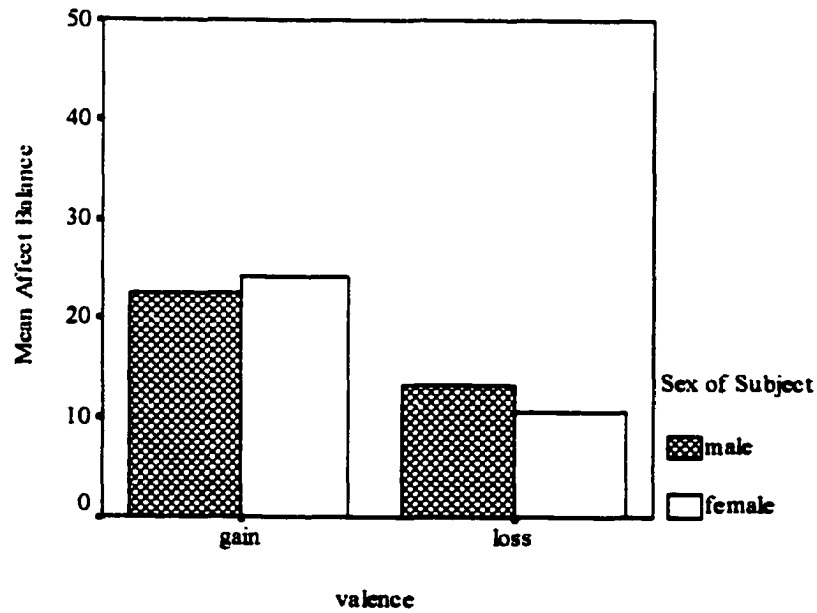
Figure 1.1

Mean values of Affect Balance for male and female participants in each of the four conditions.

a.) Status Conditions:



b.) Physical Attractiveness Conditions:



However, the sex of subject by gain/loss of physical attractiveness interaction for the resource of physical attractiveness was non-significant, $F_{(1,192)} = .21$, $p > .05$. The contrast between the two female groups (gain of physical attractiveness and loss of physical attractiveness) was significant, $F_{(1,192)} = 3.7$, $p < .05$, d=.24. The contrast between the two male groups was non-significant with $F_{(1,192)} = 1.64$, $p > .05$. Likewise, the contrasts between the two genders in the 'physical attractiveness-gain' condition was non-significant, as well as the contrast between the two genders in the 'physical attractiveness-loss' conditions, $F_{(1,192)} = .07$, $p > .05$ and $F_{(1,192)} = .15$, $p > .05$, respectively.

These results lend only weak support to the second *a priori* hypothesis for this study. That is, female participants did in fact respond with a more intensely negative emotional response to the losses in physical attractiveness and a more intensely positive emotional response to the gains in physical attractiveness than the male participants did. However, the pattern of these responses were not significantly different from the pattern of the male responses and, in addition, the patterns of male and female participants' responses did not differ significantly from each other. In other words, although the gains and losses in physical attractiveness elicited significantly different responses from the female subject but not from the male subject (as is reflected by the results of the cell contrast analysis), these patterns were not significantly different (as is reflected by the results of the sex of subject by gain/loss of physical attractiveness interaction). A possible explanation of these results became more apparent in light of the results from the analysis of the 'status' conditions.

One possible explanation for the differential patterns of responses in the status

and physical attractiveness conditions may be the result of differentially realistic stimulus. This explanation is being based on the assumption of a methodological flaw rather than a theoretical one. One possible reason for this difference may be that the status vignettes produced a more realistic, and thus more compelling, situation for the males because they were more realistic in nature than the physical attractiveness vignettes. Another possible explanation for the results may be the differential experience of the male and female participants. That is, aside from the stimulus booklets including the vignettes, the situation for the female and male subjects differed in one respect; the same female experimenter collected all the data. Thus experimenter effects may have been different for the two genders, producing differential responses to the stimuli. (I will return to this argument in the following discussion section.)

Characteristics of Sample Group and Secondary Analyses

Of the total number of female participants only 12% answered 'yes' to the question of whether the described scenario ever happen to them or to anyone they know in real life (7% in 'physical attractiveness-gain', 2% in 'physical attractiveness-loss', 3% in 'status-loss'). Of the total number of male subjects, 18% answered 'yes' to the same question (5% in each of the two 'physical attractiveness' conditions, 5% in 'status-loss', and 3% in 'status-gain'). The means for these subjects are presented in Table 1.3.

Because the distribution of participants who report having had similar experiences resulted in very small cell means, only tentative conclusions should be drawn from these results. Nonetheless, the results are interesting and suggestive. Compared to the cell means of the entire sample (Table. 1.2), the values most relevant to the experimental hypothesis for this study are the cell means of the 'status' conditions. The pattern of cell

means for the subjects who have experienced the described scenarios show a more polarized tendency when compared to the entire sample. Similar results were found by Buss et al. (1992). In his study on jealousy, Buss and his colleagues found more intense emotional response to the sexual infidelity of their mates from the male subjects who have had previous experience with committed relationships than the male subjects who have not had such experiences. No such differences were found for the female participants. And although sexual infidelity and changes in status are not ostensibly related areas of experience, it must be reiterated that the hypotheses for the present research are predicated upon the finding generated from Buss' sexual strategies theory (Buss & Schmitt, 1993) and are directly related to the gender differences found in that research.

Last two questions on the demographics questionnaire asked the participants to rate themselves compared to others, on status and physical attractiveness. The ratings were on a scale of 1 to 10, with 1 being very low and 10 being very high. A significant positive correlation was found between the status ratings and affect scores, $r=.35$, $p<.01$, and physical attractiveness rating and affect scores, $r = .38$, $p < .01$. The correlation between status self-ratings and physical attractiveness self-ratings was $r = .49$, $p < .01$. That is, participants tended to rate themselves as being more attractive and having higher status the more positive their moods were and less attractive with lower status, the less positive their moods were. These descriptive results are not surprising and provide evidence of mood-congruency effects. Better recall of information that is congruent with the mood or emotional state of the individual induced during the testing phase exhibits such effects (Teasdale & Russell, 1983; Baron, 1987; Nasby & Yondo, 1982).

Table 1.3

Mean values of Affect Balance for male and female participants who have had life experience similar to the experimental scenarios:

a.) Status Conditions:

	Gain	Loss
Males	46.67 N= 3 SD= 4.04	-1.80 N=5 SD=30.03
Females	-------	18.33 N=3 SD=23.12

b.) Physical Attractiveness Conditions:

	Gain	Loss
Males	14.40 N=5 SD=17.13	20.40 N=5 SD=13.09
Females	25.57 N=7 SD=10.88	15.50 N=2 SD=30.41

No other significant differences were found in the dependent measure scores based on the rest of the reported personal information items in the demographics questionnaire (Appendix C).

Discussion

The results of this study were encouraging. The two experimental hypotheses this study was designed to test were: (a) situations that enhance or threaten physical attractiveness elicit a more intense emotional response from females than from males, and (b) situation that enhance or threaten status elicit a more intense emotional response from males than from females and were supported by the statistically significant 3-way interaction. These hypotheses were drawn from the parental investment and sexual strategies theories proposed by Trivers (1972) and Buss (Buss & Schmitt, 1993) respectively, and from the evolutionary view of the adaptive function of emotions (i.e.: Nesse, 1989; Tooby & Cosmides, 1990). Based on these theoretical and empirical conclusions, the predictions for this study reflect the differential significance of personal resources. This differential significance stems from the gender differences in parental investment and mating strategies. And because of the direct effect of these personal resources on successful reproduction (and therefore inclusive fitness), the monitoring of these resources falls within the range of emotionally significant phenomena.

In support of one of the experimental hypotheses, the results of this study showed a greater male emotional sensitivity to the gains and losses in status. However, whereas the predicted gender differences in the 'status' conditions were shown to be statistically significant, in the 'physical attractiveness' conditions, they were not.

As previously mentioned, if the hypotheses for the study were theoretically sound

and the conceptualization of the function of emotional systems correct, then the results would suggest a methodological confound that created a disproportionately more compelling situation for the males than for the females. This discrepancy may have been the results of differentially compelling vignettes or differentially compelling experimental settings.

The vignettes used as stimuli in this experiment were designed in such a way as to artificially construct situations that focused the subjects' attention on mating and relationships in general, and their self-evaluations in the context of being chosen by the opposite sex in particular. In retrospect, it seemed likely that these situations were not wholly confined to the pages of the stimuli booklets but included the participants' entire immediate environment. Included in the environment was the experimenter, on whom their attention was focused, even if for a relatively brief period, in order to receive the instructions for the study in which they were about to participate. The experimenter also remained a prominent feature of the research environment in the front of the room during the entire experimental session.

A female experimenter collected all the data in this study. And, if emotional responses are situation-specific as hypothesized, her presence may have served as an additional visual stimulus priming thoughts of inter-sexual relationships and mate-selection criteria, their own and those of the opposite sex. This situation, incidentally created, may have served as a second relationship-prime for the male participants. The presence of the opposite sex (or a potential partner) could have intensified the importance of a situation that was designed specifically to have an effect on the salience of the individual's ability to attract a partner. This experimenter effect may have, therefore,

intensified emotional responses to the gains and losses of status described in the vignettes because changes in this resource have a direct connection to males' ability to attract a partner, in general, and a high mate-value partner, in particular. Also, it was this rationale that originally led to the decision to conduct the experimental sessions separately for each gender.

If gender of the experimenter was, in fact, the variable affecting the male responses on the dependent measure, then it becomes necessary to consider the type of effect it might have had on the female responses. Since the presence of a female experimenter did not represent a possible potential partner to the female participants, she may have represented a possible potential rival for partners thereby also affecting the intensity of emotional responses in an unforeseen direction. This possibility is investigated in study 3 and will be addressed in greater detail there.

Before attempting to redesign the physical attractiveness vignettes, it was decided to first check for the possibility of experimenter effects using the same stimulus booklets. The second study, which served as a partial replication of the first, was carried out using a male experimenter in addition to the same female experimenter. If in fact, it were the presence of a member of the opposite sex that intensified the male responses by increasing the salience (and importance) of personal resources, then a similar effect would be expected to occur with the female participants in the presence of a male experimenter.

Study 2

Building on the assumption that the presence of a female experimenter, in study 1, heightened the sensitivity of the male participants to the gain and losses of their own

status led to the hypothesis that the converse should also be true. Because, for males, status is an important personal resource in intra-sexual competition and inter-sexual selection, attention to the changes in this resource is highly relevant in the presence of other males and a female (the experimenter). For female subjects, the converse would be the case in the presence of a desirable male. Specifically, study 2 was conducted to test the hypothesis that the presence of a male experimenter would create a comparably compelling situation for the female participants as the presence of a female experimenter created for male participants in study 1.

The male experimenter in this study was the chair of the department who was asked to participate in data collection, specifically because of his position and status within the department. It was reasoned that if evaluations of relevant personal resources become more sensitive within the appropriate context (in this case a potential mate being present) then by presenting a desirable potential mate that sensitivity would be maximized.

Method

Participants

Two hundred and eight undergraduate psychology students, 107 males (mean age 19.7) and 101 females (mean age 20.3), participated in the study in partial fulfillment of a laboratory requirement for their introductory psychology class.

Stimulus Materials

The stimulus booklets in this study were the same booklets as were used in study 1 (see Appendix A). Only the 'physical attractiveness' stimulus vignettes were used in this study; the 'status' vignettes were not used. The reasoning for this omission the status

conditions was that the intent of the present study was not to conduct a complete replication of study 1, but only to test the hypothesis of possible experimenter effects in the status conditions. In order to accomplish this goal, only the conditions that did not show the predicted gender differences in study 1 were necessary. The reasoning for this is, in part, a result of constraints on the number of conditions and complexity of design. Including all the conditions would have doubled the number of conditions and the sample size necessary. In addition, because the focus of this research is on the personal resources which are significant in the selection criteria of the opposite-sex in choosing a mate, including the 'status' conditions would have served as a replication of the female experimenter's results in study 1. In addition, for the male experimenter, the 'status' conditions would present a test of the null hypothesis with the male participants (if it may be generalized from the responses of the female participants' responses to the changes in their physical attractiveness in the presence of the female experimenter (study 1). Also, because the results of study 1 showed a relative insensitivity of the female subjects to their gains and losses of status, including the 'status' conditions would have only served to replicate the non-significant results with the male experimenter.

The 'physical attractiveness' conditions were expected to produce more intense responses from the female participants in the presence of a male experimenter when compared to the responses in the presence of a female experimenter. The rationale for this expectation is similar to the interpretation of the male subjects' responses to the gains and losses in status in the presence of a female experimenter. Namely, the presence of a desirable (high status) member of the opposite sex would serve to heighten the sensitivity to the gains and losses of physical attractiveness for our female subjects. Because

physical attractiveness is a highly relevant characteristic in males' selection criteria of a mate, changes in this resource for females would be expected to elicit a more intense emotional response in the presence of a male than in the presence of another female partly because of this heightened sensitivity.

Design and Procedure

The procedure for this study was a replication of the procedure in study 1, the design, however, was slightly different. A 2 (sex of subject) x 2 (sex of experimenter) x 2 (gain/loss of physical attractiveness) between-subjects experimental design was carried out. Each participant received a booklet containing one of two possible scenarios (either gain or loss of physical attractiveness). The booklets were randomly assigned to participants. As in study 1, each experimental session lasted ½ hour; male and female participants were run separately in groups of 5 to 15.

Verbal instruction and procedure were the same as in study 1.

The same female experimenter collected half of the data, the second half was collected by the male experimenter. The male experimenter, asked to participate in data collection because of his high status, introduced himself to the participants at the beginning of each experimental session as the chair of the psychology department.

Affect Measure

Scoring procedure was the same as in study 1, with individual participants' scores reflecting the difference between the sums of all the positive affective word ratings and the sum of all the negative affective word ratings.

Results

Reliability Analysis and Manipulation Check

The reliability analysis of the PA scale produced an alpha = .89 and analysis of the NA scale produced an alpha = .92. The correlation between the PA and the NA scales was $r = -.30$, $p < .01$. Once again, the assumption of bipolarity is supported with the significant negative correlation signifying that PA and NA scores tend to diverge in opposite directions.

The 7-point manipulation check question, which asked the subjects to rate their perceptions of the gains or losses experienced as a result of the described events in the vignettes, produced the following results (presented in Table 2.1). In the presence of the female experimenter, the mean value for the male subjects in the 'gains' condition was +2.36, and the mean value for the female subjects was +2.47. In the 'losses' condition the mean value for the male subjects was –2.32, and for the female subjects was –2.20.

In the presence of a male experimenter, the mean value for the male subjects in the 'gains' condition was +2.19, and the mean value for the female subjects was +2.21. In the 'losses' condition the mean value for the male subjects was –1.83, and for the female subjects was –2.22. A zero value signified 'no change', positive values (+1, +2, +3) signified 'increase in physical attractiveness' from +1 meaning 'slight' to +3 meaning 'dramatic'. The negative numbers (-1, -2, -3) signified 'decrease in physical attractiveness', with comparable connotations for each value. Main effect of gain / loss was highly significant, $F_{(1,199)} = 1415.5$, $p < .001$. That is, regardless of the gender of experimenter, both males and females perceived the gain or loss described in their scenarios. Main effect of sex of subject was non-significant, $F_{(1,199)} = .29$, $p > .05$, as well as the main effect of sex of experimenter, $F_{(1,199)} = .10$, $p > .05$. No other main effects or interactions approached significance (all $Fs < 2.7$, $p > .05$).

Primary Data Analysis

Results of the analysis of the data from this study replicated previous findings and supported both the original hypotheses of gender differences in the intensity of emotional response and the hypothesized experimenter effects. Cell means for the data are presented in Table 2.2.

An overall 2 (sex of experimenter) x 2 (sex of subject) x 2 (gain/loss of physical attractiveness) analysis of variance produced a significant main effect of valence (gain/loss) with $F_{(1,199)} = 25.24$ and $p < .001$. Once again, not surprisingly, most subjects preferred gains to losses. There were no significant main effects for sex of experimenter or sex of subject, $F_{(1,199)} = 1.73$, $p > .05$ and $F_{(1,199)} = .29$, $p > .05$, respectively.

Analysis of variance also generated a significant 3-way interaction with $F_{(1,199)} = 12.28$ and $p < .001$. This interaction reflects the differential emotional response of our male and female subjects to the gains or losses of physical attractiveness in the presence of either the male or female experimenter. The female participants reported a more intense positive response to the gain in physical attractiveness when a male experimenter ran the session than a female experimenter, and the males reporting a less intense positive response when a male experimenter ran the session than when a female experimenter ran the session. The converse was true for the 'physical attractiveness-loss' condition.

Table 2.1

Mean rating in gain / loss self-perception in physical attractiveness experienced as a result of events described in the vignettes.

a.) Male Experimenter Conditions:

	Gain	Loss
Males	+2.19 N=26 SD=.63	-1.83 N=30 SD=1.15
Females	+2.21 N=24 SD=.83	-2.22 N=27 SD=.89

b.) Female Experimenter Conditions:

	Gain	Loss
Males	+2.36 N=25 SD=.71	-2.32 N=25 SD=.80
Females	+2.47 N=25 SD=.49	-2.20 N=25 SD=1.02

Table 2.2.

Mean values of Affect Balance for male and female participants in 'physical attractiveness – gain / loss' conditions with male and female experimenters:

a.) Male Experimenter Conditions:

	Gain	Loss
Males	6.69 N=26 SD=27.34	13.74 N=30 SD=26.57
Females	33.46 N=26 SD=20.69	-9.56 N=27 SD=28.11

b.) Female Experimenter Conditions:

	Gain	Loss
Males	18.64 N=25 SD=15.16	9.16 N=25 SD=18.49
Females	23.68 N=25 SD=17.01	7.28 N=25 SD=17.12

Planned Comparisons: 2-way Interactions and Simple Effects

The specific hypotheses for this study were: a) In situations that increase physical attractiveness, a more intensely positive emotional response will be elicited from the females than from the males, and b) in situations that decrease physical attractiveness, a more intensely negative emotional response will be elicited from the females than from the males. These two hypotheses are replicated from study 1. In addition, the new hypotheses for this study are: a) the presence of a male experimenter will intensify the positive emotional responses of the females, but not the males, in the 'physical attractiveness-gain' condition, and b) the presence of a male experimenter will intensify the negative emotional responses of the female participants, but not male, in the 'physical attractiveness-loss' condition. The intensity of the female participants' responses in the presence of the male experimenter is relative to the intensity of responses in the presence of the female experimenter. No such differences are hypothesized for the males.

Female experimenter 2-way interactions and simple-effects. The results of the participants' responses for the sessions conducted by the female experimenter are presented in graph form in Figure 2.1a. These results replicated the findings of the previous study. That is, a similar trend, albeit non-significant, is seen in the cell means for the conditions (compared with Fig. 1.1b). As in study 1, gender differences were non-significant. The 2 x 2 interaction of sex of subject by gain/loss produced an $F_{(1, 199)} < 1$ and $p > .05$. Also similar to the results from study 1, the contrast between the two female groups (gain of physical attractiveness and loss of physical attractiveness) was significant, $F_{(1,199)} = 6.8$, $p < .01$, with a moderate effect size of $d = .48$. The contrast between the two male groups was non-significant, $F_{(1,199)} = 2.28$, $p > .05$. These results

replicate previous findings, but do not lend further support for the hypotheses of gender differences. The contrast between the female groups was statistically significant and the contrast between the two male groups was not. The pattern of responses, however, revealed by the interaction, was non-significant. That is, the differences between the two female groups were not significantly greater than the differences between the two male groups (similar to the findings in study 1, represented in fig. 1.1b).

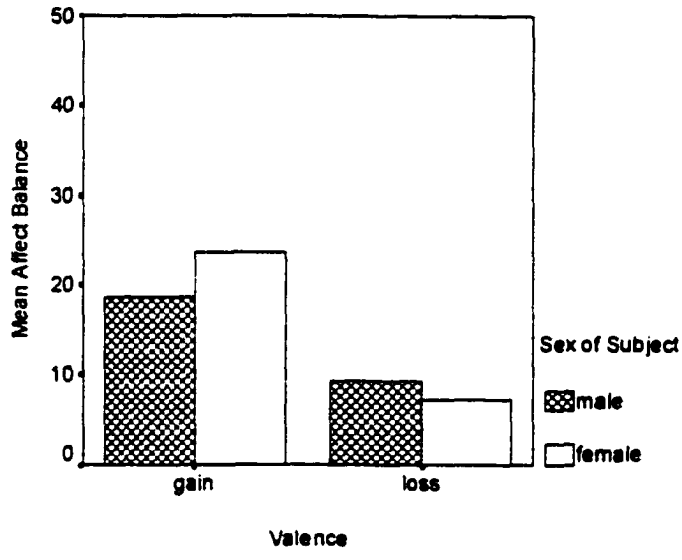
Male experimenter 2- way interactions and simple-effects. The results of the participants' responses for the sessions conducted by the male experimenter are presented in Figure 2.1b. In support of the experimental hypotheses for this study, the responses of the female participants were intensified and polarized in both directions, in the presence of a male experimenter, relative to the female experimenter. The 2 x 2 interaction of sex of experimenter by gain/loss of physical attractiveness for the female participants was significant with $F_{(1,199)}= 7.6$ and $p < .01$. These results, now more clearly support the hypothesis of greater female emotional sensitivity to the gains and losses of physical attractiveness, and underscore the importance of appropriate contextual cues.

The 2 x 2 interaction of sex of subject by gain/loss of physical attractiveness resulted in statistically significant gender differences with $F_{(1, 199)} = 34.25$, $p < .01$. These results fully support the hypotheses for this research. Namely, female participants responded more intensely positive to gain and more intensely negative to loss of physical attractiveness, than the male participants did.

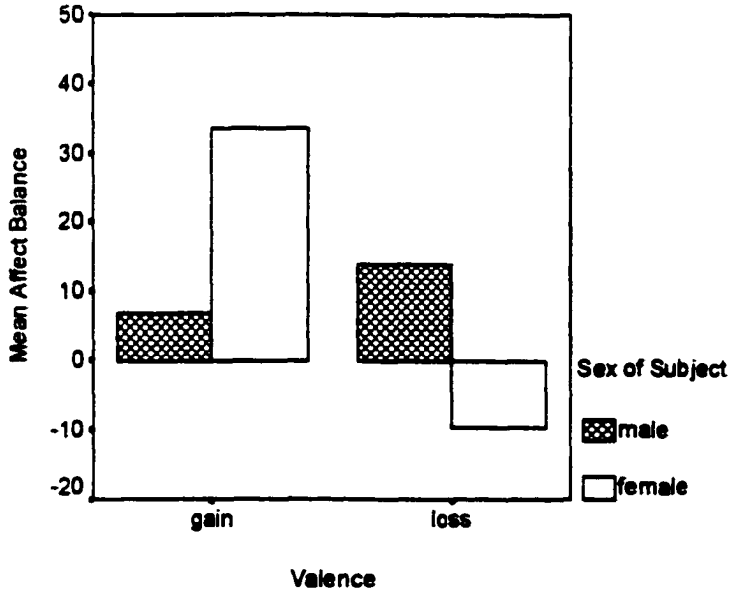
Figure 2.1

Mean Affect Balance values for male and female participants in the 'physical attractiveness gain / loss' conditions in sessions conducted by male/female experimenter.

a.) Experimenter: Female



b.) Experimenter: Male:



The difference between the two female groups was significant with $F_{(1, 199)}$=48.01, $p < .001$, and a powerful effect size of $d = .88$. The difference between the two male groups was non-significant, $F_{(1, 199)} = 1.4$, $p > .05$. Once again supporting the hypothesis of greater emotional sensitivity to the gains and losses in physical attractiveness for the female, but not the male, participants.

Characteristics of Sample Group and Secondary Analysis

Of the total number of female subjects, 14.7% answered 'yes' to the question of whether the described scenario ever happen to them or to anyone they know in real life, 7.8% in 'physical attractiveness-gain' condition (3.9% in the male experimenter sessions and 3.9% in the female experimenter sessions). 6.9% in 'physical attractiveness-loss' condition (6% in the male experimenter sessions and .9% in a female experimenter session).

Of the total number of male subjects, only 7.5% answered 'yes' to the same question, 4.6% in the 'physical attractiveness-gain' condition answered 'yes' (2% in a male experimenter session and 2.6% in a female experimenter session), 2.9% in the 'physical attractiveness-loss' condition (2% in a male experimenter session and .9% in a female experimenter session). Because the number of subjects in each cell is so small it is not possible to interpret these results. However, all cell means for the female participants are in the hypothesized direction, with more polarized responses in the male experimenter sessions than the female experimenter sessions. The male participants' cell means are in the hypothesized direction only in the female experimenter sessions.

The last two questions on the demographics questionnaire asked the participants to rate themselves compared to others, on status and physical attractiveness. Although

'status' conditions were not used in this study, the demographics questionnaire was the same as in study 1 and contained both status and physical attractiveness questions.

The ratings, as described in study 1, were on a scale of 1 to 10, with 1 being 'very low' and 10 being 'very high'. A significant positive correlation was found between the physical attractiveness rating and total affect scores, $r = .20$, $p < .01$ for the entire sample, and $r = .18$, $p < .01$ for total affect scores and status ratings for the entire sample. The correlation between status self-ratings and physical attractiveness self-ratings was $r = .40$, $p < .01$. These results once again may be interpreted as evincing evidence of mood-congruency effects.

No other significant differences were found in the dependent measure scores based on the rest of the reported personal information items in the demographics questionnaire.

Discussion

Studies 1 and 2 lend support to the conceptualization of our emotions as a system that monitors our resources and the general and immediate impact of the environment on our welfare. This system is complex and multifaceted with inter-related components of physiology, cognition, and behavior. Its function lies in monitoring relevant cues in the environment and signaling the significance of the situation to our well being with a proportional intensity of a fitting phenomenological experience of affect. The hypotheses, with respect to the gender differences in what constitutes a relevant resource and relevant cues in the environment were drawn from evolutionary theory, and therefore the results of these studies also lend support to an evolutionary model of psychological mechanisms that drive mating behavior as well.

The parental investment model and sexual strategies theory predict gender differences in mating and mate-selection criteria based on the amount of parental investment necessary to produce an offspring and raise it to viability. Based on these predictions, it was hypothesized that gender differences also exist in the resources we value in ourselves. Studies 1 and 2 investigated those differences by manipulating physical attractiveness and status. In support of the predictions, results showed a greater intensity of positive emotional response from women participants in reaction to gain in physical attractiveness, and from men in reaction to gain in status. Conversely, a greater intensity of negative emotional response was elicited from women in reaction to loss in physical attractiveness. From men similar reaction was in response to loss in status.

Furthermore, study 2 emphasized the impact of contextual cues on emotional responsiveness and the limits of experimental control. It was not possible to confine the participants' environment and their emotional experience to the pages of the stimulus booklets. In these studies the experimenter also presented a relevant environmental cue. Such that, the experimental sessions in which the sex of the experimenter was opposite to the sex of the participants, emotional responses were intensified in the predicted directions.

However, it may be argued that our society raises females to value physical attractiveness and males to value status, the observed results stemming from the differential cultural socialization of boys and girls. The next step, in order to build a more compelling case for the evolutionary predictions of context-specificity, rather than gender-specificity, of emotional response, is to show a complementary and situation-specific effect. And once again, the hypotheses are generated from the predictions of

evolutionary theory.

Specifically, the next study was designed to test the hypotheses that a more intense emotional response from women could be elicited to the loss of status and a more intense emotional response from men could be elicited to the loss of physical attractiveness. This effect can be shown if the gains and/or losses of these particular resources are experienced by one's spouse.

To reiterate, if emotional system's function is to monitor the significance of situations with respect to our survival or reproductive success, then situations that have an effect on it will be accompanied by an emotional experience. Studies 1 and 2 have shown that changes to personal resources, which have an effect on our ability to attract perspective mates (or high-value mates), are associated with intense emotional responses, proportional to those resources' impact on our desirability to the opposite sex.
Our choice of partners or mates equally has an impact on our reproductive success. And any change in the resources that make our partners a more or less valuable mate does not just affect their reproductive success (or inclusive-fitness), but also impacts ours, especially if a long-term commitment has been made.

Study 3

This study was designed to test the following hypotheses: a) Situations that diminish or enhance physical attractiveness elicit a more intense emotional response from males than from females, if the participants' spouse experiences that change. And b) situations that enhance or diminish status will elicit a more intense emotional response from females than from males, if the participants' spouse experiences that change. In other words, male participants will respond with greater emotional intensity to the gains or losses of their wives' physical attractiveness, and female participants will respond with greater emotional intensity to the gains or losses of their husbands' status. That is, in contrast to the hypotheses and results from studies 1 and 2, the resource, changes in which eliciting a more intense emotional response from females than from males, will be status. And a comparable resource for males' more intense emotional response will be physical attractiveness.

Furthermore, in studies 1 and 2, presence of an opposite sex experimenter amplified or polarized the reported emotional intensity in the relevant personal resource conditions by increasing the salience of opposite sex selection criteria. Specifically, males' responses to changes in status, not physical attractiveness, were amplified in the presence of a female experimenter and females' response to changes in physical attractiveness were amplified in the presence of a male experimenter.

In this study experimenter effects are not hypothesized to influence the participants' responses as in the previous two studies. This reasoning stems from the fact that the experimenter's gender would no longer serve as a direct salience cue to the participants' self-evaluations of their ability to attract members of the opposite sex. But

rather, the experimenter's gender would serve as a potential comparison to their imagined spouses for the participants, thus indirectly affecting their self-evaluation by means of the comparison between their 'spouse' and the experimenter. However, no matter how much less powerful the effects, gender of the experimenter is hypothesized to amplify the reported emotional responses in the same sex conditions. That is, in this study, the sex of the experimenter serves as a salience cue to intra-sexual competition and the relative standing in comparison to potential rivals or competitors.

In the opposite-sex conditions, the presence of the experimenter still serves as a salience cue to the existence of potential partners, however, this study was designed to manipulate not only the resources of the spouse, but also the type of the relationship. The participants were instructed to imagine a long-term commitment, with no possibility of ending it. If this manipulation succeeds, then the presence of opposite-sex experimenter would not represent an availability of other potential partners (since no potential would theoretically exist) and the participants' responses will be amplified. If, on the other hand, the manipulation does not succeed, than the intensity of emotional response to the changes in the spouse's resources would be attenuated, because it would not represent a condition that is permanent. For this reason multiple manipulation checks were included in the stimulus material booklets.

Method

Participants

Three hundred and twenty-seven undergraduate psychology students (166 male, mean age = 19 and 161 females, mean age = 20) participated in the study as partial fulfillment of a laboratory requirement for their introductory psychology class.

Stimulus Materials

Each stimulus booklet contained two cover pages, a stimulus vignette, follow-up questionnaire, the dependent measure (same as that used in studies 1 and 2), two evaluation questionnaires (one evaluating the visualization part of the experiment, one evaluating the experimenter), a sociosexuality scale (Gangestad & Simpson, 1990), and a demographics questionnaire. In order to emphasize that each questionnaire in the stimulus booklets was a separate task, different fonts and page formats were utilized (Appendix B).

The first cover page described the 'Research Stimuli Packet' as a collection of different tasks that were put together in order to provide the participants with experience of the kind of research some of the scientists in the field are conducting. The tasks in the packet were specified as being unrelated and different, and included questionnaires, surveys, and a visualization experiment.

The second cover page described the 'visualization experiment' as a study in 'Perspective-taking and cross-cultural understanding'. The printed instructions stated that this study was part of a research project designed to investigate our ability to understand intellectually and emotionally people form very different cultural backgrounds. The participants were informed that they were about to read a story of a fictitious culture very different from their own. They were to read it and visualize, as vividly as possible, the events described in the story. It was stressed that the story was about them and that they were to attempt to connect with it on emotional as well as the intellectual level. It was explained that: "...in order for us to be able to understand others, it is important that we are able to put ourselves into their places in life, even if it's only by imagining ourselves

there."

Four different two-page long, gender-specific vignettes were designed for this study. Each stimulus booklet contained one of the following vignettes: the spouse gains in status, the spouse loses in status, the spouse gains in physical attractiveness, or the spouse loses in physical attractiveness. The scenarios were gender-specific, that is, a husband was described for the female participants and a wife was described for the male participants.

All four vignettes had certain key elements in common. Namely, all story lines began by establishing that the reader (the participant) has always known who their husband/wife was going to be because in 'their' culture marriages are arranged at birth. Also, the stories described them as looking forward with anticipation to meeting their husband/wife and spending the rest of their life together. Divorce was described as something that is not possible or desirable in their culture. And even though they have heard of other cultures where divorce is allowed, to them it seems just as bizarre as being allowed to quit your family, your mother and father, if they did not always make you happy.

The wedding ceremony was next described. The future husband/wife was described as walking in and taking his/her place next to the reader (who is either the groom or the bride, depending on the gender of the subject). This is described as the first time the reader sees his/her spouse.

At this point, in the 'status' conditions the spouse is described as coming from a good family and being kind and intelligent. He/she is described as holding a position within the city council that either allows them the enjoyment of the privileges such a

position affords ('status-loss' condition) or not receiving the respect they deserve ('status-gain' condition).

In the 'physical attractiveness' conditions, the spouse is described as attractive with beautiful eyes and a perfect nose ('physical attractiveness-loss' condition) or the spouse is described as having beautiful eyes, and would be considered attractive except for a slightly misshapen nose ('physical attractiveness-gain' condition).

In all conditions the reader is described as looking forward to spending his/her life with their new husband/wife and that their spouse feels the same way.

Then two years are said to have passed and their son is almost a year old. Once again, in all the conditions the reader is informed that they find this marriage emotionally rewarding and look forward to having more children. They have grown to love their spouse and can not imagine a life without him/her. The differences between the conditions are as follows.

Physical Attractiveness Vignettes. The vignettes describing a gain or a loss of physical attractiveness had similar story lines. In addition, care was taken in designing the scenarios to be as gender-neutral as possible so that the vignettes about husbands or wives were also as similar as possible in their story line, with minimal changes necessary for gender pronouns.

Similar to studies 1 and 2, physical attractiveness was manipulated by either permanently correcting or permanently damaging the nose of the spouse. Once again, the nose was chosen because it was the most gender-neutral physical characteristic and at the same time conspicuous enough to be significant to physical attractiveness.

The scenarios described the reader as arriving in the hospital to find their spouse

with bandages on his/her face. They are informed that their spouse was in an accident. When the bandages are removed, the 'natural deformity' that their spouse previously had was either permanently corrected (providing a gain in physical attractiveness) or the perfect nose that their spouse previously had could not be fully restored (providing a loss in physical attractiveness).

Status Vignettes. The vignettes describing a gain or a loss of status also paralleled each other in story content as much as possible, as well as the vignettes for husbands and wives.

The scenarios described the city's unification with a neighboring town, which doubled the population and brought new people into the city council, in which the readers' husbands or wives held a position. This change in the staff created a situation that either raised their spouse's standing within the council or lowered it (providing either a gain or a loss in status), while the position, duties, and responsibilities remained the same. This change in status the reader's spouse experiences in the way others start to treat them differently, either by becoming more dismissive of them ('status-loss' condition) or more accommodating ('status-gain' condition).

The follow-up questionnaire after the vignettes, similarly to studies 1 and 2, served two purposes, to reinforce the visualization and to check the effectiveness of the manipulation. It consisted of eight items, six multiple choice and two 7-point Likert scale items. Included were instructions at the top of the page, which reiterated the importance of visualization and stressed that no correct answers to the questions existed, and that this was merely a request for honest disclosure with a guarantee of anonymity. The participants were instructed to circle all the choices that they felt applied as answers to

the multiple-choice items.

The two 7-point Likert scale items were items #1 and #8. The first items asked the participants to rate their perception of the attractiveness or status (depending on condition) of their spouse at the beginning of the story. The last item asked the participants to rate their perception of the increase or decrease of either status or physical attractiveness (once again, depending on the condition) of their spouse as a result of the events described in the story.

The six interposed multiple-choice questions reiterated the details of the story just read. For example, a question in the 'physical attractiveness-loss' condition was: "How did you know the doctor was disappointed with the outcome (of the facial surgery)?" It was followed by three possible answers: a) the sympathetic tone of his voice, b) his nervous expression, c) his apparent refusal to meet my eyes. A question in the 'status-gain' condition read: "What was your reaction to your wife's apparently raised position?" The following multiple choice included: a) I felt relieved, b) I felt joyful, c) I felt proud, and d) I felt important. The instructions to circle all the answers that applied were reiterated for each item.

Following the manipulation check were the instructions for the dependent measure and the dependent measure. Both were the same as were used in studies 1 and 2. The instructions explained that the following was a 'scale validation' task and was unrelated to any of the tasks they had previously completely.

After the dependent measure, a page of instructions reiterated the guarantee of complete anonymity. It also explained that the following was several questionnaires that included personal questions and sometimes, sensitive issues, the participants were

directed not to write their names anywhere in the booklets and asked to answer as honestly as they could.

Next was a 9-item 'experiment evaluation questionnaire'. The instructions at the top of the page explained the in order to assist data analysis and interpretation, it would be helpful to have more information about the experience the participants had in reading the story of the 'visualization experiment' they had earlier completed. The first item, in a 'yes or no' format, asked if a similar experience, as the one described in the story, ever happen to them or someone they knew, in real life. The rest of the items, except for one other, were answered on a 5 or 7- point Likert scale.

The participants were asked to rate the success of their visualization of the culture described and the social custom of arranged marriage. The ratings were on a 5-point scale with 1 being "not at all" and 5 being "very successful". In a 'yes or no' format, they were than asked if the idea of divorce had, nonetheless, entered their minds as they were reading the story.

The rest of the questions (items 5 through 9) were with regard to the personal beliefs and values that may have affected the perceptions of the events described. All the items were on the 7-point scale, with –3 being "strongly agree", 0 being "have no opinion" and + 3 being "strongly disagree". The items included questions about views on divorce, gender equality, and spousal infidelity. For example, "Divorce is not the only answer if a marriage is in trouble, most problems can be worked out" and "Most married people are unfaithful to their spouses at some time during their married lives."

Following was an adapted version of the sociosexuality questionnaire (Gangestad & Simpson, 1990) consisting of eleven items. It was designed to gather information

regarding sexual and romantic experiences of the participant (from the original scale), as well as views on sexuality, commitment, and "casual" sex (additional questions not part of Gangestad & Simpson, 1990 scale). Some of the questions included were "Have you ever been in a serious or committed romantic relationship", "With how many people have you had sex only one time", and how strongly do you agree or disagree with the statement: "sex without love is OK".

The demographics questionnaire was the last page of the booklet. It consisted of general background information, such as age, race, religion and religiosity, as well as birthplace, academic year and present employment.

A separate questionnaire followed the participants' completion of their booklets and consisted of two pages. It was entitled "Experimenter Evaluation Questionnaire" and was presented not as a part of the research of the experimenters, but rather as a mandatory questionnaire distributed to all researchers by the American Psychological Association to be completed by participants in all research projects carried out in the field.

Printed instructions on the top of the first page explained that the APA needed to regularly update standards and policy with respect to their ethical principles and experimenters' conduct. The subtitle on this page was "Part I: Professional Conduct & Demeanor". The participants were requested to rate, as honestly as they could, how much they agreed or disagreed with each of the following five questions. Some of the questions included were "The experimenter was helpful", "The experimenter made me feel inferior", and "The experimenter was polite". A 7-point Likert scale followed each question, on this scale –3 represented "strongly disagree", 0 represented "didn't notice",

and +3 represented "strongly agree".

The second page of this questionnaire was entitled "Part II: Gender-Related Issues". The next line, in bold and underlined font, read: "Answer only if your experimenter is opposite sex from you! If your experimenter is the same sex as you, please skip this page." Following were specific instructions that informed the participants of the importance of gender-sensitive behavior issues to the policies of the APA. Then, the instructions read: "Important: Please regard the following questions as a survey of possible issues that the APA might need to address, and not as a critical evaluation of yourself or your experimenter."

Four questions followed the instructions at the top of the page. The first asked the participants to rate, on a 7-point Likert scale, how attractive they found the experimenter. The rest asked for a rating of how likely they would be to socialize with the experimenter (at a later time and place), or get to know the experimenter better (maybe date the experimenter).

Design and Procedure

A 2 (sex of subject) x 2 (sex of experimenter) x 2 (gain/loss) x 2 (status/physical attractiveness) between-subjects experimental design was carried out. For similar reasons as in studies 1 and 2, male and female participants were run separately in groups of 5 to 15. Each experimental session lasted approximately 45 minutes. To maintain consistency and increase the internal validity of this set of studies, male and female experimenters in this study were the same individuals as in study 2.

Again, similar to the previous studies, after entering and taking their seats at individual tables with raised sides, the participants were informed that they would be

taking part in laboratory research in partial fulfillment of their course requirement. They were then informed that upon completion of their booklets, they were to drop the entire packet in a box, taking care not to identify themselves or write their names anywhere on the distributed materials. They were informed that someone, other than the experimenter present, would later empty out the box and analyze the data (script in Appendix A).

The stimulus booklets were then randomly assigned to the participants. After about 40 minutes, and at about the time most participants were finished with their booklets, the two-page "APA" questionnaire was distributed to all.

After all had completed their tasks, the participants were debriefed and asked not to bias future participants by discussing anything that they had done in the session.

Affect Measure

The same scoring procedure was carried out in this study as in the previous two studies. Each participant's score on the affect measure consisted of the difference between the sum of all the positive emotional word ratings and the negative emotional word ratings.

Results

Reliability Analysis and Manipulation Check

Reliabilities were calculated for positive affect (PA) scores and negative affect (NA) scores. For the 15 positive terms comprising the PA score alpha = .91 and for the 15 negative affect terms comprising the NA score alpha = .93. The correlation between the PA and the NA scores was $r = -.27$, $p < .01$. Once again significance of the negative correlation supports the assumption of affect bipolarity.

The manipulation check consisted of two questions included in the follow-up

questionnaire presented after the vignettes. The first asked the participants to rate their perception of their described spouse at the beginning of the story, and the second asked for a rating of the perception of gain or loss in the resources of the spouse as a result of the events described. A 7-point scale accompanied both questions. Cell means for both questions are presented in Table 3.1 and Table 3.2, respectively.

For the first question the accompanying scale was -3 "very un-successful or physically attractive" (depending on the condition), -2 "unsuccessful/physically attractive", -1 "slightly below average", 0 "average", +1 "slightly above average" and so on. For all conditions and all subjects the mean ratings of their perception of their spouse described at the beginning of the story were above "average" (Table 3.1). There were no significant effects of sex of subject, $F_{(1,311)} = 2.4$, $p > .05$, sex of experimenter, $F_{(1,311)} = .27$, $p > .05$, or resource (status/physical attractiveness), $F_{(1,311)} = 1.1$, $p > .05$. However, a significant main effect of gain/loss was found, $F_{(1,311)} = 24.76$, $p < .001$. Participants in the conditions that described their spouse as loosing either status or physical attractiveness, perceived their described spouse as more above average than the participants in the conditions that described their spouse as gaining in status or physical attractiveness. Because this question was asked after the participants finished reading the vignettes, perhaps it is not surprising that, in retrospect, losses are exaggerated compared to gains.

For the second question the accompanying scale was –3 "dramatic decrease", -2 "decrease, -1 "slight decrease", 0 "not at all", +1 "slight increase", etc. For all conditions the participants' mean ratings of their perceptions of the gains or losses of their spouses' resources were in the appropriate directions (Table 3.2).

Table 3.1

Mean ratings of perception of spouse at the beginning of the scenarios.
(First number in each cell's row is from the Male Experimenter sessions and the second number is from the Female Experimenter sessions.)

a.) Status Conditions:

	Gain	Loss
Males	+1.09/+.89 N=23/19 SD=1.0/.66	+1.67/+1.48 N=21/21 SD=.66/1.6
Females	+1.21/+1.7 N=19/20 SD=1.36/.66	+1.79/+1.2 N=21/20 SD=1.3/1.28

b.) Physical Attractiveness Conditions:

	Gain	Loss
Males	+.60/+1.38 N=20/21 SD=1.31/.97	+2.57/+1.6 N=21/20 SD=.51/1.6
Females	+.25/+.52 N=20/23 SD=1.41/1.2	+1.56/+1.35 N=18/20 SD=1.42/2.1

Table 3.2

Mean ratings of perception of changes in spouse's resources as a result of the events described in the scenarios.
(First number in each cell's row is from the Male Experimenter sessions and the second number is from the Female Experimenter sessions.)

a.) Status Conditions:

	Gain	Loss
Males	+1.83/+2.53 N=23/19 SD=1.11/.77	-1.81/-2.19 N=21/21 SD=.75/.51
Females	+2.37/+2.95 N=19/20 SD=.68/.32	-1.95/-1.45 N=21/20 SD=1.28/1.39

b.) Physical Attractiveness Conditions:

	Gain	Loss
Males	+1.9/+1.67 N=20/21 SD=.79/.58	-1.52/-1.45 N=21/20 SD=.98/.76
Females	+1.6/+1.52 N=20/23 SD=.94/.51	-1.5/-.5 N=18/20 SD=1.15/.76

As expected, a large significant effect for gain / loss, $F_{(1,311)} = 1370.2$, $p < .001$, and no significant effect of type of resource, $F_{(1,311)} = .51$, $p > .05$, was found, with all subjects correctly assessing gains or losses in their spouses' described resources, regardless of the particular resource described in the vignettes. However, a significant main effect for sex of subjects was found, $F_{(1,311)} = 7.27$, $p < .01$, as well as sex of experimenter, $F_{(1,311)} = 7.78$, $p < .01$. The 2 (male/female experimenter) x 2 (male/female subjects) interaction, $F_{(1,311)} = 5.7$, $p < .05$. These results indicate that the female participants expressed a more polarized perception of their described spouses' change in resources in the experimental sessions conducted by the female experimenter. These results tentatively support the previously mentioned reasoning that the presence of same-sex experimenter acts as a salience cue to intra-sexual competition and relative standing among peers. However, the lack of similar findings for the male participants in the presence of the male experimenter begs caution in asserting such an interpretation too forcefully.

Primary Data Analysis

Cell means data for the entire sample is presented in Table 3.3. An overall 2 (sex of subject) x 2 (sex of participant) x 2 (status/physical attractiveness) x 2 (gain/loss) analysis of variance produced no significant main effects for sex of experimenter, $F_{(1,311)} = 2.51$, $p = .11$, and no significant main effects for sex of subjects, $F_{(1,311)} = .01$, $p = .91$. The former revealing of negligible effects of the sex of experimenter, and the latter supporting the *a priori* hypothesis (and replicating previous findings) that male and female participant do not, significantly, differ from each in terms of emotionality or willingness to report it.

Table 3.3

Mean Affect Balance scores for male and female participants in each of the four conditions in the presence of male and female experimenters:

a.) Experimenter: Male

Status (of spouse):

	Gain	Loss
Male Ss.	12.00 N=23 SD=20.79	22.95 N=21 SD=23.81
Female Ss.	42.37 N=19 SD=11.92	8.33 N=21 SD=25.32

Physical Attractiveness (of spouse):

	Gain	Loss
Male Ss.	55.75 N=20 SD=9.86	-.24 N=21 SD=13.59
Female Ss	26.45 N=20 SD=17.72	19.28 N=18 SD=26.13

b.) Experimenter: Female

Status (of spouse):

	Gain	Loss
Male Ss.	14.00 N=19 SD=14.79	21.05 N=21 SD=16.74
Female Ss.	58.4 N=20 SD=11.36	-3.95 N=20 SD=29.12

Physical Attractiveness (of spouse):

	Gain	Loss
Male Ss.	49.24 N=21 SD=10.8	9.20 N=20 SD=12.89
Female Ss	28.91 N=23 SD=18.26	18.90 N=20 SD=12.58

Once again, not surprisingly, there was a main effect for gain/loss of resource, with $F_{(1,311)} = 166.87$, $p<.001$, with all subjects having a more positive emotional response to gains rather than losses of their spouses' resources, regardless of whether those gains or losses were in status or physical attractiveness.

In addition, as may be seen from the table of means (Table 3.4) contrary to the a priori hypothesis there was a significant main effect of the type of resource (status or physical attractiveness), $F_{(1,311)} = 9.24$, $p < .01$. The mean values for the gains and losses of physical attractiveness were higher than comparable values for status. It was hypothesized that, as resources, status and physical attractiveness were comparable resources for the two genders, however, a significant main effect implied otherwise, although the effect size is small, $d = .13$. Possible interpretation for these results will be discussed in the following section.

A significant 3-way interaction, sex of subject by type of resource by gain/loss, was found, $F_{(1,311)}=69.5$ and $p<.001$ (cell means Table 3.5, graph Figure 3.1). These results revealed that not only did male and female subjects respond differently to status and physical attractiveness, but also that within these resources, the gains and losses likewise, elicited different responses from the genders. That is, male participants responded with a more intense appropriate reaction to the gains and losses of physical attractiveness of their spouses and female participants responded with a more intense appropriate reaction to the gains and losses of status of their spouses.

Table 3.4

Mean Affect Balance scores:

Significant 2 (type of resource) x 2 (gain/loss) interaction.

	Status	Physical Attract.
Gain	31.05 N=81 SD=24.83	39.80 N=84 SD=19.24
Loss	8.07 N=83 SD=27.63	11.44 N=79 SD=18.48

Table 3.5

Mean Affect Balance scores:

2 (sex of subject) x 2 (status/physical attractiveness) x 2 (gain/loss) interaction.

a.) Status (of spouse):

	Gain	Loss
Male Ss.	12.90 N=42 SD=17.86	22.00 N=42 SD=20.35
Female Ss	50.59 N=39 SD=14.06	-6.20 N=41 SD=26.99

b.) Physical Attractiveness (of spouse):

	Gain	Loss
Male Ss.	52.41 N=41 SD=10.74	4.37 N=41 SD=13.93
Female Ss	27.77 N=43 SD=17.84	19.08 N=38 SD=19.87

Figure 3.1

Mean Affect Balance scores:

Significant 3-way interaction, 2 (sex of subject) x 2 (type of resource) x 2 (gain/loss).

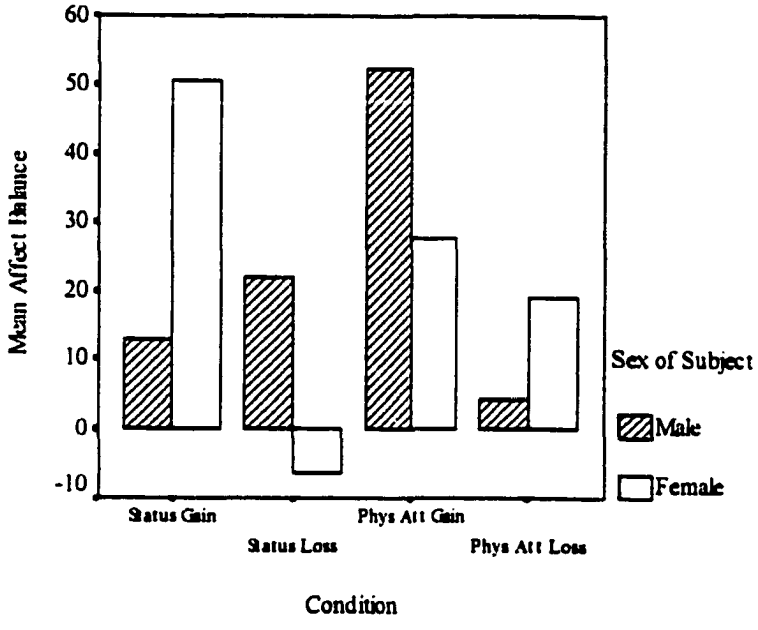
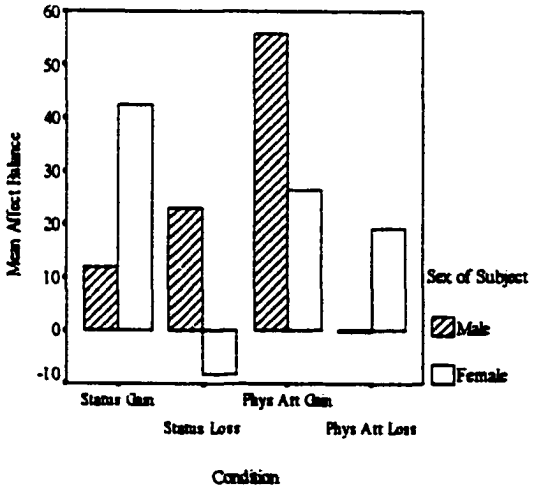


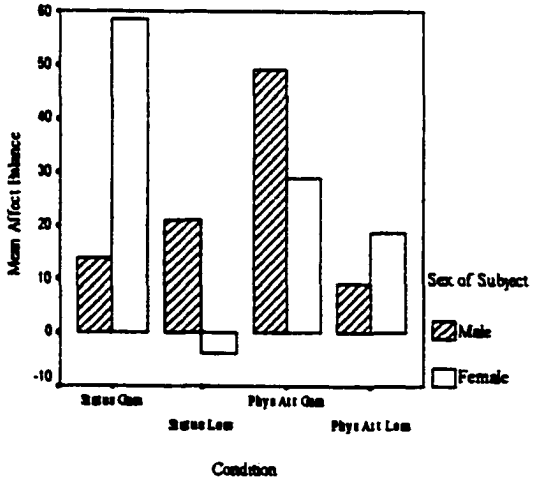
Figure 3.2

Mean Affect Balance scores for the entire study.

a.) Experimenter: Male



b.) Experimenter: Female



Planned Comparisons: 2-way Interactions and Simple Effects

The specific hypotheses for this study were: a) Situations that increase or decrease the physical attractiveness of a spouse will elicit a more intense emotional response from the male than the female subjects, and b) situations that increase or decrease status of a spouse will elicit a more intense emotional response from the female than the male subjects. Data for cell means presented in Table 3.3 are represented in graph form in Figures 3.2a and 3.2b.

As can be seen from the pattern in these tables and graphs, there were no significant differences between the participants' responses in the sessions conducted by the male and female experimenters, $F_{(1,311)} = 2.51$, $p > .05$, therefore, the data will be presented collapsed across this variable. The hypotheses regarding the experimenter effects, although not as precisely formulated as the rest, seem to indicate (albeit without statistical significance) that the presence of the experimenter intensified the emotional responses of the same-sex participants. The reasoning, offered in the introduction to this study, related the increased intensity of emotional response to the possibility of experimenter serving as a salience cue to intra-sexual competition. In other words, the changes in the resources of the imagined spouse were, theoretically, evaluated in light of the way the spouse makes the subject evaluate themselves with regard to their same-sex competitors. That is, male subjects responded with more positive emotional reactions in the presence of a male experimenter (competitor) in the conditions of wives' increase in physical attractiveness. Female subjects responded with more positive emotion in the presence of a female experimenter (competitor) in the conditions of husbands' increase in status.

Physical Attractiveness Conditions. The 2-way interaction (male/female x gain/loss) was significant with $F_{(1,311)}=47.59$, $p < .001$. These results are presented in Table 3.5b and in graph form in the right half of Figure 3.1 and support the first *a priori* hypothesis for this study. That is, males were significantly more responsive than females to the gains and losses of physical attractiveness in their spouse. The responses of the male participants were significantly more negative in the 'loss' condition than the female responses, $F_{(1,311)}= 12.90$, $p<.001$, $d = .43$ and significantly more positive in the 'gain' condition than the female responses, $F_{(1,311)}=38.52$, $p < .001$, $d = .86$.

Status Conditions. The 2-way interaction of sex of subject by gain/loss was significant with $F_{(1,311)}=134.41$, $p < .001$. These results are presented in Table 3.5a and in the left half of Figure 3.1 and support the second hypothesis for this study, namely that female responses were significantly more intense than the male responses to the gains and losses of status in their spouse. A significant difference was found between the 'status-gain' groups, with females reporting a more intense positive emotional response than the males, $F_{(1,311)}=86.85$, $p < .001$, effect size, $d=1.1$. As well, a significant difference between the 'status-loss' groups showed females responding more negatively than the males, $F_{(1,311)}=49.88$, $p < .001$, and $d = .59$.

Characteristics of Sample Group and Secondary Analysis

In addition to the dependent measure, four other questionnaires were included in this study, the visualization experiment evaluation questionnaire, a modified socio-sexuality scale (Gangestad & Simpson, 1990), a general background questionnaire, and a two-part experimenter evaluation questionnaire. Summary results for each are presented in turn. The complete questionnaires are included in Appendix B.

Experiment Evaluation Questionnaire. Some of the resulting statistical analyses of the items on this questionnaire are summarized in Table 3.7. Each item was evaluated with respect to its effects on the Affects Balance scores of the participants.

Question #1 asked for a 'yes or no' answer. Of the total number of subjects in this study, 33% (53 females, 55 males) answered 'yes' to this question of whether a situation similar to the one described in the scenario ever happened to them or someone they know in real life. As can be seen from the table, there was no significant main effect on the affect responses that may be associated with the answers to this question.

The responses to question #2 which asked how successfully they were able to visualize themselves living in the described fictional culture, the responses were on a scale of 1 to 5, with 1 being "not at all" and 5 being "very successful". There were no significant differences between the participants' Affect Balance scores based on their answers to this question, and no significant interactions with other variables in the study.

In response to question #3 which asked how successful they were at imagining the social custom of arranged marriage the participants' answers showed a significant effect on their Affect Balance scores, $F_{(4,294)} = 5.0$, $p<.01$. A significant 2-way interaction between the responses to this question and type of resource, $F_{(4,294)} = 3.9$, $p<.01$, was also found. As well, the interaction between the answers to this question and gain / loss was also significant, $F_{(4,292)} = 2.9$, $p<.05$. Figure 3.3 presents these results in graph form.

Table 3.6

Main effects and selected interactions of each Experiment #1 Evaluation Questionnaire items with the participants' Affect Balance scores.

	Main Effect		2-way Interaction w/ Sex of Ss		2-way Interaction w/ Type of Resource		2-way Interaction w/ Gain/Loss		3-way Interaction w/ Sex Ss & Resource	
	F	p	F	p	F	p	F	p	F	p
Que.#1	.01	>.05	.06	>.05	1.1	>.05	6.7	<.01**	.09	>.05
Que.#2	.52	>.05	1.0	>.05	2.7	>.05	.43	>.05	1.48	>.05
Que.#3	5.0	<.01**	2.6	>.05	3.9	<.01**	2.9	<.05*	1.03	>.05
Que.#4	9.3	<.01**	5.4	<.05*	.25	>.05	.79	>.05	5.6	<.05*
Que.#5	2.3	<.05*	1.9	>.05	2.9	<.01**	.58	>.05	1.1	>.05
Que.#6	1.0	>.05	.95	>.05	1.9	>.05	1.8	>.05	.96	>.05
Que.#7	3.4	<.01**	3.9	<.01**	.49	>.05	1.7	>.05	1.2	>.05
Que.#8	2.7	<.05*	2.8	<.05*	1.3	>.05	2.5	<.05*	2.9	<.05*
Que.#9	.76	>.05	.85	>.05	.11	>.05	2.6	<.05*	1.7	>.05

* significant at .05 level ** significant at .01 level

Que. #1Has anything similar ever happen to you or someone you know?

Que.#2 How successful were you at imagining living in the culture described?

Que.#3 How successful were you at imagining what arranged marriage would be like?

Que.#4 Did the idea of divorce enter your mind?

Que.#5 Divorce is not something to be ashamed of.

Que.#6 There is no difference between men & women professionally.

Que.#7 Most spouses are unfaithful.

Que.#8 People are most likely to be unfaithful if others show romantic interest in them.

Que.#9 Divorce is not the answer.

Figure 3.3

Success of imagining the experience of arranged marriage custom and its effects on affect scores of participants.

a.) Status (of spouse):

b.) Physical Attractiveness (of spouse):

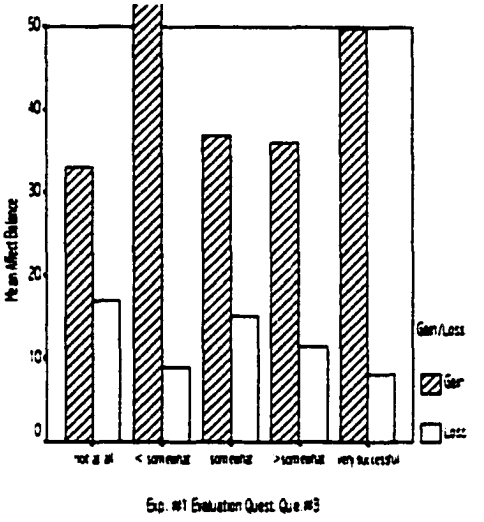
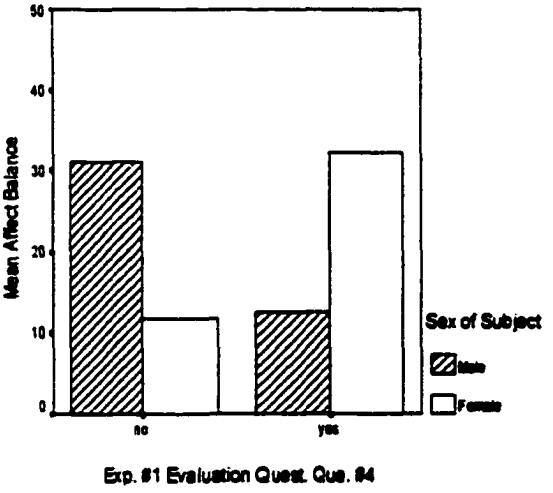


Figure 3.4

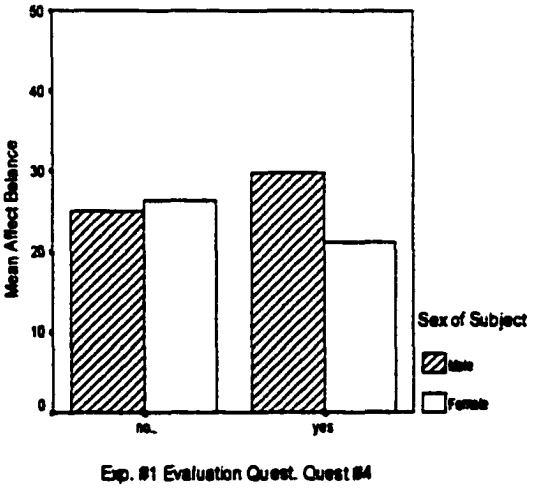
The effects of thoughts of divorce on affect scores.

a.) Status (of spouse):



Exp. #1 Evaluation Quest. Que. #4

b.) Physical Attractiveness (of spouse):



Exp. #1 Evaluation Quest. Quest #4

As can be seen from the figure 3.3b. 'Physical Attractiveness' graph, with increase in the success of the visualization, the affect responses tended to polarize. That is, as may be expected, in the 'gains' conditions the responses became more positive with increased success of visualization, and in the 'loss' conditions the responses became more negative with increased success of visualization. The interaction between the responses to this question and gender of the participants was non-significant, $F_{(3,294)} = 2.6$, $p > .05$.

In response to question #4 of whether thoughts of divorce entered their minds, regardless of the fact that the story described 'no possibility of divorce', 40% subjects (47 males, 82 females) answered 'no'. For 60% subjects (119 males, 79 females), thoughts of divorce were experienced. The responses to this question did have a significant effect on Affect Balance scores of participants in this study, $F_{(1,311)} = 9.34$, $p < .01$, as well as a significant interaction with sex of subjects and resource, $F_{(1,311)} = 5.6$, $p < .05$. Figure 3.4 presents these results in graph form. From the graph it can be seen that when the scenarios involved changes in the spouses' status, female participants had more positive affective responses if they had thoughts of divorce than if they had not. Or from the opposite perspective, female participants had more negative affective responses if they did not have thoughts of divorce than if they had. The reverse was true for the male participants. When the scenarios involved changes in the spouses' physical attractiveness, male participants had more positive emotional responses if they had thought of divorce than if they had not, or more negative emotional responses if they did not have thoughts of divorce than if they had. The reverse was true for the female participants. These results support the reasoning that the awareness of a possibility to end a relationship increases the insensitivity to the partner's situation. This reasoning is based on the assumption that

it is more 'normal' to experience a baseline positive affective state than a negative one (which is associated with clinical conditions of dysthymia and depression) (Nesse, 1989).

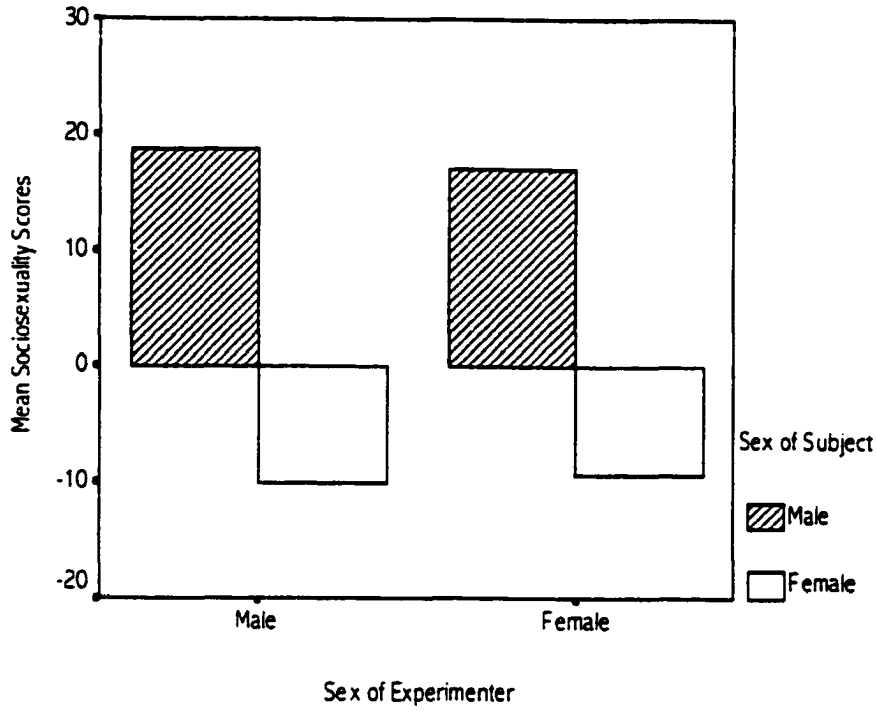
The responses to question #5 through #9 asked the participants the degree to which they agreed with statements regarding divorce and professional equality between men and women. Although various significant effects and interactions were found (see Table 3.7), no discernable or systematic pattern of responses could be determined or interpreted.

Socio-sexuality Scale. A single sociosexuality score for each subject was calculated from all the items on this questionnaire (developed by Gangestad and Simpson, 1989b, as cited in Gangestad & Simpson, 1990). Participants with larger scores represent those who possess 'unrestricted sociosexuality', defined by Gangestad and Simpson (1990) as "people who require relatively less time with and weaker attachment to their partners before engaging in sex with them" (p. 71). Participants with lower scores represent those who possess 'restricted sociosexuality', defined as "those who require relatively more time and stronger attachment to, commitment to, and closeness with their romantic partners before they are willing to enter asexual relationship with them." (p.71).

Large gender differences between the male and female participants were found on this scale. Male participants' sociosexuality scores were significantly higher than female participants' sociosexuality scores, $F_{(1,311)} = 124.33$, $p < .001$ (Figure 3.5). The responses on the dependent measure of Affect Balance associated with male and female sociosexuality scores evidenced no systematic effects associated with these scores and the participants' Affect Balance scores, $F_{(24,311)} = 1.56$, $p > .05$.

Figure 3.5

Mean values for male and female participants' responses on Socio-sexuality scale.



General Background Information. This questionnaire included questions about place of birth, religion, academic status, employment, etc. Because of the nature of the study and the need for reading comprehension, it was important to note the number of participants for who English was not a native language. Of the total number of subjects, a little over one third (122, 60 male and 62 female) were non-native English speakers. Their scores, however, paralleled the scores of native English speakers (see Figure 3.6). Likewise, religiosity was seen as a characteristic that might have an effect on participants' responses via its effect on beliefs about relationships. However, as can be seen from Figure 3.7, only the participants who rated themselves as 'very' religious showed more intense responses to the 'status of spouse' conditions only.

No other markedly discernible individual characteristics were found that systematically effected the participants' affect responses.

Experimenter Evaluation Questionnaire. This questionnaire was included as an attempt at assessment of the participants' perceptions of the experimenters. From the results of studies 1 and 2, it was apparent that the male experimenter's status and the female experimenter's physical appearance had an effect on the participants' responses. However, directly asking the question 'How attractive did you find your experimenter?' would not have been likely to gain a truthful response. For that reason this questionnaire was presented as a separate task, and not handed out to the participants as part of their experimental booklets. It was introduced as a current survey of the American Psychological Association regarding conduct and professionalism of experimenters.

Part I of this questionnaire contained five questions that dealt with the "Professional Conduct and Demeanor" of the experimenter. A 7-point Likert scale

Figure 3.6

Mean Affect Balance scores for native English and non-native English speakers.

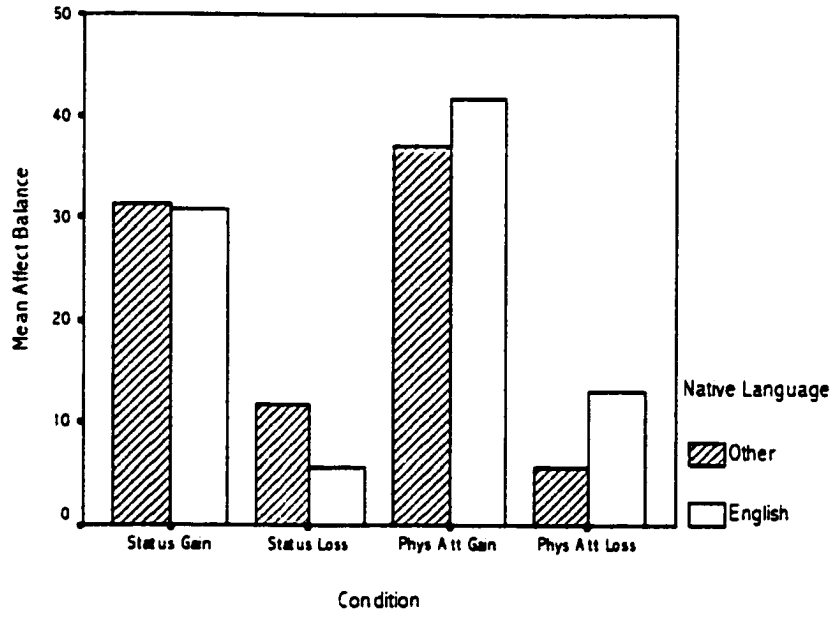
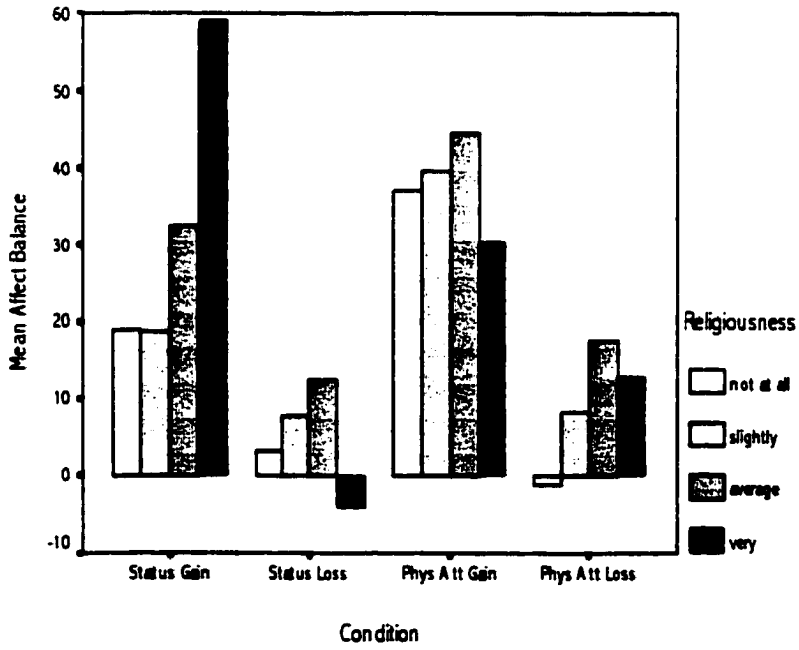


Figure 3.7

Mean Affect Balance scores by levels of reported religiosity.



accompanied each question. All participants completed this part of the questionnaire. It was designed to assess the participants' perceptions of the experimenters' "status".

Part II contained four questions that dealt with "Gender-Related Issues". Only participants of the opposite sex from the experimenter completed this part. It was designed to assess perceptions of the experimenters' "physical attractiveness".

Results from Part I are presented in Figures 3.8 and 3.9. Each participant's score was calculated by adding questions #1, #2, and #3, which were stated in positive terms (i.e.: 'the experimenter was helpful', '...was polite') and subtracting from the sum questions #4 and #5 which were stated in negative terms (i.e.: 'The experimenter seemed authoritative...'). Higher values on this questionnaire represented more positive perceptions of the experimenter and lower numbers represented more negative perceptions. There were no significant differences between the rating of the male and female participants, $F_{(1,311)} = .001$, $p>.05$, however, there was a significant difference in the participants' scores on this questionnaire in the ratings of the male and female experimenters, $F_{(1,311)}=4.5$, $p<.05$ (Figure 3.8). Also a significant 3-way interaction, sex of experimenter by sex of subject by gain/loss, was found, $F_{(1,311)}= 7.9$, $p<.01$ (Figure 3.9). Such that in the 'loss' conditions (status and physical attractiveness) the female experimenter's status was perceived as being relatively low and the man's relatively high. In the 'physical attractiveness-gain' condition, the female experimenter's status was perceived as relatively high. There was no difference between the male and female experimenters perceived status in the 'status-gain' condition.

Figure 3.8

Mean participants' scores on Experimenter Evaluation Questionnaire Part I.

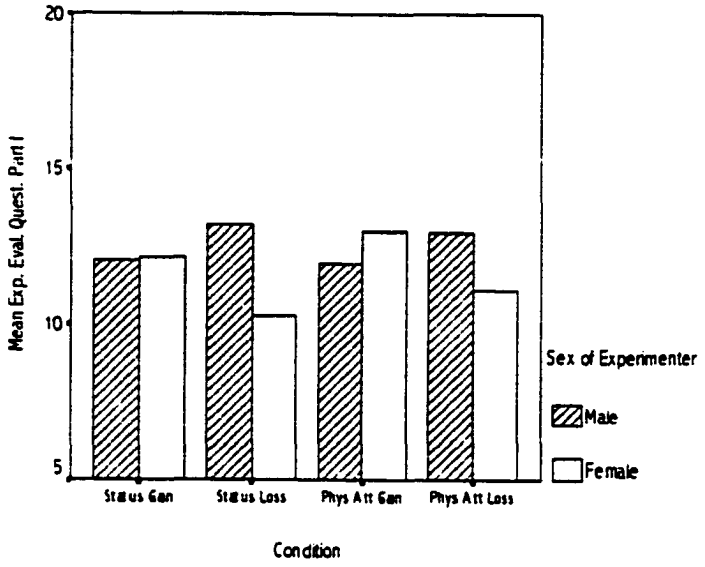
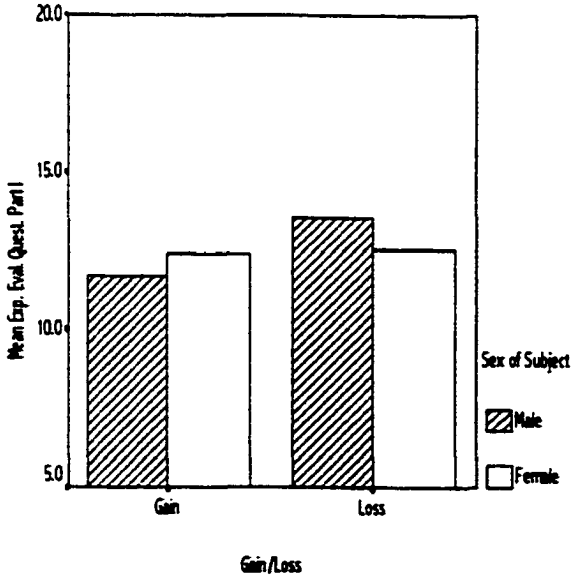


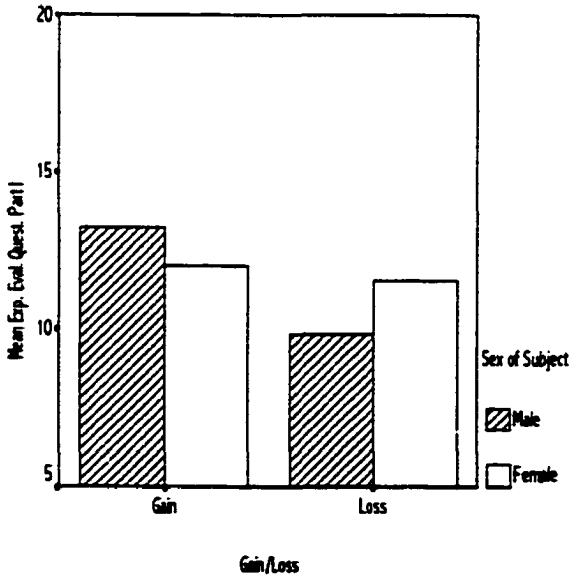
Figure 3.9

Mean participants' scores on Experimenter Evaluation Questionnaire Part I for male and female experimenters.

a.) Experimenter: Male



b.) Experimenter: Female



A weak positive correlation between the questionnaire scores and the affect scores was also found, $r = +.12$, $p < .05$, indicating a tendency for more positive emotional experiences to be associated with positive experimenter evaluations. Forgas and Moylan (1987) have reported similar findings. They showed that participants judgments of political figures, perceptions of events, and assessments of crime rates were all influenced by immediate emotional experiences, such that participants experiencing a positive mood tended to make more positive judgments, and vice versa.

Three of the four questions in Part II of this questionnaire, directly asked the participants to rate how attractive they found the experimenter, and how likely they would be to date the experimenter. A sum of these three values generated a single score, with higher numbers being interpreted as perceptions of greater physical attractiveness. A large difference between the male and female participants was found in the scores on this part of the questionnaire, $F_{(1,152)} = 115.34$, $p < .001$. The mean value for the male participants was 12.2 and mean for female participants was 7.7. (Because only the male participants were rating the female experimenter and only the female participants were rating the male experimenter, there were no interactions of sex of subject by sex of experimenter.) However, there was no relationship between the affect scores and the scores on this questionnaire, $r = -.04$, $p > .05$.

The fourth question asked the participants if they would be flattered or offended if the experimenter showed romantic interest in them, 40 females responded that they would be offended, 38 said they would be flattered. Of the male participants, 80 responded that they would be flattered, 1 said he would be offended. Once again, even though these data showed such large gender differences on this question, there were no

significant effects on the participants' affect scores, $F_{(1,152)} = .89$, $p > .05$.

Discussion

The results of this study supported the experimental hypotheses, lent further support to the efficacy of the methodology and the underlying assumptions of evolutionary theory. The hypotheses of gender differences in emotional sensitivity to the gains and losses of spouses' resources were powerfully supported. Results showed greater emotional sensitivity of males than females to the changes in their wives' physical attractiveness and greater emotional sensitivity of females than males to the changes in their husbands' status.

Gender of experimenter, however powerful the effects in studies 1 and 2 did not have comparably powerful effects in this study, nor were these effects expected to be so when considered in the appropriate context. As mentioned previously, the first two studies dealt specifically with personal resources and immediate contextual cues. In this study personal resources were indirectly affected via the changes in the 'spouse's' resources. Therefore, in this study, more cognitive steps would be necessary to arrive at an experience similar to the previous studies. That is, in studies 1 and 2 when the participants imagined the scenario, they were imagining the described events happening to themselves. In this study, when the participants imagined the scenario, they were imagining the described events happening to an imaginary person, who they had to first imagine, was their spouse. Therefore, this increased psychological distance between the experimental context and personal significance was expected to decrease the effects of the experimenters (who were part of that experimental context as well).

It was also surprising to see an opposite tendency to the one hypothesized in the

males' responses to the gains and losses of their spouses' status (left half of Fig. 3.1). Although non-significant in statistical analysis, this tendency is, nonetheless, in the opposite direction and may point to future research endeavors that further elaborating the underlying cognitive mechanisms involved. One possible reason for a more positive emotional response from a man to his wife's loss rather than her gain in status, may be due to a link between her loss in social status and an increase in his ability to control her behavior. This increased mate-controllability would increase his access to her and decreasing that of potential other mates, thereby affording him a reproductive advantage.

Furthermore, it was a necessary assumption for this research to treat the resources of status and physical attractiveness as comparably similar in significance and importance for the two genders. The results were otherwise, as revealed by the significant main effect of type of resource and may be seen in comparing the right and left halves of Table 3.4. However statistically significant these results may be, they do not weaken the overall results of this study, because it needs to be remembered that the assumption of comparability may not be completely correct. Obviously, the two resources are different in kind, quality, duration of possession, ease of acquiring, and possibility of reacquiring if lost. Although it maybe acceptable to equate these resources when focusing on personal evaluations (as was done in studies 1 and 2), it may not be appropriate to do so when focusing on the evaluation of these resources in someone else (as was the case in this study). Further research is required in order to be able to properly evaluate this issue and if, in fact, the same resources are evaluated differently depending on whether they are one's own or belong to another.

The attempt to assess the significance of personal beliefs and visualizing abilities'

effects on the dependent measure, done by including the evaluation questionnaire, was less than illuminating. To be sure, it was interesting to note that such a large proportion of participants reported experience thoughts of divorce (60%), even thought they were instructed not to do so. By the same token, it is also important to note that the participants were willing to admit to not following or not being able to follow the instruction, thereby allowing for some degree of an assessment of demand characteristics.

Furthermore, the attempt at an assessment of the participants' perceptions of experimenters attractiveness (more important for the interpretation of studies 1 and 2 than this one) was likewise interesting but not revealing with respect to these perceptions' effects on the dependent measure (Figures 3.10 and 3.11). The perception of male experimenter's status (from Part I of the questionnaire) was high and female experimenter's low in the conditions in which the imagined spouses' status decreased (see Figure 3.9). The female experimenter's perceived status was high and the male experimenter's relatively lower in the conditions in which the imagined spouses' physical attractiveness increased. The participants seemed to be responding to the experimenters in relation to their what they had experienced regarding their imagined spouses, however little this perception may have effected their dependent measure responses.

With respect to how physically attractive the participants found the experimenters to be (from Part II of the questionnaire), the high scores of the male participants responses would have shed more light on the results from study 1 than this one, if the questionnaire was included in that study and showed similar results.

General Discussion

Collectively, these three studies provide empirical support for the importance of

contextual specificity and evolutionary explanations in research dealing with emotion, in general, and gender difference in emotion, in particular.

Gender differences in emotional expression, intensity, and frequency exist (for review see: Saarni, 1993; Brody & Hall, 1993) but gender alone is not the only or even the best predictor. Similarly, social learning models attempt to explain observed gender differences by invoking concepts of differential socialization (i.e.: Lott & Maluso, 1993; Beall, 1993) and gender-specific schema (Eagly & Wood, 1991; Deaux & Major; 1987), but once again, these types of theories would be hard pressed to explain *why* such differences originated in societies in the first place, and why they continue to exist.

Evolutionary theory offers the answers to the same questions by placing the emphasis on the differential adaptations of the two genders to the different survival challenges we faced in our ancestral past and continue to face in our current environments. As well, evolutionary theory provides the opportunity to generate testable hypotheses and the generation of empirical evidence.

Presented research contributes to the application of evolutionary theory to our understanding of gender differences in the intensity of emotional responses. Because gender differences are most readily documented in the domain of mating, the focus of this research was on the resources of status and physical attractiveness. These resources have been found to be significant in the theoretical work of Trivers (1972) and the empirical findings of Buss and his colleagues (i.e.: Buss & Schmitt, 1993).

In study 1 an attempt was made to test gender differences in emotional response to the changes in personal resources of status and physical attractiveness. The hypotheses for this study were: a) greater male emotional sensitivity to the changes in status and b)

greater female emotional sensitivity to the changes in physical attractiveness. Results showed significant differences in emotional response to the changes in status, with male participants reporting a significantly more intense positive response to the gains in status and a more intense negative response to the losses in status, than the female participants. These patterns of responses (male versus female) were also significantly different from each other, thus supporting the hypothesis of gender differences in the emotional responses to the changes in this resource.

For the resource of physical attractiveness, the results were less supportive of the hypothesis. That is, the differences in the responses to the gains and losses of physical attractiveness were significant for the female (but not the male) participants, with greater positive affect reported to the gains in physical attractiveness and greater negative affect reported to the losses in physical attractiveness. However, the pattern of responses (female versus male) were not significantly different from one another, thus only partially supporting the hypothesis of gender differences in emotional response to this resource.

Study 2 was carried out as an attempt to clarify the results from study 1. It was noted that the presence of a female experimenter might have had a differential effect on the male and female participants thus having an uncontrolled differential effect on the male and female responses on the dependent measure. Physical attractiveness conditions only were used in this partial replication of study 1 and a male experimenter was included in order to evaluate possible gender of experimenter effects.

Results from this study replicated the previous study's results for the female experimenter and revealed a significant gender-of-experimenter effect. Female participants in the sessions conducted by the male experimenter reported more intensified

and polarized emotional responses to the same stimulus as was used in the previous study. Gender differences, signified by a difference in the patterns of male and female responses, were significant in the presence of the male experimenter, whereas they were not in the presence of a female experimenter. The results of this study emphasized the importance of contextual cues and situational significance in emotional responsiveness.

The third study was conducted in order to extend the findings of the previous two studies by changing the focus of the experimental manipulation from changes in personal resources to changes in spouse's resources. The hypotheses were complimentary to the previous two studies. That is, now the male participants were expected to experience a greater emotional response to changes in physical attractiveness and the female participants were expected to experience a greater emotional response to changes in status. These changes, however, were now presented as being experienced by the participants' spouses.

Results for this study supported the experimental hypotheses by revealing significant gender differences in the reported emotional responses of male and female participants. Such that, the female participants' responses were significantly more positive to gain of status and more negative to loss of status experienced by their 'husbands'. The male participants' responses were significantly more positive to gain of physical attractiveness and more negative to loss of physical attractiveness experienced by their 'wives'. The patterns of responses, and thus gender differences, were also statistically significant for both resources.

Some of the results in this research are extremely powerful, such as the female participants' responses to the gains and losses in physical attractiveness in the presence of

a male experimenter (study 2). However, many details and variables still remain unclear and unspecified in this set of studies, a fact that urges caution in the interpretation of the findings. For example, further data is needed in order to identify the specific characteristics of the experimenters that had the effects on the subjects' responses. In study 3 including an experimenter evaluation questionnaire made this attempt. However the results (aside from males finding the female experimenter attractive) did not clarify the effects of these perceptions on the dependent measure, especially with respect to the male experimenter.

Furthermore, the dependent measure was in the form of self-report and, as always, the possibility of demand characteristics requires caution in interpreting these results as being free from bias. The fact that such a large number of participants (60%) reported thoughts of divorce in study 3 even though they were instructed not to consider it, is encouraging, but not completely convincing, especially regarding studies 1 and 2. Further data would be required in order to assess the accuracy of self-reports with other measures of affect, such as physiological or neurological changes.

Despite these weaknesses, this line of research and its results fit well into the findings from research in the fields of emotion and evolutionary psychology. The work of Damasio (1994) showed the significance of emotional response in learning and cognition. Mayer and colleagues' research (i.e.: Mayer & Geher, 1996) emphasized the significance of emotion in intelligence and decision-making abilities. And Nesse (1989) focused on the significance of normal emotional responses and the evolutionarily significant causes of clinical disturbances in emotional response. All these sources, including many others (i.e.: Plutchik, 1990; LeDoux, 1996; Lazarus & Lazarus, 1994) emphasize how important

our understanding of emotion and emotional responses is to our understanding of the evolution of our species and our mental abilities.

Future research needs to address various issues, including the specific discrete emotions elicited by the gains and losses of status and physical attractiveness, as well as comparing these responses to the gains and losses of other reproductively-related and non-reproductively related resources. Also, as already mentioned, other emotion components (such as the physiological and behavioral) need to be investigated in order to formulate a more complete understanding of the system of emotions and provide verification of current findings. The presented research was geared toward establishing a foundation for research in this area of study as well as providing preliminary empirical support for the paradigm and methodology, the results of which would provide a fertile ground for continued investigation.

Appendix A

Stimulus for studies 1 & 2:

Initial Verbal Instructions

"The booklets I am about to distribute to you consist of several different short tasks, including questionnaires, surveys, and a visualization experiment. Because the tasks are different, it is important that you complete each page in order, and do not flip ahead or turn back to material you have already completed.

For the visualization experiment you will be asked to read a short story, imagining the described events happening to you, and then you will be asked several questions regarding how well you were able to do this. This experiment is similar to what athletes and performers do when they visualize themselves going through the motions as a part of practice. This is useful because our brain does not know the difference between real and imagined events, so it is very important that you do your best to visualize the events described with as much detail as possible; try to hear, feel and smell the details. Connect with the story on both the intellectual and the emotional levels.

If you have any questions feel free to raise your hand and ask."

Stimulus Booklets

Page 1. 'VISUALIZATION EXPERIMENT'

In this experiment we will ask you to visualize real and imagined future life events in an attempt to discover the processes that people engage in as they imagine scenarios in which they are supposed to be the actor. That is, how does one ***see*** events as they happen in the mind.

Page 2. Relationship Prime:

The following is an exercise designed to help you think of your long-term goals and plans. Please take a few minutes to answer all the questions. Make sure you read all the instructions and complete all the exercises before going on to the next page.

You are in college right now and studying for classes, fulfilling requirements, and graduating may be important to you. Take a few minutes to think about the things that will become important to you, which may not be right now, once you graduate. Think about how our priorities change throughout our lives and how different things become important at different stages of our lives. Your answers can be as general or as specific as you like.

1. What kind of a position do you hope to get once you finish your education?

_____

_____

2. What relationships will become important to you?

_____

_____

3. Do you see yourself getting married and having a family?

4. What kind of qualities will you look for in the person whom you marry?

5. What kind of qualities or characteristics do you think individuals of your sex look for in the opposite sex?

6. What qualities or characteristics do you think individuals of the opposite sex look for in the people they choose for their spouses?

7. What kind of a relationship do you hope to have with your husband or wife?

8. What things and/or qualities do you think will be very important to possess in order to have the kind of a relationship you want with your spouse?

9. What things and/or qualities do you think people of the same sex as you will think are very important to possess in order to have a successful relationship with their spouse?

10. What things and/or qualities do you think individuals of the opposite sex will think are very important to possess in order to have a successful relationship with their spouse?

Now that you have projected yourself into your future and given some thought as to how you want it to be and how it will be different from the way it is in the present, keep this mental focus on the future as you evaluate the following scenarios. You may turn the page now.

Page 3. 'As you read the following passage try to vividly imagine what is being described. Make the described experience your own, with all its sights and sounds. Focus on how it would *feel* if the events were truly happening to you. Do your best to connect with the story on both the intellectual and emotional levels.'

Page 4. Each participant received a booklet which contained one of the following four scenarios.

Physical Attractiveness Loss:

As far back as you can remember, you were never concerned about your nose, it was perfectly straight and normal and you never thought twice about it. You have friends who have had 'nose jobs', your friend Mike from school and your friend Allison from work. You remember how they used to tell you how lucky you were that you had such a

perfect nose and you would just smile and shrug because you never understood what the big deal was.

Now you understand. You remember waking up in the hospital room with bandages on your face and your doctor telling you that your nose was broken in an accident. He told you that he did the best he could when he set it, but from the tone of his voice and the look on his face, you knew that 'the best' was probably not all that great.

You remember the day they took off the bandages and the first time you looked at yourself in the mirror. Your doctor was standing next to you and he put his hand on your shoulder as you stared into the mirror. Your nose was no longer perfectly straight, it was crooked. You looked up at your doctor for an explanation,

"We did the best we could," your doctor repeated, "the best plastic surgeon in the country is on the staff at this hospital and he was assisting me during the setting of you nose. I'm afraid that, even though the swelling will go down, the slight deformation will be permanent."

'Permanent', that word was not something you wanted to hear, but it's something you have to live with. You remember the first time your friends saw you after the accident,

"What happened to...you?" they asked.

But you knew what they meant, they meant 'what happened to your nose?' You knew that they noticed the imperfection and felt like everyone noticed and everyone wanted to ask the same question: 'What happened to your nose?'

Your nose, something you never thought about before, has become something that you are constantly aware of now. You find yourself looking in the mirror more often now, and wondering if this is how it is going to be for the rest of your life. Permanent.

Physical Attractiveness Gain:

As far back as you can remember, you were always concerned about your nose, it was not straight and normal looking, it was slightly crooked and you were always self-conscious of it. You have friends with perfect noses, your friend Mike from school and your friend Allison from work. You remember telling them how lucky they were that they had such perfect noses, but they would just smile and shrug. You always thought that their unwillingness to talk about it meant that they felt sorry for you and did not want to embarrass you.

Now you understand. You remember waking up in the hospital room with bandages on your face and your doctor telling you that your nose was broken in an accident. He told you that he did the best he could when he set it, and from the tone of his voice and the smile on his face, you knew that 'the best' was probably better than expected.

You remember the day they took off the bandages and the first time you looked at yourself in the mirror. Your doctor was standing next to you and he put his hand on your shoulder as you stare into the mirror. Your nose was no longer crooked, it was perfectly straight. You looked up at your doctor for an explanation,

"We did the best we could," your doctor repeated with a well-deserved smile of self-satisfaction, "the best plastic surgeon in the country is on the staff at this hospital and he was assisting me during the setting of your nose. The swelling will go down. The slight natural deformity is permanently corrected."

'Permanently corrected', those were not the words you were expecting to hear, but it's something you could definitely live with. You remember the first time your friends saw you after the accident,

"What happened to...you?" they asked.

But you knew what they meant, they meant 'what happened to your nose?' You knew that they noticed the change, but this time you did not interpret their unwillingness to talk about it as them feeling sorry for you or not wanting to embarrass you.

Your nose, something that you were constantly concerned with before, has become something that no longer makes you self-conscious. You find yourself looking in the mirror now and remembering how much time you spent worrying about spending the rest of your life with your 'natural deformity', you no longer have to think about that, it's been permanently corrected.

Status Loss:

You have been working in the same company for several years now. You remember when the company first created a new department and you, along with four other people were hired as assistant managers, to fill the newly created positions . You have worked very hard and felt that you got along well your colleges, superiors, and your subordinates. There has never been a complaint about you and you have never had a complaint about anyone else.

As the new department grew in efficiency, you noticed that the people around you began to receive promotions. Soon after, Nancy, Jim, Tina, and George were all promoted. They were the four who were hired the same time you were, and at the same level. You were expecting to get promoted along with them, but you never were.

Although your position and duties remained the same, you began to notice a difference in the way people were treating you. No one was rude or inappropriate with you, but whereas before your subordinates would hold doors open for you and other assistant managers, they no longer did that for you, but continued to do so for Nancy, Jim, Tina, and George. You found yourself getting your own coffee in the morning, more often than not, whereas before someone always made sure your coffee was waiting for you at your desk in the morning.

Before others were promoted, you always felt encouraged by your superiors to express your opinions and ideas, you were always asked for your input and points of view. Now, even though you are still asked for your opinion, albeit with less frequency than before, you do not feel like it carries as much importance for them, as it had in the past.

Your co-workers and colleges now inform you what the managerial meetings were about, whereas before there was never a meeting at which your presence was not required.

Your productivity and efficiency has not changed in all this time, and from what you understand, there are no personal reasons for your continued occupation of your present position. But although personally you do not feel disrespected by anyone, professionally you feel a loss.

Status Gain:

You have been working in the same company for several years now.

You remember when the company first created a new department and you, along with four other people were hired as assistant managers, to fill the newly created positions. You have worked very hard and felt that you got along well your colleges, superiors, and your subordinates. There has never been a complaint about you and you have never had a complaint about anyone else.

As the new department grew in efficiency, you noticed that the people around you began to get demoted. Soon after, Nancy, Jim, Tina, and George were all demoted. They were the four who were hired the same time you were, and at the same level. You were expecting to get demoted along with them, but you never were.

Although your position and duties remained the same, you began to notice a difference in the way people were treating you. No one was overly nice, or inappropriate with you, but whereas before your subordinates would hold doors open for you as often as not, now they always did. You had always made your own coffee in the mornings, now someone always made sure your coffee was waiting for you at your desk in the morning.

Before others were demoted, your superiors sometimes asked for your ideas and input, but you never felt as though your ideas carried very much importance for them. Now, you always feel encouraged by your superiors and colleagues to express your opinions, you are always asked for your point of view, and you feel that what you say is seriously considered and appreciated.

In the past your co-workers and colleagues used to inform you what the managerial meeting, that you were not required to attend, were about. Now there is never a meeting at which your presence is not required.

Your productivity and efficiency has not changed in all this time, and from what you understand, there are no personal reasons for your continued occupation of your present position. But although personally you do not feel any more or less popular, professionally you feel a gain.

Page 5. Each booklet contained one of the following, depending on the condition.

Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question, please circle all the choices which most closely describe what you experienced when you were visualizing the previous passage. Please take your time and answer as accurately as you can, and remember: there are no wrong answers.

1. How did you know the doctor was disappointed with the outcome?
   a) the sympathetic tone of his voice
   b) his nervous facial expression
   c) his apparent refusal to meet my eyes

2. The first time you looked into the mirror after surgery, what did you notice?
   a) how different my face looks now
   b) how unattractive I look now
   c) how sad and 'teary-eye' I look
   d) I noticed nothing *but* my crooked nose

3. What was your reaction to the word 'permanent'?
   a) I was shocked
   b) I was angry
   c) I was depressed
   d) I was sad

4. How did you experience the above reaction (in question 3)?
   a) I felt like crying
   b) I felt like hitting someone/something
   c) I felt like pulling the covers over your head
   d) I felt like being alone

5. How did you know your friends were referring to your nose when they were inquiring about your well being?
   a) because they had disgusted looks on their faces
   b) it was the way they said it (tone of voice, mannerism, etc.)
   c) because they, obviously, avoided looking at my nose
   d) because I could hear the pity in their voices

6. How do you know that your crooked nose has effected your self-image?
   a) I avoid looking in mirrors now
   b) I avoid eye contact with other now
   c) I are more reluctant to socialize now
   d) I notice noses more often now and find myself comparing my nose to others'

7. Based on what you are feeling as you experience the above described scenario, rate how much you feel your physical attractiveness decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3
(dramatic decrease) (decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question circle **all** the choices which most closely describe what you experienced when you were visualizing the previous passage. Please take your time and answer as accurately as you can, and remember: **there are no wrong answers.**

1. How did you know the doctor was pleased with the outcome?
   a) the excited tone of his voice
   b) his positive facial expression
   c) his enthusiasm about having me see it

2. The first time you looked into the mirror after surgery, what did you notice?
   a) how different my face looks now
   b) how attractive I look now
   c) how happy and excited I look
   d) I noticed nothing *but* my perfect nose

3. What was your reaction to the words 'permanently corrected'?
   a) I was excited
   b) I was happy
   c) I was elated
   d) I was pleased

4. How did you experience the above reaction (in question 3)?
   a) I felt like laughing
   b) I felt like hugging someone
   c) I felt like running outside
   d) I felt like being with other people

5. How did you know your friends were referring to your nose when they were inquiring about your well being?
   a) because they had pleased looks on their faces
   b) it was the way they said it (tone of voice, mannerism, etc.)
   c) because they, obviously, glanced at my nose
   d) because I could hear the enthusiasm in their voices

6. How do you know your perfect nose has effected your self-image?
   a) I like looking in mirrors now
   b) I make more eye contact with others now
   c) I am more eager to socialize now
   d) I spend less time being concerned about my nose now

7. Based on what you are feeling as you experience the above described scenario, rate how much you feel your physical attractiveness decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3

(dramatic decrease) (decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question circle **all** the choices which most closely describe what you experienced when you were visualizing the previous passage. Please take your time and answer as accurately as you can, and remember: **there are no wrong answers.**

1. What was your reaction to not being demoted?
   a) I felt relieved
   b) I felt joyful
   c) I felt proud
   d) I felt important

2. What was the thing you noticed, when others started to treat you differently?
   a) I was being engaged in conversation more often
   b) others spoke to me with a more respectful tone of voice
   c) people started to smile at me more often
   d) people started to listened to me more attentively

3. What was your reaction to the situation described in question 2?
   a) I felt more respected
   b) I felt more confident
   c) I felt more competent
   d) I felt more enthusiastic

4. How has your behavior at work changed in response to this new treatment?
   a) I make more eye contact when speaking with my co-workers now
   b) I am more willing to speak my opinions
   c) I speak more forcefully, less hesitantly
   d) I stand taller

5. How do you know your superiors are now more interested in your input and ideas?
   a) they seek me out in person more often now
   b) my ideas are implemented more often now
   c) a place is reserved for me at each meeting now
   d) they listen more attentively to me now

6. How do you know your efforts in the company are appreciated?
   a) others thank me for my work and my help
   b) others are more willing to help me when I need it
   c) there is now a sign with my name on it in front of my parking spot
   d) there is always someone who makes sure my supply cabinet is stocked

7. Based on what you are feeling as you experience the above described scenario, rate how much you feel your status in the company decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3

(dramatic decrease) (decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question circle **all** the choices which most closely describe what you experienced when you were visualizing the previous passage. Please take your time and answer as accurately as you can, and remember: **there are no wrong answers.**

1. What was your reaction to not being promoted?
   a) I felt disappointed
   b) I felt embarrassed
   c) I felt hurt pride
   d) I felt angry

2. What was the thing you noticed, when others started treating you differently?
   a) I was being engaged in conversation less often
   b) others spoke to me with less respectful tone of voice
   c) people did not smile at me as often
   d) people started to listen to me less attentively

3. What was your reaction to the situation described in question 2?
   a) I felt less respected
   b) I felt less confident
   c) I felt less competent
   d) I felt less enthusiastic

4. How has your behavior at work changed in response to this new treatment?
   a) I make less eye contact when speaking with my co-workers now
   b) I am are less willing to speak my opinions
   c) I speak less forcefully, more hesitantly
   d) My posture is more subdued

5. How do you know your superiors are now less interested in your input and ideas?
   a) they no longer seek me out in person as often
   b) my ideas are implemented less often now
   c) a place is no longer reserved for me at each meeting now
   d) they listen less attentively to me now

6. How do you know your efforts in the company are appreciated less now?
   a) others no longer thank me as often for my work and my help
   b) others are less willing to help me when I need it
   c) there is no longer a sign with my name on it in front of my parking spot
   d) there is no longer anyone who makes sure my supply cabinet is stocked

7. Based on what you are feeling as you experience the above described scenario, rate how much you feel your status in the company decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3

(dramatic decrease) (decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Page 6. 'SCALE VALIDATION'

In the field of psychology the issue of construct validation often arises in the fields of research which deal with hard-to-define concepts.
Following is a scale we are attempting to validate. Please take your time reading the instructions and make sure you understand what is being asked of you before you begin. If you have any questions, feel free to ask the researcher for clarification.

Page 7 & 8. Dependent Measure

SCALE VALIDATION

Below is a list of 30 mood words, please read each word carefully and make sure you understand the meaning of each word. Than indicate how strongly you are experiencing that particular emotion **at this moment**, and rate that intensity on a scale of 1 to 7 (where 1 is 'not at all' and 7 is 'very strongly'). Indicate your choice by circling the number on the scale next to each word.

It is very important that you try to answer as accurately and honestly as you can, so please take your time.

1. HAPPY 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

2. SEXY 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

3. ALIENATED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

4. HOSTILE 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

5. GLAD 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

6. SOCIABLE 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

7. SAD 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

8. ATTRACTIVE 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

9. CHEERFUL 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

10. APPEALING 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

11. ALONE 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

12. AGGRAVATED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

13. BLISSFUL 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

14. REJECTED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

15. GLOOMY 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

16. ANNOYED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

17. OUTGOING 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

18. DISCOURAGED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

19. CONFIDENT 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

20. APART 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

21. DESIRABLE 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

22. MAD 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

23. CHARMING 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

24. DISLIKED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

25. EXTROVERTED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

26. UNHAPPY 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

27. CONTENTED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

28. FRIENDLY 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

29. DEPRESSED 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

30. ANGRY 1.....2.....3.....4.....5.....6.....7
(not at all) (very strongly)

Page 9. Demographics Questionnaire

Please take a few minutes to tell us a little about yourself. Try to answer as accurately and as honestly as you can. Keep in mind that this study, as well as all others that you may participate in this semester, are completely anonymous and confidential. No information which you provide may be linked to your name or any other identification of your identity.

1. AGE: _____

2. SEX: _____

3. RACE (circle one): African American Hispanic/Latino White, non-Hispanic
Asian American West Indian Other _____

4. RELIGION: _____
How religious are you? (circle one): not at all slightly average very

5. WHERE WERE YOU BORN: in US_____State:_____
If other than US, please specify:
_____
How many years have you lived in US, if you were born elsewhere:_____

6. WHAT IS YOUR MARITAL STATUS (circle one): Single Married Divorced

7. DO YOU HAVE ANY CHILDREN:_____
If yes, how many and how old are they:_____

8. WHAT IS YOUR ACADEMIC STATUS: (circle one) freshman sophomore junior senior grad

9. WHAT IS THE HIGHEST ACADEMIC DEGREE YOU HOPE TO ACHIEVE:_____

10. ARE YOU PRESENTLY EMPLOYED:_____
If yes, what is your occupation and position:_____

11. WHAT ARE YOUR CAREER GOALS: (the occupation and position you hope to achieve):

_____

12. WITH RESPECT TO THE VISUALIZATION PASSAGE YOUREAD EARLIER IN THE STUDY: has that type of a scenario ever happen to you, or someone you know, in real life: _____
If yes, please describe:

_____

13. HOW WOULD YOU RATE YOURSELF, COMPARED TO OTHERS, ON PROFESSIONAL SUCCESS AND/OR STATUS (please use a scale of 1 to 10, with 1 being very low and 10 being very high): _____

14. HOW WOULD YOU RATE YOURSELF, COMPARED TO OTHERS, ON PHYSICAL ATTRACTIVENESS (please use a scale of 1 to 10, with 1 being very low and 10 being very high):

_____

Appendix B: Stimuli

Study #3

Stimulus Vignettes. Each participant received a booklet which contained one of the following four vignettes.

Physical Attractiveness Loss (Wife/Husband):

As far back as you can remember, you always knew who your wife was going to be. It is not that you have had a chance to get to know each other and decide that you want to be together, *you have never even met each other*. But, as is the custom in your culture, the marriages are arranged at birth, by the parents and approved by the town council.

Now that your wedding day has arrived, you look forward with anticipation to meeting your new wife and beginning your new life with a woman who will be at your side for the rest of your life.

You have heard of other cultures where couples are allowed to divorce if they decide that they no longer wish to be married, but to you it seems bizarre. Divorce is not something that is possible here, or even desired. After all, why would anyone want to quit a marriage. You can't quit your family and your parents just because they do not always make you happy. A marriage is the beginning of a new family and the same concepts apply, once two people are joined in matrimony, there is no option of quitting, just like there is no option of quitting your mother and father, your brothers and sisters.

And so, you find yourself standing in front of the elder council member who will be performing the matrimonial ceremony, surrounding you are your family and community members. You hear your new bride walk in, followed by her family, and take her place next to you. You turn to look at her face for the first time...Looking back at you is an attractive woman with beautiful eyes, perfect nose.

You've heard about her. She comes from a good family, much like your own. She is kind and intelligent. And now you have a face to go along with the description.

As the ceremony and the celebration finally ends, and the evening winds down, you dance with your new wife and realize that you are looking forward to spending your life with her. She tells you know that she feels the same way.

*****

Two years passes since you've gotten married. Your son will be one year old in a couple of months. And you and your wife look forward to having more children in the near future. Your family has been emotionally rewarding and a source of comfort to you. You have grown to love your wife, she has become a part of you, and you can not imagine a life without her.

And now you find yourself standing in a hospital room, looking at your wife in the hospital bed in front of you. Her face is covered with bandages. The doctor is telling you that her nose was broken in an accident. He is telling you that he did the best he could when he set it, but from the tone of his voice and the look on his face, you know that 'the best' was probably not all that great.

You hold your wife's hand and try to give her a reassuring smile as the doctor proceeds to remove her bandages. He stands next to you and puts his hand on your shoulder as you look at your wife's face for the first time since the accident. Her nose is no longer straight, as you remember it, it's now misshapen. You turn to the doctor for an explanation.

"We did the best we could," the doctor replies, "the best plastic surgeon was brought in and he performed the surgery on her nose. We both agree that, even though the swelling will go down, the deformation will be permanent."

'Permanent', that word was not something you wanted to hear, but it's something you have to live with now. You look back at your wife and realize that she hasn't looked in the mirror yet, she's looking at you.

*****

After your wife is released from the hospital and spent some time recovering at home, you and she return to your daily activities. And every time someone sees your wife for the first time after the accident, you are asked the same question,

"What happened to...your wife?"

But you knew what they mean, they mean 'what happened to your wife's nose?' You know that they notice the imperfection and you feel like everyone notices and everyone wants to ask the same question: 'What happened to your wife's nose?'

Your wife's nose, something you never thought about before, has become something that you are constantly aware of now. You find yourself looking at her nose more often now, and wondering if this is how it is going to be for the rest of your life. Permanent.

As far back as you can remember, you always knew who your husband was going to be. It is not that you have had a chance to get to know each other and decide that you want to be together, *you have never even met each other*. But, as is the custom in your culture, the marriages are arranged at birth, by the parents and approved by the town council.

Now that your wedding day has arrived, you look forward with anticipation to meeting your new husband and beginning your new life with a man who will be at your side for the rest of your life.

You have heard of other cultures where couples are allowed to divorce if they decide that they no longer wish to be married, but to you it seems bizarre. Divorce is not something that is possible here, or even desired. After all, why would anyone want to quit a marriage. You can't quit your family and your parents just because they do not always make you happy. A marriage is the beginning of a new family and the same concepts apply, once two people are joined in matrimony, there is no option of quitting, just like there is no option of quitting your mother and father, your brothers and sisters.

And so, you find yourself standing in the doorway of the chamber in which the matrimonial ceremony will be performed by the elder council member. In front of you, you see your future husband, surrounding him are his family and your community members. You walk in, followed by your family, and take your place next to him. You turn to look at him. And find an attractive man with beautiful eyes, perfect nose, looking back at you.

You've heard about him. He comes from a good family, much like your own. He is kind and intelligent. And now you have a face to go along with the description.

As the ceremony and the celebration finally ends, and the evening winds down, you dance with your new husband and realize that you are looking forward to spending your life with him. He tells you that she feels the same way.

*****

Two years passes since you've gotten married. Your son will be one year old in a couple of months. And you and your husband look forward to having more children in the near future. Your family has been emotionally rewarding and a source of comfort to you. You have grown to love your husband, he has become a part of you, and you can not imagine a life without him.

And now you find yourself standing in a hospital room, looking at your husband in the hospital bed in front of you. His face is covered with bandages. The doctor is telling you that his nose was broken in an accident. He is telling you that he did the best he could when he set it, but from the tone of his voice and the look on his face, you know that 'the best' was probably not all that great.

You hold your husband's hand and try to give him a reassuring smile as the doctor proceeds to remove his bandages. He stands next to you and puts his hand on your shoulder as you look at your husband's face for the first time since the accident. His nose is no longer straight, as you remember it, it's now misshapen. You turn to the doctor for an explanation.

"We did the best we could," the doctor replies, "the best plastic surgeon was brought in and he performed the surgery on his nose. We both agree that, even though the swelling will go down, the deformation will be permanent."

'Permanent', that word was not something you wanted to hear, but it's something you have to live with now. You look back at your husband and realize that he hasn't looked in the mirror yet, he's looking at you.

*****

After your husband is released from the hospital and spent some time recovering at home, you and he return to your daily activities. And every time someone sees your husband for the first time after the accident, you are asked the same question,

"What happened to...your husband?"

But you know what they mean, they mean 'what happened to your husband's nose?' You know that they notice the imperfection and you feel like everyone notices and everyone wants to ask the same question: 'What happened to your husband's nose?'

Your husband's nose, something you never thought about before, has become something that you are constantly aware of now. You find yourself looking at his nose more often now, and wondering if this is how it is going to be for the rest of your life. Permanent.

<u>Physical Attractiveness Gain (Husband/similar story line for wife – not included)</u>

As far back as you can remember, you always knew who your husband was going to be. It is not that you have had a chance to get to know each other and decide that you want to be together, ***you have never even met each other***. But, as is the custom in your culture, the marriages are arranged at birth, by the parents and approved by the town council.

Now that your wedding day has arrived, you look forward with anticipation to meeting your new husband and beginning your new life with a man who will be at your side for the rest of your life.

You have heard of other cultures where couples are allowed to divorce if they decide that they no longer wish to be married, but to you it seems bizarre. Divorce is not something that is possible here, or even desired. After all, why would anyone want to quit a marriage. You can't quit your family and your parents just because they do not always make you happy. A marriage is the beginning of a new family and the same concepts apply, once two people are joined in matrimony, there is no option of quitting, just like there is no option of quitting your mother and father, your brothers and sisters.

And so, you find yourself standing in the doorway of the chamber in which the matrimonial ceremony will be performed by the elder council member. In front of you, you see your future husband, surrounding him are his family and your community members. You walk in, followed by your family, and take your place next to him. You turn to look at his face for the first time...And find a man with beautiful eyes looking back at you, a man who would be very attractive, except that he has a slightly misshapen nose (a 'natural deformity' that you have heard about, but have never seen).

You've heard about him. He comes from a good family, much like your own. He is kind and intelligent. And now you have a face to go along with the description.

As the ceremony and the celebration finally ends, and the evening winds down, you dance with your new husband and realize that you are looking forward to spending your life with him. He tells you that she feels the same way.

*****

Two years passes since you've gotten married. Your son will be one year old in a couple of months. And you and your husband look forward to having more children in the near future. Your family has been emotionally rewarding and a source of comfort to you. You have grown to love your husband, he has become a part of you, and you can not imagine a life without him.

And now you find yourself standing in a hospital room, looking at your husband in the hospital bed in front of you. His face is covered with bandages. The doctor is telling you that his nose was broken in an accident. He is telling you that he did the best he could when he set it, and from the tone of his voice and the smile on his face, you know that 'the best' was probably better than expected.

You hold your husband's hand and try to give him a reassuring smile as the doctor proceeds to remove his bandages. He stands next to you and puts his hand on your shoulder as you look at your husband's face for the first time since the accident. His nose is no longer misshapen, as you remember it, it's now perfectly straight. You turn to the doctor for an explanation.

"We did the best we could," the doctor repeated with a well-deserved smile of self-satisfaction, "the best plastic surgeon was brought in and he performed the surgery on his nose. The swelling will go down. The slight natural deformity is permanently corrected."

'Permanently corrected', those were not the words you were expecting to hear, but it's definitely something you can live with. You look back at your husband and realize that he hasn't looked in the mirror yet, he's looking at you.

*****

After your husband is released from the hospital and spent some time recovering at home, you and he return to your daily activities. And every time someone sees your husband for the first time after the accident, you are asked the same question,

"What happened to...your husband?"

But you know what they mean, they mean 'what happened to your husband's nose?' You know that they notice the change, but you do not feel offended

Your husband's nose, something you were constantly aware of before, has become something that no longer troubles you. You find yourself looking at his nose now and remembering how much time you spent worrying about spending the rest of your life with a husband who has a 'natural deformity', you no longer have to think about that.

It's been permanently corrected.

Status Gain (Wife/ similar story line for husband – not included)

As far back as you can remember, you always knew who your wife was going to be. It is not that you have had a chance to get to know each other and decide that you want to be together, *you have never even met each other*. But, as is the custom in your culture, the marriages are arranged at birth, by the parents and approved by the town council. The town council is made up of both men and women from the town.

Now that your wedding day has arrived, you look forward with anticipation to meeting your new wife and beginning your new life with a woman who will be at your side for the rest of your life.

You have heard of other cultures where couples are allowed to divorce if they decide that they no longer wish to be married, but to you it seems bizarre. Divorce is not something that is possible here, or even desired. After all, why would anyone want to quit a marriage. You can't quit your family and your parents just because they do not always make you happy. A marriage is the beginning of a new family and the same concepts apply. Once two people are joined in matrimony, there is no option of quitting, just like there is no option of quitting your mother and father, your brothers and sisters.

And so, you find yourself standing in front of the elder council member who will be performing the matrimonial ceremony. Surrounding you are your family and community members. You hear your new bride walk in, followed by her family, and take her place next to you.

You've heard about her. She comes from a good family, much like your own. She is kind and intelligent. She holds a position within the city council and although she works hard, she doesn't always receive the respect she deserves.

As the ceremony and the celebration finally ends and the evening winds down, you dance with your new wife an realize that you are looking forward to spending your life with her. She tells you that she feels the same way.

*****

Two years passes since you've gotten married. Your son will be one year old in a couple of months. And you and your wife look forward to having more children in the near future. Your family has been emotionally rewarding and a source of comfort to you. You have grown to love your wife, she has become a part of you, and you can not imagine a life without her.

The city that you live in has undergone major changes in the last two years as well. Negotiations about uniting with a bordering town have been going on for a while, and finally an agreement has been reached. The laws and customs of this neighboring town are the same as your town's, such as matrimony customs, and city council appointments, as a result there were no personal tensions or prejudices between the peoples. In general, most people's lives were little, if at all, affected by this unification. For your wife, however, the doubling of the population, did produce a noticeable effect.

Although her position and duties within the council remained the same, she began to notice a difference in the way people were treating her. No one became overly nice or inappropriate to her. However, before the unification, people would rarely recognize and greet her. Now they always do. Someone always respectfully holds doors open for her and makes sure her coffee is ready when she arrives in the morning. No one had ever done that before. Now with so many new faces at the council, she expected the newly arrived members to receive special attention, but the opposite happened. At first she thought that this was a temporary occurrence and people were just trying to make the transition less threatening, but the situation did not change. It was almost as though her position was raised, although everything about her job remained the same.

Before the new council members arrived, her superiors sometimes asked for her ideas and input, but she never felt as though her ideas carried very much importance. Now, she always feels encouraged by her superiors and colleagues to express her opinions, she is always asked for her point of view, and she feels that what she says is seriously considered and appreciated. Before, no one seemed to notice her presence at weekly meetings. Now, those meetings never begin until she arrives.

Her productivity and efficiency had not changed in all this time, and from what she understands, there are no personal reasons for the changes she experiences.

Although personally she does not feel any more or less popular, professionally she feels a gain in status.

Status Loss (Husband/wife not included)

As far back as you can remember, you always knew who your husband was going to be. It is not that you have had a chance to get to know each other and decide that you want to be together, *you have never even met each other*. But, as is the custom in your culture, the marriages are arranged at birth, by the parents and approved by the city council. The city council is made up of both men and women from this town.

Now that your wedding day has arrived, you look forward with anticipation to meeting your new husband and beginning your new life with a man who will be at your side for the rest of your life.

You have heard of other cultures where couples are allowed to divorce if they decide that they no longer wish to be married, but to you it seems bizarre. Divorce is not something that is possible here, or even desired. After all, why would anyone want to quit a marriage. You can't quit your family and your parents just because they do not always make you happy. A marriage is the beginning of a new family and the same concepts apply, once two people are joined in matrimony, there is no option of quitting, just like there is no option of quitting your mother and father, your brothers and sisters.

And so, you find yourself standing in the doorway of the chamber in which the matrimonial ceremony will be performed by the elder council member. In front of you,

you see your future husband, surrounding him are his family and your community members. You walk in, followed by your family, and take your place next to him.

You've heard about him. He comes from a good family, much like your own. He is kind and intelligent. He holds a position of respect and authority within the city council and enjoys the privileges such a position affords him.

As the evening winds down and the ceremony and celebration finally ends, you dance with your new husband an realize that you are looking forward to spending your life with him. He tells you that he feels the same way.

*****

Two years passes since you've gotten married. Your son will be one year old in a couple of months. And you and your husband look forward to having more children in the near future. Your family has been emotionally rewarding and a source of comfort to you. You have grown to love your husband, he has become a part of you, and you can not imagine a life without him.

The city that you live in has undergone major changes in the last two years as well. Negotiations about uniting with a bordering town have been going on for a while, and finally an agreement has been reached. The laws and customs of this neighboring town are the same as your town's, such as matrimony customs, and city council appointments, as a result there were no personal tensions or prejudices between the peoples. In general, most people's lives were little, if at all, affected by this unification. For your husband, however, the doubling of the population, did produce a noticeable effect.

Although his position and duties within the council remained the same, he began to notice a difference in the way people were treating him. No one was rude or inappropriate with him. However, people always used to recognize him and greet him. Someone would always respectfully hold doors open for him and make sure his coffee was ready when he arrived in the morning. Now with so many new faces at the council, no one does that for him anymore, although they continue to do so for the newly arrived members. At first he thought that this was a temporary occurrence and people were just trying to make the new members feel welcome, but the situation did not change. It was almost as though his position diminished, although everything about his job remained the same.

Before the others arrived, he always felt encouraged by his superiors to express his opinions and ideas, he was always asked for his input and points of view. Now, he is rarely asked for his opinion, and he no longer feels like it carries as much importance for them as it had in the past.

His co-council members and colleagues now inform him what the meetings were about, whereas before there was never a meeting at which his presence was not required.

His productivity and efficiency has not changed in all this time, and from what he understands, there are no personal reasons for the changes he experiences.

Although personally he does not feel disrespected by anyone, professionally he feels a loss in status.

Follow-up questions. Each participant received a booklet which contained one of the following four questionnaires, depending on the condition.

Status Loss (Wife/Husband):

Remember: the story you just finished reading was not about somebody else, it was about you. In order for us to be able to understand others, it is important that we are able to put ourselves into their places in life, even if it's only by imagining ourselves there. Do the best you can, and imagine the situation with *as much detail and as vividly as possible*.

Instructions: Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question, please circle **all** the choices that most closely describe what you were experiencing as you were visualizing the story you just read. Take your time, answer as accurately as you can, and remember: **there are no wrong answers**.

1. At the *beginning* of the story, when your wife was *first* described to you, please rate how successful you imagined her to be:

-3.....-2.....-1.....0.....+1.....+2.....+3

(very unsuccessful) (unsuccessful) (slightly below average) (average) (slightly above) (successful) (very successful)

2. What was your reaction to your wife's loss of status?

(circle **all** that apply):

a) I felt disappointed
b) I felt embarrassed
c) I felt hurt pride
d) I felt angry

3. What was the thing you noticed, when others started treating your wife differently?

(circle **all** that apply):

a) she was being engaged in conversation less often
b) others spoke to her with less respectful tone of voice
c) people did not smile at her as often
d) people started to listen to her less attentively

4. What was your reaction to the situation described in question 3?

(circle **all** that apply):

a) I felt less respected
b) I felt less confident
c) I felt less competent
d) I felt less enthusiastic

5. How has your wife's behavior at work changed in response to this new treatment?

(circle **all** that apply):

a) She makes less eye contact when speaking with her co-workers now
b) She is less willing to speak her opinions
c) She speaks less forcefully, more hesitantly
d) Her posture is more subdued

6. How does she know her superiors are now less interested in her input and ideas?

(circle **all** that apply):

a) they no longer seek her out in person as often
b) her ideas are implemented less often now
c) a place is no longer reserved for her at each meeting now
d) they listen less attentively to her now

7. How does she know her efforts in the company are appreciated less now?

(circle **all** that apply):

a) others no longer thank her as often for her work and her help
b) others are less willing to help her when she needs it
c) there is no longer a sign with her name on it in front of her parking spot
d) there is no longer anyone who makes sure her supply cabinet is stocked

8. Based on what you are feeling as you experience the above-described scenario, rate how much you feel your wife's status in the company decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3
(dramatic decrease) (decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Remember: the story you just finished reading was not about somebody else, it was about you. In order for us to be able to understand others, it is important that we are able to put ourselves into their places in life, even if it's only by imagining ourselves there. Do the best you can, and imagine the situation with *as much detail and as vividly as possible*.

Instructions: Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question, please circle **all** the choices which most closely describe what you were experiencing as you were visualizing the story you just read. Take your time, answer as accurately as you can, and remember: **there are no wrong answers**.

1. At the *beginning* of the story, when your husband was *first* described to you, please rate how successful you imagined him to be:

-3.....-2.....-1.....0.....+1.....+2.....+3
(very unsuccessful) (unsuccessful) (slightly below average) (average) (slightly above) (successful) (very successful)

2. What was your reaction to your husband's loss of status?

(circle **all** that apply):

a) I felt disappointed
b) I felt embarrassed
c) I felt hurt pride
d) I felt angry

3. What was the thing you noticed, when others started treating your husband differently?

(circle **all** that apply):

a) he was being engaged in conversation less often
b) others spoke to him with less respectful tone of voice
c) people did not smile at him as often
d) people started to listen to him less attentively

4. What was your reaction to the situation described in question 3?

(circle **all** that apply):

a) I felt less respected
b) I felt less confident
c) I felt less competent
d) I felt less enthusiastic

5. How has your husband's behavior at work changed in response to this new treatment?
(circle **all** that apply):
a) He makes less eye contact when speaking with his co-workers now
b) He is less willing to speak his opinions
c) He speaks less forcefully, more hesitantly
d) His posture is more subdued

6. How does he know his superiors are now less interested in his input and ideas?
(circle **all** that apply):
a) they no longer seek him out in person as often
b) his ideas are implemented less often now
c) a place is no longer reserved for him at each meeting now
d) they listen less attentively to him now

7. How does he know his efforts in the company are appreciated less now?
(circle **all** that apply):
a) others no longer thank him as often for his work and his help
b) others are less willing to help him when he needs it
c) there is no longer a sign with his name on it in front of his parking spot
d) there is no longer anyone who makes sure his supply cabinet is stocked

8. Based on what you are feeling as you experience the above-described scenario, rate how much you feel your husband's status in the company decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3
(dramatic decrease) (decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Status Gain (Wife/husband not included):

Remember: the story you just finished reading was not about somebody else, it was about you. In order for us to be able to understand others, it is important that we are able to put ourselves into their places in life, even if it's only by imagining ourselves there. Do the best you can, and imagine the situation with *as much detail and as vividly as possible.*

Instructions: Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question, please circle **all** the choices that most closely describe what you were experiencing as you were visualizing the story you just read. Take your time, answer as accurately as you can, and remember: **there are no wrong answers.**

1. At the *beginning* of the story, when your wife was *first* described to you, please rate how successful you imagined her to be:
-3.....-2.....-
1.....0.....+1.....+2.....+3
(very unsuccessful) (unsuccessful) (slightly below average) (average) (slightly above average) (successful) (very successful)

2. What was your reaction to your wife's apparently raised position?
(circle **all** that apply):
a) I felt relieved
b) I felt joyful
c) I felt proud
d) I felt important

3. What was the thing you noticed, when others started to treat your wife differently?
(circle **all** that apply):
a) she was being engaged in conversation more often
b) others spoke to her with a more respectful tone of voice
c) people started to smile at her more often
d) people started to listened to her more attentively

4. What was your emotional reaction to the situation described in question 3?
(circle **all** that apply):
a) I felt more respected
b) I felt more confident
c) I felt more competent
d) I felt more enthusiastic

5. How has your wife's behavior at work changed in response to this new treatment?
(circle **all** that apply):
a) She is more confident when speaking with her co-workers now
b) She is more willing to speak her opinions
c) She speaks more forcefully, less hesitantly
d) She stands taller

6. How does your wife know her superiors are now more interested in her input and ideas?
(circle **all** that apply):
a) they seek her out in person more often now
b) her ideas are implemented more often now
c) a place is reserved for her at each meeting now
d) they listen more attentively to her now

7. How does she know her efforts in the council are appreciated?
(circle **all** that apply):
a) others thank her for her work and her help
b) others are more willing to help her when she needs it
c) there is now a sign with her name on it on her office door
d) there is now someone who makes sure her supplies at work are always stocked

8. Based on what you are feeling as you experience the above described scenario, rate how much you feel your wife's status in the council decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3
(dramatic decrease) (decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Physical Attractiveness Gain (Husband/wife not included):

Remember: the story you just finished reading was not about somebody else, it was about you. In order for us to be able to understand others, it is important that we are able to put ourselves into their places in life, even if it's only by imagining ourselves there. Do the best you can, and imagine the situation with *as much detail and as vividly as possible.*

Instructions: Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question, please circle **all** the choices which most closely describe what

you were experiencing as you were visualizing the story you just read. Take your time, answer as accurately as you can, and remember: **there are no wrong answers.**

1. At the *beginning* of the story, when your husband was *first* described to you, please rate how attractive you visualized him to be:

-3.....-2.....-1.....0.....+1.....+2.....+3

(very unattractive) (unattractive) (slightly below average) (average) (slightly above) (attractive) (very attractive)

2. How did you know the doctor was pleased with the outcome?
   (circle **all** that apply):
   a) the excited tone of his voice
   b) his positive facial expression
   c) his enthusiasm about having me see it

3. The first time you looked into your husband's face after surgery, what did you notice?
   (circle **all** that apply):
   a) how different his face looks now
   b) how attractive he looks now
   c) how happy and excited he looks
   d) I noticed nothing *but* his perfect nose

4. What was your reaction to the words 'permanently corrected'?
   (circle **all** that apply):
   a) I was excited
   b) I was happy
   c) I was elated
   d) I was pleased

5. How did you experience the above reaction (in question 4)?
   (circle **all** that apply):
   a) I felt like laughing
   b) I felt like hugging someone
   c) I felt like running outside and telling everyone

6. How did you know your friends were referring to your husband's nose when they were
   (circle **all** that apply):
   inquiring about his condition?
   a) because they had pleased looks on their faces
   b) it was the way they said it (tone of voice, mannerism, etc.)
   c) because they, obviously, avoided looking in my eyes
   d) because I could hear the enthusiasm in their voices

7. How do you know that your husband's corrected nose has effected your image of him?
   (circle **all** that apply):
   a) I look at him more often now
   b) I make more eye contact with others now
   c) I am more eager to socialize now
   d) I spend less time being concerned with noses now and comparing my husband's nose to others'

8. Based on what you are feeling as you experience the above described scenario, rate how much you feel your husband's physical attractiveness decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3
(dramatic decrease)(decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Physical Attractiveness Loss (Wife/husband not included):

Remember: the story you just finished reading was not about somebody else, it was about you. In order for us to be able to understand others, it is important that we are able to put ourselves into their places in life, even if it's only by imagining ourselves there. Do the best you can, and imagine the situation with *as much detail and as vividly as possible.*

Instructions: Please read carefully the following questions. Make sure you read all the choices before answering. When answering each question, please circle **all** the choices that most closely describe what you were experiencing as you were visualizing the story you just read. Take your time, answer as accurately as you can, and remember: **there are no wrong answers.**

1. At the *beginning* of the story, when your wife was *first* described to you, please rate how attractive you visualized her to be:
-3.....-2.....-1.....0.....+1.....+2.....+3
(very unattractive) (unattractive) (little below average) (ave) (slightly above average) (attractive) (very attractive)

2. How did you know the doctor was disappointed with the outcome?
(circle **all** that apply):
a) the sympathetic tone of his voice
b) his nervous facial expression
c) his apparent refusal to meet my eyes

3. The first time you looked into your wife's face after surgery, what did you notice?
(circle **all** that apply):
a) how different her face looks now
b) how unattractive she looks now
c) how sad she looks
d) I noticed nothing *but* her crooked nose

4. What was your reaction to the word 'permanent'?
(circle **all** that apply):
a) I was shocked
b) I was angry
c) I was depressed
d) I was sad

5. How did you experience the above reaction (in question 4)?
(circle **all** that apply):
a) I felt like crying
b) I felt like hitting someone/something
c) I felt like being alone

6. How did you know your friends were referring to your wife's nose when they were (circle **all** that apply):
inquiring about her condition?
   a) because they had disgusted looks on their faces
   b) it was the way they said it (tone of voice, mannerism, etc.)
   c) because they, obviously, avoided looking in my eyes
   d) because I could hear the pity in their voices

7. How do you know that your wife's crooked nose has effected your image of her? (circle **all** that apply):
   a) I avoid looking at her now
   b) I avoid eye contact with others now
   c) I am more reluctant to socialize now
   d) I notice noses more often now and find myself comparing my wife's nose to others'

8. Based on what you are feeling as you experience the above described scenario, rate how much you feel your wife's physical attractiveness decreased or increased as a result of the described events.

-3.....-2.....-1.....0.....+1.....+2.....+3

(dramatic decrease) (decrease) (slight decrease) (not at all) (slight increase) (increase) (dramatic increase)

Exp.#1 Evaluation Questionnaire

The following questions are about **Experiment #1**: Perspective-Taking & Cross-Cultural Understanding, which you completed at the beginning of the session. Please answer the questions as honestly as you can. Your answers will greatly assist us in evaluating this study and help us in designing future research.

1. With respect to the story you read in Experiment #1: has anything similar ever happen to you, or someone you know, in real life? (circle one): Yes No

If Yes, please describe briefly: _____

2. While reading the story: rate how successful you were at imagining that you were actually living in that culture? (circle one):

1.....2.....3.....4.....5
(not at all) (somewhat) (very successful)

3. When the social custom of arranged marriage was described, were you able to imagine what that would be like? (circle one): Yes No

How successful you were at imagining it? (circle one):

1.....2.....3.....4.....5
(not at all) (somewhat) (very successful)

4. When the social custom of "no possibility of divorce" was described, did the idea enter your mind anyway, as you were reading the story? (circle one): Yes No

Instructions for questions 5-9: As you may know, our beliefs and expectation affect our perceptions. The following questions are about *your* beliefs and expectations that may have affected your experience of some of the issues described in Exp.#1. PLEASE CIRCLE HOW STRONGLY YOU AGREE/DISAGREE WITH THE FOLLOWING STATEMENTS:

5. Divorce is not a something to be ashamed of, it is the proper action when the marriage is no longer satisfying to one or both partners.

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (have no opinion) (strongly agree)

6. There is no difference between what men and women can accomplish professionally, and both genders should be equally recognized and rewarded for their achievements.

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (have no opinion) (strongly agree)

7. Most married people are unfaithful to their spouses at some time during their married lives.

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (have no opinion) (strongly agree)

8. People are more likely to be unfaithful to their spouses if someone else in their lives was showing romantic interest in them or is pursuing them sexually.

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (have no opinion) (strongly agree)

9. Divorce is not the only answer if a marriage is in trouble, most problems can be worked out.

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (have no opinion) (strongly agree)

Sociosexuality Scale:

1. Have you ever been in a serious or committed romantic relationship?
(check one) Yes _____ No _____
If Yes, did this relationship include sexual intercourse?
(check one) Yes _____ No _____

2. Are you currently in a serious or committed (exclusive) romantic relationship?
(check one) Yes _____ No _____
If Yes, does this relationship include sexual intercourse?
(check one) Yes _____ No _____

3. What is your sexual preference? (check one):
Homosexual _____ Heterosexual _____ Bisexual _____

4. What is the total number of different people with whom you have engaged in sexual intercourse? _____

5. With how many different partners have you had sex (sexual intercourse) within the past year? _____

6. With how many different partners do you foresee yourself having sexual intercourse during the next five years? (Please give a specific, realistic estimate.)
_____

7. With how many people have you had sex only one time? (one night stand)
_____

8. Whenever you have sexual fantasies, how often do they involve someone other than your current dating partner?
a.) never b.) sometimes c.) often d). almost always e.) always

On each of the remaining items, please circle the **one number** that best indicates your opinion.

9. Sex without love is OK.
I strongly agree I strongly disagree
1 2 3 4 5 6 7 8 9

10. I can imagine myself being comfortable and enjoying "casual" sex with different partners.
I strongly agree I strongly disagree
1 2 3 4 5 6 7 8 9

11. I would have to be closely attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her.

I strongly agree I strongly disagree
1 2 3 4 5 6 7 8 9

Demographics Questionnaire:

General Background Information

Please take a few minutes to tell us a little about yourself. Try to answer as accurately and as honestly as you can. Keep in mind that this study, as well as all others that you may participate in this semester, are completely anonymous and confidential. No information which you provide may be linked to your name or any other identification of your identity.

1. AGE: _____

2. SEX :_____

3. RACE (circle one):

African American	Hispanic/Latino	White, non-Hispanic
Asian American	West Indian	Other _____

4. RELIGION (circle one):

Protestant/Christian	Catholic	Jewish
Muslim	Buddhist	Other _____

How religious are you? (circle one):
not at all slightly average very

5. WHERE WERE YOU BORN: in US_____ State: _____
If other than US, please specify: _____
How many years have you lived in US, if you were born elsewhere:_

6. IS ENGLISH YOUR NATIVE LANGUAGE:_____
If not, what was your first language:_____

7. WHAT IS YOUR ACADEMIC STATUS: (circle one)
freshman sophomore junior senior grad

8. WHAT IS THE HIGHEST ACADEMIC DEGREE YOU HOPE TO ACHIEVE:_____

9. ARE YOU PRESENTLY EMPLOYED:_____
If yes, in what area do you work? _____
What is your position:_____

10. WHAT ARE YOUR CAREER GOALS: (the occupation and position you hope to achieve):

_____

Experimenter Evaluation Questionnaire

American Psychological Association (APA) sets ethical principles for conduct of experimenters. Because social norms and views are constantly changing, the APA needs to regularly update standards and review their policy.

We request that you take a few minutes to evaluate your impressions of the experimenter.

Be assured that your answers are anonymous and confidential.

Please answer as honestly as you can using the 7 point scales provided with each question in the following category:

Part I. Professional Conduct & Demeanor

a.) The experimenter was helpful:

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (disagree) (slightly disagree) (didn't notice) (slightly agree) (agree) (strongly agree)

b.) The experimenter was clear when giving instructions:

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (disagree) (slightly disagree) (didn't notice) (slightly agree) (agree) (strongly agree)

c.) The experimenter was polite:

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (disagree) (slightly disagree) (didn't notice) (slightly agree) (agree) (strongly agree)

d.) The experimenter seemed authoritarian and superior:

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (disagree) (slightly disagree) (didn't notice) (slightly agree) (agree) (strongly agree)

e.) The experimenter made me feel inferior:

-3.....-2.....-1.....0.....+1.....+2.....+3
(strongly disagree) (disagree) (slightly disagree) (didn't notice) (slightly agree) (agree) (strongly agree)

Part II. Gender-Related Issues

ANSWER ONLY IF YOUR EXPERIMENTER IS OPPOSITE SEX FROM YOU!
If your Experimenter is the *same* sex as you, please skip this page.

Appropriate behavior of scientists and researchers includes gender-sensitive behavior (insensitivity to gender issues sometimes may lead to inappropriate behavior and even sexual harassment).

Important: Please regard the following questions as a survey of possible issues that the APA might need to address, and not as a critical evaluation of yourself or your experimenter.

Once again, we would like to ask that you answer as honestly as you can, no one will ever be able to identify you by your answers, including your experimenter.

a.) Please rate how physically attractive you thought the experimenter was:

-3.....-2.....-1.....0.....+1.....+2.....+3
(very unattractive) (unattractive) (slightly)(didn't notice) (slightly) (attractive) (very attractive)

b.) If you had met the experimenter in a social setting, is he/she the kind of person you might like to get to know better, maybe even date (if you were both single)?

-2.....-1.....0.....+1.....+2
(definitely not) (probably not) (maybe) (probably yes) (definitely yes)

c.) If, at a later time, the experimenter showed romantic or sexual interest in you, would you be (circle one): Offended or Flattered

d.) If, at a later time, there is an opportunity to socialize with the experimenter would you take it?

-2.....-1.....0.....+1.....+2
(definitely not) (probably not) (maybe) (probably yes) (definitely yes]

Appendix C: Supplementary Analyses

Study 1

Dependent measure used in the analyses and results for the study was 'Affect Balance' calculated as:

Affect Balance = (sum of positive affect items) – (sum of negative affect items)

or

Affect Balance = Positive Affect (PA) – Negative Affect (NA)

Three separate **ANOVAs** were carried out, each with one of the following as dependent variable:

Dependent variables: a.) Positive affect
b.) Negative affect
c.) Affect Balance

Source:	Dependent Variable:	$F_{(1,192)}$	Sig.
Sex of Subject	Positive affect	.52	.47
	Negative affect	.13	.72
	Affect Balance	.42	.52
Type of Resource	Positive affect	1.87	.18
	Negative affect	.69	.41
	Affect Balance	1.76	.19
Gain / Loss	Positive affect	24.33	.00**
	Negative affect	8.9	.00**
	Affect Balance	22.81	.00**
Sex of Subject by Type of Resource	Positive affect	1.48	.22
	Negative affect	.15	.90
	Affect Balance	.59	.44
Sex of Subject by Gain/Loss	Positive affect	.51	.48
	Negative affect	3.72	.06
	Affect Balance	2.85	.09
Type of Resource by Gain / Loss	Positive affect	2.65	.12
	Negative affect	.95	.33
	Affect Balance	2.46	.12
Sex of Subject by Type of Resource by Gain / Loss [a]	Positive affect	2.09	.15
	Negative affect	5.14	.03*
	Affect Balance	5.42	.02*

[a] Table of means for this interaction is included
* Significant at .05 level (graph included)
** Significant at .01 level

Study 1

Table of means for the dependent measures of positive affect (PA), negative affect (NA), and Affect Balance (AB) for the 3-way interaction of:

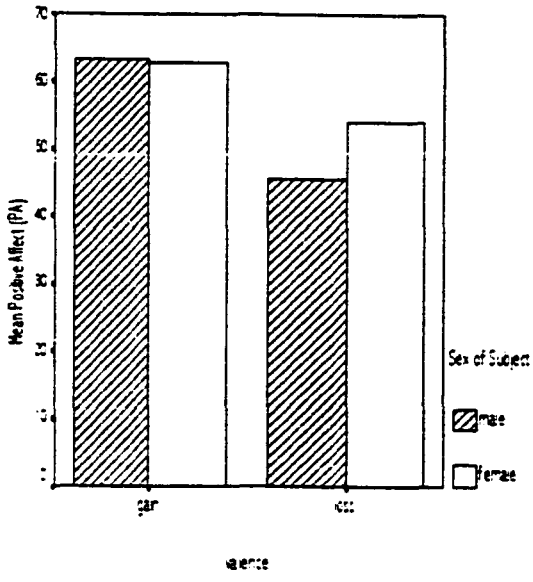
Sex of Subject by Type of Resource by Gain / Loss

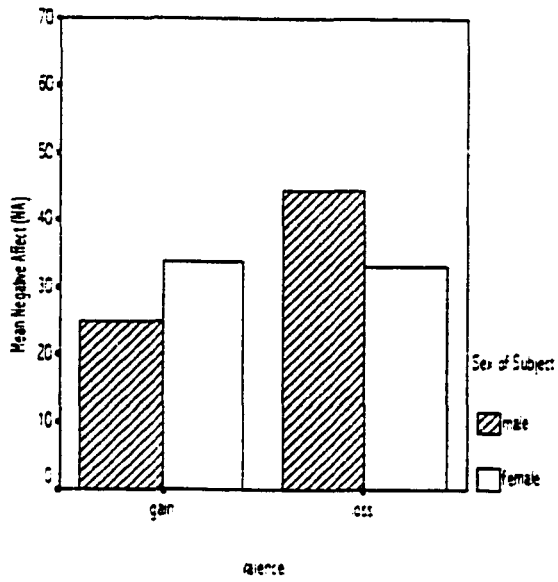
Dependent Variable	Sex of Subject	Resource	Gain / Loss	Mean
Positive Affect	male	status	gain	63.2
			loss	45.6
		physical attractiveness	gain	56.7
			loss	54.6
	female	status	gain	62.7
			loss	53.9
		physical attractiveness	gain	57.2
			loss	49.1
Negative Affect	male	status	gain	24.9
			loss	44.3
		physical attractiveness	gain	34.3
			loss	38.3
	female	status	gain	33.8
			loss	33.2
		physical attractiveness	gain	32.9
			loss	38.5
Affect Balance	male	status	gain	38.2
			loss	1.4
		physical attractiveness	gain	22.4
			loss	13.3
	female	status	gain	29.0
			loss	20.7
		physical attractiveness	gain	24.2
			loss	10.6

Study #1

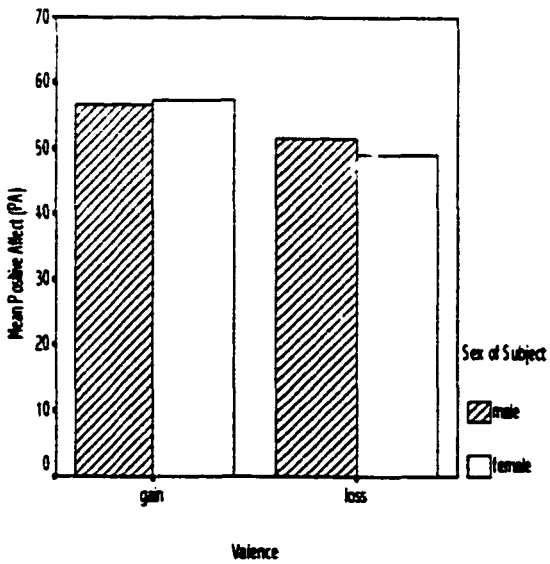
Mean values of positive affect (PA) and negative affect (NA) for male and female participants in each of the four conditions.

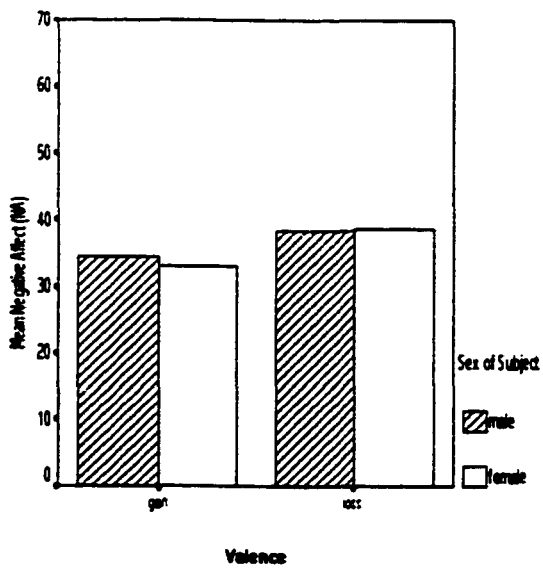
a.) Status Conditions:





b.) Physical Attractiveness Conditions:





Study #1

Responses to the Demographics Questionnaire and associated Affect Balance scores.

Item:	Sample Distribution: (N)	Effect of Item on AB Scores:[a]
Race	African Amer.: 33 W.Indies: 15 Asian Amer: 19 White: 111 Hispanic: 21 Other: 1	$F_{(2,161)} = 3.03$ $p < .05$*
Religion	Catholic: 96 Buddhist: 2 Jewish: 51 Other: 1 Muslim: 7 None: 43	$F_{(2,167)} = 1.45$ $p > .05$
Birthplace	born in US: 119 in US less than 5 years: 26 in US more than 5 years: 55	$F_{(2,174)} = 1.31$ $p > .05$
Siblings	none: 20 </= 5: 176 >/= 6: 4	---
Marital Status	single: 193 married: 3 divorced: 4	---
Children	none: 191 </= 5: 9 >5: 0	---
Academic Status	freshman: 117 junior: 25 sophomore: 49 senior: 9	$F_{(2,170)} = 1.25$ $p > .05$
Highest Degree hoped for	HS: -- MA: 90 BA: 54 PhD: 56	$F_{(2,176)} = .16$ $p > .05$
Present Employment	not employed: 94 skilled: 9 entry level: 97 professional: --	$F_{(1,177)} = .54$ $p > .05$
Career Goals	none: 9 skilled: 109 entry level: -- professional: 82	$F_{(2,176)} = .65$ $p > .05$
Has the scenario ever happen?	yes: 30 no: 170	(results discussed in main text)
Rate your Status	Results of responses and analyses presented in the main text of the paper.	"
Rate your Physical Attractiveness	Results of responses and analyses presented in the main text of the paper.	"

[a] The reported analyses and significance scores are for the interaction of Demographics Questionnaire item with the significant 3-way interaction of Sex of Subject by Type of Resource by Gain/Loss.

* Significant at .05 level (table of means included)

The only item on the demographics questionnaire to which the participants' responses (on the dependent measure) differed significantly was race. Following is a distribution of subjects in each of the race categories available on the questionnaire. As can seen from this distribution and the following associated affect scores for each of the conditions in the study, the effect is not of race, per se, but rather of random assignment of subjects to conditions in the study. That is, the relatively negative response of the Asian American group of participants, for example, (see below) should not necessarily be interpreted as a product of race. Rather, the fact that this relatively small subgroup (N=19) were, as a result of randomly assignment, unequally distributed in all the conditions of the study, with an almost 2:1 ratio in the loss to gain assignments (see table on the following page). Likewise, the relatively high positive response of the African American subgroup of participants is more prudently interpreted as the relative distribution of subjects in the study conditions, with a 2:1 ratio of gain to loss condition distribution of participants, and not an effect of race.

Dependent variable: Affect Balance

Race of subject:	Mean	N	Std. Deviation
African American	33.67	33	22.52
Asian American	-.63	19	33.27
Hispanic/Latino	17.67	21	26.61
West Indian	24.80	15	23.58
White	19.38	111	25.44
Other	3.00	1	----

STATUS

	GAIN		LOSS	
	Male	Female	Male	Female
African-American	39.6 N = 7 SD = 13.5	46.5 N = 6 SD = 15.8	20.0 N = 1	19.0 N = 4 SD = 39.1
Asian-American	21.0 N = 1	-27.0 N = 1	-17.0 N = 5 SD = 28.1	15.0 N = 2 SD = 26.5
Hispanic/ Latino	54.5 N = 2 SD = 4.95	16.6 N = 5 SD = 25.9	-31.0 N = 1	54.0 N = 1
W. Indies	36.0 N = 2 SD = 9.9	34.7 N = 2 SD = 26.5	0 N = 1	33.0 N = 3 SD = 24.3
White	36.7 N = 13 SD = 16.7	28.6 N = 10 SD = 33.0	7.7 N = 17 SD = 25.1	17.3 N = 15 SD = 23.9

PHYSICAL ATTRACTIVENESS

	GAIN		LOSS	
	Male	Female	Male	Female
African-American	34.8 N = 5 SD = 24.9	39.0 N = 4 SD = 15.0	29.4 N = 5 SD = 15.9	-18.0 N = 1
Asian-American	11.8 N = 5 SD = 31.0	N = 0	21.3 N = 3 SD = 27.65	-37.0 N = 2 SD = 53.7
Hispanic/ Latino	7.0 N = 2 SD = 9.9	15.5 N = 2 SD = 44.6	14.7 N = 3 SD = 21.6	13.4 N = 5 SD = 20.5
W. Indies	N = 0	32.0 N = 2 SD = 11.3	17.0 N = 1	5.3 N = 3 SD = 34.0
White	24.1 N = 13 SD = 20.5	20.9 N = 17 SD = 31.7	4.6 N = 13 SD = 17.7	20.8 N = 13 SD = 19.8

References

Alcock, J. (1993). Animal Behavior: An Evolutionary Approach. Sunderland, Massachusetts: Inauer Associates, Inc.

Allman, W. F. (1994). The Stone Age Present. New York: Simon & Schuster.

Aries, E. (1987). Gender and communication. In P. Shaver and C. Hendrick (Eds.), Sex and Gender (pp. 149-176). Newbury Park, California: Sage.

Averill, J. R. (1992). The structural bases of emotional behavior: A metatheoretical analysis. In M. S. Clark (Ed.), Review of Personality and Social Psychology , Vol. 13, Emotion, 1-24.

Averill, J. R. (1994a). In the eyes of the beholder. In P. Ekman and R. J. Davidson (Eds.), The Nature of Emotion (p. 7-14). New York: Oxford University Press.

Averill, J. R. (1994b). Emotions are many splendored things. In P. Ekman and R. J. Davidson (Eds.), The Nature of Emotion (p. 99-102). New York: Oxford University Press.

Averill, J. R., & Thomas-Knowles, C. (1991). Emotional creativity. In K. T. Strongman (Ed.) International Review of Studies on Emotion (vol. 1, pp. 269-299). New York: Wiley Press.

Axelrod, R. (1984). The evolution of cooperation. New York: Basic Books Publishers.

Axelrod, R., & Hamilton, W. D. (1981). The evolution of cooperation. Science, 211, 1390-1396.

Balling, J. D., & Falk, J. H. (1982). Development of visual preferences for natural environments. Environment and Behavior, 14(1), 5-28.

Barden, R. C., Zelko, F. A., Duncan, S. W., & Masters, J. C. (1980). Children's consensual knowledge about the experiential determinants of emotions. Journal of Personality and Social Psychology, 39, 968-976.

Baron, R. A. (1987). Interviewer's mood and reaction to job applicants. Journal of Applied Social Psychology, 17, 911-926.

Batson, C. D., Shaw, L. L., & Oleson, K. C. (1992). Differentiating affect, mood, and emotion: Toward functionally based conceptual distinctions. In M. S. Clark (Ed.), Review of Personality and Social Psychology, Vol. 13, Emotion, 294-326.

Belsky, J., Steinberg, L., & Draper, P. (1991). Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. Child Development, 62, 647-670.

Bem, D. J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. Psychological Review, 74, 183-200.

Bower, G. H., Montiero, K. P., & Gilligan, S. G. (1978). Emotional mood as a context for learning and recall. Journal of Verbal Learning and Verbal Behavior, 17, 573-587.

Brehm, J. W. (1999). The intensity of emotion. Personality and Social Psychology Review, 3(1), 2-22.

Broadbent, D. E. & Broadbent, M. (1988). Anxiety and attentional bias: State and trait. Cognition and Emotion, 2, 165-183.

Brody, L. R., Hall, J. A. (1993). Gender and emotion. In M. Lewis and J. M. Haviland (Eds.), Handbook of Emotions (pp. 447-461). New York: Guilford Press.

Buck, R. (1984). The Communication of Emotion. New York: The Guilford Press.

Buck, R. (1999). The biological affects: A typology. Psychological Review, 106, (2), 301-336.

Buss, D. M. (1989a). Conflict between the sexes: Strategic interference and the evocation of anger and upset. Journal of Personality and Social Psychology, 56(5), 735-747.

Buss, D. M. (1989b). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. Behavioral and Brain Sciences, 12, 1-49.

Buss, D. M. (1992). Mate preference mechanisms: Consequences for partner choice and intrasexual competition. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary psychology and the generation of culture (p. 249-266). New York: Oxford University Press.

Buss D. M. (1994). The Evolution of Desire. New York: Basic Books

Buss, D. M. (1999). Evolutionary Psychology: The New Science of the Mind. Boston: Allyn & Bacon Publishing.

Buss, D. M., Larsen, R. J., Westen, D., & Semmelroth, J. (1992). Sex differences in jealousy: Evolution, physiology, and psychology. Psychological Science, 3, 251-255.

Buss, D. M. & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. Psychological Review, 100(2), 204-232.

Buttery, R. G., Guadagni, D. G., Ling, L. C., Seifert, R. M., & Lipton, W. (1976). Additional volatile components of cabbage, broccoli, and cauliflower. Journal of Agricultural and Food Chemistry, 24, 829-832.

Buunk, A. P., Angleitner, A., Oubaid, V., & Buss, D. M. (1996). Sex differences in jealousy in evolutionary and cultural perspective: Tests from Netherlands, Germany, ad the United States. Psychological Science, 7, 359-363.

Cacioppo, J. T., & Berntson, G. G. (1994). Relationship between attitudes and evaluative space: A critical review, with emphasis on the separability of positive and negative substrates. Psychological Bulletin, 115, 401-423.

Cacioppo, J. T., & Berntson, G. G. (1999). The affect system: Architecture and operating characteristics. Current Directions in Psychological Science, 8(5), 133-137.

Cacioppo, J. T., Petty, R. E., Losch. M. E., & Kim, H. S. (1986). Electromyographic activity over facial muscle regions can differentiate the valence and intensity of affective reactions. Journal of Personality and Social Psychology, 18, 260-268.

Campbell, A. (1999). Staying alive: Evolution, culture, and women's intrasexual aggression. Behavioral and Brain Sciences, 22, 203-252.

Cannon, W. B. (1927). The James-Lange theory of emotion: A critical examination and an alternative theory. American Journal of Psychology, 39, 106-124.

Cannon, W. B. (1929). Bodily changes in pain, hunger, fear and rage. New York: Appleton Publishers.

Cannon, W. B. (1939). The wisdom of the body. New York: Norton Press.

Chomsky, N. (1975). The Logical Structure of Linguistic Theory. New York: Plenum Press.

Christianson, S. A. & Loftus, E. (1991). Remembering emotional events: The fate of detailed information. Cognition and Emotion, 5, 81-108.

Clark, R. D. & Hatfield, E. (1989). Gender differences in receptivity to sexual offers. Journal of Psychology and Human Sexuality, 2, 39-55.

Clore, G. L. (1992). Cognitive phenomenology: Feeling and the construction of judgment. In L. L. Martin & A. Tesser (Eds.), The Construction of Social Judgment, (133-163). Hillsdale, NJ: Erlbaum.

Clore, G. L. (1994a). Why emotions require cognition. In P. Ekman and R. J. Davidson (Eds.), The Nature of Emotion (p. 181-191). New York: Oxford University Press.

Clore, G. L.(1994b). Why emotions are felt. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 103-111). New York: Oxford University Press.

Clore, G. L.(1994c). Why emotions are never unconscious. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 285-290). New York: Oxford University Press.

Cosmides, L. (1989). The logic of social exchange: Has natural selection shaped how humans reason? Studies with the Wason selection task. Cognition, 31, 187-276.

Cosmides, L. & Tooby, J. (1992). Cognitive adaptations for social exchange. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary psychology and the generation of culture (pp. 163-228). New York: Oxford University Press.

Cunningham, M. R., Roberts, A. R., Wu, C-H., Barbee, A. P., & Druen, P. B. (1995). "Their ideas of beauty are, on the whole, the same as ours": Consistency and variability in the cross-cultural perception of female attractiveness. Journal of Personality and Social Psychology, 68, 261-279.

Daly, M. & Wilson, M. (1982). Whom are newborn babies said to resemble? Ethology and Sociobiology, 3, 69-78.

Daly, M. & Wilson, M. (1985). Child abuse and other risks of not living with both parents. Ethology and Sociobiology, 6, 197-210.

Daly, M. & Wilson, M. (1988). Evolutionary social psychology and family homicide. Science, 242, 519-524.

Daly, M. & Wilson, M. (1990). Killing and competition. Human Nature, 1, 83-109.

Daly, M. & Wilson, M. (1996). Evolutionary psychology and marital conflict. In D. M. Buss and N. M. Malamuth (Eds.) Sex, Power, and Conflict: Evolutionary and Feminist Perspectives (p. 9-28). New York: Oxford University Press.

Damasio, A. R. (1994). Descartes' Error: Emotion, Reason, and the Human Brain. New York: Grosset/Putnam Publishers.

Darwin, C. (1859/1998). The Origin of Species. Hertfordshire, England: Wordsworth Editions Limited Press. [Original publisher London: Murray Press.]

Darwin, C. (1871/1998). The Descent of Man. Amherst, New York: Prometheus Books Press. [Original publisher London: Murray Press.]

Darwin, C. (1872/1965). Expression of Emotion in Man and Animals. Chicago: University of Chicago Press. [Original publisher London: Murray Press.]

Davidson, R. J. (1993). The neuropsychology of emotion and affective style. In M. Lewis & J. Haviland (Eds.), The Handbook of Emotions (p. 143-154). New York: Guilford Press.

Davidson, R. J. (1994). On emotion, mood and related affective constructs. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 51-55). New York: Oxford University Press.

Dennett, D. C. (1995). Darwin's Dangerous Idea: Evolution and the Meaning of Life. New York: Touchstone Book, Simon & Schuster Publishing.

DeSteno, D. A., & Salovey, P. (1996). Evolutionary origins of sex differences in jealousy: Questioning the "fitness' of the model. Psychological Science, 7, 367-372.

De Waal, F. (1982). Chimpanzee Politics: Power and sex among the apes. Baltimore: John Hopkins Press.

De Waal, F. (1988). Chimpanzee politics. In R. W. Byrne & A. Whiten (Eds.), Machiavellian intelligence (p. 122-131). Oxford, England: Oxford University Press.

Diamond, J. (1992). The Third Chimpanzee. New York: Harper Press.

Dutton, D. G. & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. Journal of Personality and Social Psychology, 30, 510-517.

Eibl-Eibesfeldt, I. (1973). The expressive behavior of deaf-and-blind-born. In M. von Cranach and I. Vine (Eds.), Social communication and movement. New York: Academic Press.

Ekman, P. (1992). An argument for basic emotions. Cognition and Emotion, 6, 169-200.

Ekman, P. (1994). Moods, emotions, and traits. In P. Ekman and R. J. Davidson (Eds.), The Nature of Emotion (pp. 56-58). New York: Oxford University Press.

Ekman, P. & Friesen, W. V. (1971). Constants across culture in the face and emotion. Journal of Personality and Social Psychology, 17, 124-129.

Ekman, P., Levenson, R. W., & Friesen, W. V. (1983). Autonomic nervous system activity distinguishes among emotions. Science, 221, 1208-1210.

Ekman, P. Sorensen, E. R., & Friesen, W. V. (1969). Pan-cultural elements in facial displays of emotion. Science, 164, 86-88.

Ellis, B. J. (1992). The evolution of sexual attraction: Evaluative mechanisms in women. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary psychology and the generation of culture (pp. 267-288). New York: Oxford University Press.

Ellis, B. J., McFadyen-Ketchum, S., Dodge, K. A., Pettit, G. S., Bates, J. E. (1999). Quality of early family relationships and individual differences in the timing of pubertal maturation in girls: A longitudinal test of an evolutionary model. Journal of Personality and Social Psychology, 77(2), 387-401.

Ellsworth, P. C. (1994). Levels of thought and levels of emotion. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (pp. 192-196). New York: Oxford University Press.

Fisher, H. (1992). The Anatomy of Love: The Natural History of Monogamy, Adultery, and Divorce. New York: Norton Press.

Fiske, S. T. (1989). Examining the role of intent: Toward understanding its role in stereotyping and prejudice. In J.S. Uleman and J. A. Bargh (Eds.), Unintended Thought (pp. 253-283). New York: Guilford Press.

Forgas, J. P., & Moylan, S. (1987). After the movies: The effect of mood on social judgments. Personality and Social Psychology Bulletin, 13, 465-477.

Freud, S. & Breuer, J. (1895/1955). Studies on hysteria. In J. Strachey & A. Strachey (Eds.), The standard edition of the complete psychological works of Sigmund Freud. London: Hogarth Press.

Frey, K. S., & Ruble, D. N. (1987). What children say about classroom performance: Sex and grade differences in perceived competence. Child Development, 58, 1066-1078.

Frijda, N. H. (1986). The Emotions. Cambridge: Cambridge University Press.

Frijda, N. H. (1987). Emotion, cognitive structure, and action tendency. Cognition and Emotion, 1, 115-143.

Frijda, N. H. (1994). Varieties of affect: Emotions and episodes, moods, and sentiments. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 59-67). New York: Oxford University Press.

Geary, D. C. (1998). Male, Female: The evolution of human sex differences. Washington D. C.: American Psychological Association.

Gangestad, S. W., & Simpson, J. A. (1990). Toward an evolutionary history of female sociosexual variation. Journal of Personality, 58(1), 69-96.

Gould, R. J., & Sloane, C. G. (1982). The "feminine modesty" effect: A self-presentational interpretation of sex differences in causal attribution. Personality and Social Psychology Bulletin, 8, 477-485.

Gray, P. (1994). Psychology, 2nd ed. New York: Worth Publishing.

Hagen, E. H. (1999). The function of postpartum depression. Evolution and Human Behavior, 20(5), 325-359.

Haig, D. (1993). Genetic conflicts in human pregnancy. The Quarterly Review of Biology, 68, 495-532.

Hamilton, W. D. (1964). The genetic evolution of social behavior. Journal of Theoretical Biology, 7, 1-52.

Hatfield, E. & Rapson, R. L.(1993). Love, sex, and intimacy. New York: HarperCollins Press.

Hendrick, S. & Hendrick, C. (1992). Romantic Love. Newbury Park: Sage Press.

Ickes, W. (1987). Sex-role influence in dyadic interaction: A theoretical model. In M. R. Walsh (Ed.), The Psychology of Women (pp. 95-128). New Haven, Connecticut: Yale University Press.

Isen, A. M. (1993). Positive affect and decision making. In M. Lewis & J. Haviland (Eds.), The Handbook of Emotions (p. 261-277). New York: Guilford Press.

Izard, C. E. (1993). Four systems for emotion activation: cognitive and noncognitive processes. Psychological Review, 100, 68-90.

Izard, C. E. (1994). Cognition is one type of emotion activating systems. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 203-207). New York: Oxford University Press.

Jackson, L. A. (1992). Physical appearance and gender: Sociobiological and sociocultural perspectives. Albany: State University of New York Press.

James, W. (1890). Principles of Psychology. New York: Dover Publishing Inc.

Kagan, J. (1994). Distinctions among emotions, moods, and temperamental qualities. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 74-78). New York: Oxford University Press.

Kaplan, S. (1987). Aesthetics, affect, and cognition: Environmental preference from an evolutionary perspective. Environment and Behavior, 19(1), 3-32.

Kaplan, R. (1983). The role of nature in the urban context. In I. Altman & J. F. Wohlwill (Eds.), Behavior and natural environment, (p. 127-161). New York: Plenum Press.

Kaplan, S., & Kaplan, R. (1982). Cognition and environment: Functioning in an uncertain world. New York: Praeger Press.

Kemper, T. D. (1990). Social Structure and Testosterone. New Brunswick: Rutgers University Press.

Kenrick, D. T. (1995). Evolution and the confederacy of dunces. Psychological Inquiry, 6(1), 56-62.

Kenrick, D. T., Trost, M. R., & Sheets, V. L. (1996). Power, harassment, and trophy mates: The feminist advantages of an evolutionary perspective. In D. M. Buss and N. M. Malamuth (Eds.) Sex, Power, and Conflict: Evolutionary and feminist perspectives (p. 29-53). New York: Oxford University Press.

Laird, J. D. & Bresler, C. (1992). The process of emotional experience: A self-perception theory. In P. Shaver (Ed.), Review of Personality and Social Psychology, 14, 213-233.

Langlois, J. H., Roggman, L. A., & Reiser-Danner, L. A. (1990). Infants' differential social responses to attractive and unattractive faces. Developmental Psychology, 26, 153-159.

Lazarus, R. S. (1982). Thoughts on the relation between emotion and cognition. American Psychologist, 37, 1019-1024.

Lazarus, R. S. (1984). On the primacy of cognition. American Psychologist, 39, 124-129.

Lazarus, R. S. (1991a). Cognition and motivation in emotion. American Psychologist, 46, 352-367.

Lazarus, R. S. (1991b). Progress on a cognitive-motivational-relational theory of emotion. American Psychologist, 46, 819-834.

Lazarus, R. S. (1991c). Emotion and Adaptation. New York: Oxford University Press.

Lazarus, R. S. & Alfert, E. (1964). Short-circuiting of threat by experimentally altering cognitive appraisal. Journal of Abnormal and Social Psychology, 69, 195-205.

Lazarus, R. S. & Lazarus, B. N. (1994). Passion and Reason: Making sense of our emotions. New York: Oxford University Press.

LeDoux, J. E. (1993). Emotional networks in the brain. In M. Lewis & J. Haviland (Eds.), The Handbook of Emotions (p. 109-118). New York: Guilford Press.

LeDoux, J. E. (1994). Cognitive-emotional interactions in the brain. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p.216-223). New York: Oxford University Press.

LeDoux, J. E. (1994). Emotional processing, but not emotions, can occur unconsciously. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p.291-293). New York: Oxford University Press.

LeDoux, J. E. (1996). The Emotional Brain. New York: Simon & Schuster Publishing.

Levenson, R. W. (1994). Human emotion: A functional view. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p.123-126). New York: Oxford University Press.

Lewis, M. D. (1993). Emotion-cognition interactions in early infant development. Cognition and Emotion, 7, 145-170.

Linton, M. (1982). Transformations of memory in everyday life. In U. Neisser (Ed.), Memory Observed: Remembering in natural contexts (p. 77-91). San Francisco: Freeman Press. As cited in Oatley and Jenkins (1996).

Maccoby, E. E., & Jacklin, C. N . (1974). The Psychology of Sex Differences. California: Stanford University Press.

MacLean, P. D. (1993). Cerebral evolution of emotion. In M. Lewis & J. Haviland (Eds.), The Handbook of Emotions (p. 67- 85). New York: Guilford Press.

Mandler, (1975). Mind and Emotion. New York: Wiley Press.

Mandler, (1984). Mind and Body: Psychology of emotion and stress. New York: Norton Press.

Manning, A., & Dawkins, M. S. (1992). An Introduction to Animal Behavior. Cambridge University Press.

Marks, I. M. & Nesse, R. M. (1994). Fear and fitness: An evolutionary analysis of anxiety disorders. Ethology and Sociobiology, 15, 247-261.

Mathews, A., & Klug, F. (1993). Emotionality and interference with color-naming in anxiety. Behavior Research and Therapy, 29, 147-160.

Mayer, J. D. & Geher, G. (1996). Emotional intelligence and the identification of emotion. Intelligence, 22, 89-113.

Nasby, W., & Yondo, R. (1982). Selective encoding and retrieval of affectively valenced information. Journal of Personality and Social Psychology, 43, 1244-1255.

Nesse, R. M. (1990). Evolutionary explanation of emotions. Human Nature, 1(3), 261-289.

Nesse, R. M. (1991). What good is feeling bad: The evolutionary benefits of psychic pain. Science, 31, 30-37.

Nesse, R. M. & Barridge, K. C. (1997). Psychoactive drug use in evolutionary perspective. Science, 278, 63-66.

Nesse, R. M. & Lloyd, A. T. (1992). The evolution of psychodynamic mechanisms. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary psychology and the generation of culture (pp. 601-624). New York: Oxford University Press.

Nesse, R. M. & Williams, G. C. (1998). Evolution and the origins of disease. Scientific American, Feature Article: November 1998.

Oatley, K. (1992). Best Laid Schemes: The psychology of emotions. Paris: Cambridge University Press.

Oatley, K. (1993). Social construction in emotions. In M. Lewis & J. Haviland (Eds.), The Handbook of Emotions (p. 341-352). New York: Guilford Press.

Oatley, K. & Jenkins, J. M. (1996). Understanding Emotions. Cambridge MA: Blackwell Publishers.

Oatley, K., & Johnson-Laird, P. N. (1987). Towards a cognitive theory of emotions. Cognition and Emotion, 1, 29-50.

Ohman, A. (1992). Fear and anxiety as emotional phenomena: Clinical, phenomenological, evolutionary perspectives, and information-processing mechanisms.

In M. Lewis and J. M. Havilands, (Eds.), The Handbook of Emotions, (p. 511-536). New York: Guilford Press.

Orians, G. H. & Heerwagen, J. H. (1992). Evolved responses to landscapes. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary psychology and the generation of culture (pp. 555-580). New York: Oxford University Press.

Ortony, A. & Turner, T. J. (1990). What's basic about basic emotions? Psychological Review, 97, (3), 315-331.

Panksepp, J. (1993). Neurochemical control of moods and emotions: Amino acids to neuropeptides. In M. Lewis & J. Haviland (Eds.), The Handbook of Emotions (p. 87-107). New York: Guilford Press.

Panksepp, J. (1994). A proper distinction between affective and cognitive process is essential for neuroscientific progress. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 224-226). New York: Oxford University Press.

Plutchik, R. (1980). Emotion: A Psychoevolutionary Synthesis. New York: Harper & Row Publishers.

Plutchik, R. (1993). Emotions and their vicissitudes: Emotions and psychopathology. In M. Lewis & J. Haviland (Eds.), The Handbook of Emotions (p. 53-66). New York: Guilford Press.

Plutchik, R. (1994). The Psychology and Biology of Emotion. New York: HarperCollins College Publishers.

Profet, M. (1992). Pregnancy sickness as adaptation: A deterrent to maternal ingestion of teratogens. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary psychology and the generation of culture (pp. 327-366). New York: Oxford University Press.

Reisenzein, R. (1983). The Schachter theory of emotion: Two decades later. Psychological Bulletin, 94, p. 239-264.

Roseman, I. J. (1984). Cognitive determinants of emotion: A structural theory. In P. Shaver (Ed.), Review of Personality and Social Psychology, Vol. 5, Emotion, Health, and Stress, 11-36.

Russell, J. A. (1991). Culture and the categorization of emotion. Psychological Bulletin, 110, 426-450.

Russell, J. A., & Carroll, J. M. (1999). On the bipolarity of positive and negative affect. Psychological Bulletin, 125(1), 3-30.

Saarni, C. (1979). Children's understanding of display rules for expressive behavior. Developmental Psychology, 15, 424-429.

Saarni, C. (1982). Social and affective functions of nonverbal behavior. In R. W. Feldman (Ed.), Development of nonverbal behavior in children. New York: Springer Verlag Press.

Saarni, C. (1993). Socialization of emotion. In M. Lewis & J. Haviland (Eds.), The Handbook of Emotions (p. 435-446). New York: Guilford Press.

Schachter, S., & Singer, J. (1962). Cognitive, social and physiological determinants of emotional state. Psychological Review, 69, 379-399.

Scherer, K. R. (1984). Emotion as a multicomponent process: A model and some cross-cultural data. In P. Shaver (Ed.), Review of Personality and Social Psychology, 5, 37-63.

Scherer, K. P. (1994). Emotion serves to decouple stimulus and response. In P. Ekman and R. J. Davidson (Eds.), The Nature of Emotion (p. 127-130). New York: Oxford University Press.

Schwartz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. Journal of Personality and Social Psychology, 45, 513-523.

Singh, D. (1993). Adaptive significance of waist-to-hip ratio and female physical attractiveness. Journal of Personality and Social Psychology, 65, 293-307.

Singh, D., & Luis, S. (1995). Ethnic and gender consensus for the effect of waist-to-hip ratio on judgments of women's attractiveness. Human Nature, 6, 51-65.

Singh, D., & Young, R. K. (1995). Body weight, waist-to-hip ratio, breasts, and hips: Role in judgments of female attractiveness and desirability for relationships. Ethology and Sociobiology, 16, 483-507.

Small, M. F. (1993). Female Choice: Sexual behavior of female primates. Ithaca, NY: Cornell University Press.

Smuts, B. (1995). The evolutionary origins of patriarchy. Human Nature, 6(1), 1-32.

Smuts, B. (1996). Male aggression against women: An evolutionary perspective. In D. M. Buss and N. M. Malamuth (Eds.) Sex, Power, and Conflict: Evolutionary and feminist perspectives (p. 231-268). New York: Oxford University Press.

Spence, J. T., Helmreich, R. L., & Stapp, J. (1975). Rating of self and peers on sex-role attributes and their relations to self-esteem and conceptions of masculinity and femininity. Journal of Personality and Social Psychology, 32, 29-39.

Stroop, J. R. (1935). Studies of interferece in serial verbal reactions. Journal of Experimental Psychology, 18, 643-662.

Studd, M. V. (1996). Sexual harassment. In D. M. Buss and N. M. Malamuth (Eds.) Sex, Power, and Conflict: Evolutionary and feminist perspectives (p. 54-89). New York: Oxford University Press.

Susman, E. J., Innoft-Germain, J. G., Nottelmal, E. D., Loriaux, D. L., Cutler, Jr., G. B., Chrousos, G. P. (1987). Hormones, emotional dispositions, and aggressive attributes in young adolescents. Child Development, 58, 114-1134.

Symons, D. (1992). On the use and misuse of Darwinism in the study of human behavior. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary psychology and the generation of culture (pp. 137-159). New York: Oxford University Press.

Tannen, D. (1990). You Just Don't Understand: Men and Women in Conversation. New York: Morrow.

Teasdale, J. D., & Russell, M. L. (1983). Differential effects of induced mood on the recall of positive, negative and neutral words. British Journal of Clinical Psychology, 22, 163-171.

Tierson, F. D., Olsen, C. L., & Hook, E. B. (1986). Nausea and vomiting of pregnancy and association with pregnancy outcome. American Journal of Obstetrics and Gynecology, 155, 1017-1022.

Tomkins, S. S. (1982). Affect theory. In P. Ekman (Ed.), Emotion in the human face (2nd ed., pp. 353-395). Cambridge, England: Cambridge University Press.

Tooby, J. & Cosmides, L. (1990). The past explains the present: Emotional adaptations and the structure of ancestral environments. Ethology and Sociobiology, 11, 375-424.

Tooby, J. & Cosmides, L. (1992). The psychological foundations of culture. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary psychology and the generation of culture (pp. 19-136). New York: Oxford University Press.

Trivers, R. (1971). The evolution of reciprocal altruism. Quarterly Review of Biology, 46, 35-57.

Trivers, R. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), Sexual selection and the descent of man (p. 136-179). Chicago: Aldine-Atherton Press.

Trivers, R. (1974). Parent-offspring conflict. American Zoologist, 14, 249-267.

Waganaar, W. A. (1986). My memory: A study of autobiographical memory over six years. Cognitive Psychology, 18, 225-252.

Watson, D., & Clark, L. A. (1994a). Emotions, moods, traits, and temperaments: Conceptual distinctions and empirical findings. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 89-93). New York: Oxford University Press.

Watson, D., & Clark, L. A. (1994b). Distinguishing functional from dysfunctional affective responses. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 131-136). New York: Oxford University Press.

Wiederman, M. W., & Kendall, E. (1999). Evolution, sex, and jealousy: Investigation with a sample from Sweden. Evolution and Human Behavior, 20, 121-128.

Williams, G. C. (1966). Adaptation and Natural Selection. Princeton, New Jersey: Princeton University Press.

Wilson, M., & Daly, M. (1992). The man who mistook his wife for a chattel. In J. H. Barkow, L. Cosmides, and J. Tooby (Eds.), The Adapted Mind: Evolutionary Psychology and the Generation of Culture (p. 289-325). New York: Oxford University Press.

Yerushalmy, J., & Milkovich, L. (1965). Evaluation of the teratogenic effects of meclizine in man. American Journal of Obstetrics and Gynecology, 93, 553-562.

Yuille, J. C., & Cutshall, J. L. (1986). A case study of eyewitness testimony to a crime. Journal of Applied Psychology, 71, 291-301.

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. American Psychologist, 35, 151-175.

Zajonc, R. B. (1984). On the primacy of affect. In K. R. Scherer & P. Ekman (Eds.), Approaches to Emotion. Hillsdale, NJ: Lawrence Erlbaum Press.

Zajonc, R. B. (1994). Evidence for nonconscious emotions. In P. Ekman and R. J. Davidson (Eds.), Then Nature of Emotion (p. 293-297). New York: Oxford University Press.