

The Influence of Physical Attractiveness and Gender on Ultimatum Game Decisions

Sara J. Solnick

University of Miami

and

Maurice E. Schweitzer

University of Pennsylvania

Physical appearance influences behavior in a number of environments, yet surprisingly little is known about the influence of physical attractiveness on the bargaining process. We conducted an ultimatum game experiment to investigate the influence of physical attractiveness and gender on ultimatum game decisions. Results from this study revealed no significant differences in the offers or demands attractive and unattractive people made. However, attractive people and men were treated differently by others. Consistent with the notion of a “beauty premium,” attractive people were offered more, but more was demanded of them. Men were also offered more, and less was demanded of them. We discuss implications of these results with respect to bargaining and the labor market. © 1999 Academic Press

INTRODUCTION

For many goods and services market clearing prices are characterized by a “zone of indeterminacy” (Rees, 1993). In these cases, outcomes are influenced by both market forces and negotiations. Consequently, some people will pay more or receive less for the same goods and services. For example, similar job

We thank David Budescu, Colin Camerer, Jack Hershey, Abba Kreiger, Paul Rosenbaum, and Rachel Croson for helpful comments. We thank Kimberly Taylor for help recruiting subjects, and Stephane Mahuteau, Augustine Nelson, and Piero Monteverdi for research assistance. Finally, we thank the University of Miami Research Council for funding this project.

Address correspondence and reprint requests to Maurice Schweitzer, 1300 SH-DH, OPIM, Wharton School, University of Pennsylvania, Philadelphia, PA 19104. Fax: 215-898-3664. E-mail: maurice@grace.wharton.upenn.edu.

candidates may be offered different salaries to perform the same work. Some of these differences may result from individual differences in negotiation skill. Other differences however, may result from attributes or characteristics of the parties that influence the bargaining process. In this paper, we explore the influence of physical attractiveness and gender on bargaining behavior. Prior work has identified a “beauty premium,” “plainness penalty” (Hammermesh & Biddle, 1994) and a persistent gender gap (Goldin, 1990) in wages, but the cause of these differences is not fully understood. Previous work has not determined whether less attractive people and women demand less, are treated differently, or both. We disentangle these effects and explore the influence of physical appearance on bargaining in an experimental setting using the ultimatum game.

The ultimatum game is a stylized bargaining situation that has been used to examine a broad range of behaviors (see Thaler, 1988; Roth, 1995; and Camerer & Thaler, 1995, for a review). In its simplest form, one player, the Proposer, proposes an allocation of a fixed sum of money, and the second player, the Responder, either accepts or rejects the proposal. If the proposal is accepted, the money is divided according to the proposal. If the proposal is rejected, both players receive nothing.

The subgame-perfect equilibrium for this game is straightforward. Proposers should offer the smallest amount of money possible, and Responders should accept this (or any positive) amount. Actual outcomes, however, rarely match this theoretical solution. Proposers typically offer close to half of the total pie, and even these offers are rejected about 10% of the time. When Proposers offer 20% of the total pie, Responders reject this amount about 50% of the time (Camerer, 1999).

The ultimatum game can be played according to the game method or the strategy method. According to the game method, the Proposer makes an offer, and then the Responder observes this offer and decides whether to accept or reject the offer. If the Responder accepts the offer, the money is divided according to the proposal. If the Responder rejects the offer, both players earn nothing. According to the strategy method, both players make decisions simultaneously. The key difference is that the Responder records a minimum acceptable level prior to observing the Proposer’s offer. If the Proposer’s offer equals or exceeds the Responder’s minimum acceptable offer, the offer is accepted and the money is divided according to the proposal. Otherwise the offer is rejected and both players earn nothing.

We report results from an ultimatum game experiment that involved attractive and unattractive men and women. In the first stage of the experiment, 70 subjects made ultimatum decisions and were photographed. In the second stage, a panel of 20 judges rated the attractiveness of the photographed subjects. The most and least attractive men and women were then selected and randomly ordered into photo books. In the third stage, 108 subjects viewed the photographs and made ultimatum game decisions that were resolved by pairing their decisions with those of the photographed subjects.

This experimental environment enabled us to disentangle important aspects

of the bargaining process, but in some regards limited our investigation. For example, we used photographs rather than face-to-face encounters. This design enabled us to present consistent stimuli across subjects and eliminate communication, but also limited the richness of each interaction. Photographs are often used to study the effects of physical attractiveness (Snyder, Tanke, & Berscheid, 1977; Marlowe, Schneider, & Nelson, 1997), though photographs may amplify (Ambady & Rosenthal, 1993) or curtail (McCall, 1997) attractiveness effects.

Results from this study did not reveal significant differences in the decisions attractive and unattractive men and women made. However, we found significant differences in the way these groups were treated by other players. Attractive people and men were offered more, and less was demanded from unattractive people and men.

Gender Differences in Bargaining

Results from prior studies examining the effects of gender on bargaining have not been consistent (Ball & Cech, 1993). For example, in one study men and women negotiated with the same degree of contentiousness and achieved similar results (Pruitt, Carnevale, Forcey, & Van Slyck, 1986), while in another study men negotiated more effectively than women (King & Hinson, 1994). In a study involving preparation for a hypothetical job interview, men planned to make higher opening bids, to refuse higher salaries, and to settle for higher salaries than women (Kaman & Hartel, 1994). In a related study, MBA subjects conducted a salary negotiation with the experimenter's confederate (Stevens, Bavetta, & Gist, 1993). In this study women set lower goals and negotiated lower salaries. Gerhart and Rynes (1991) studied actual salary negotiations and found that while male and female MBA students were equally likely to negotiate their starting salaries, men obtained higher increases (4.3% for men versus 2.7% for women).

One shortcoming of these studies is the absence of controls for aspects such as human capital. Even when all subjects are business students, important gender differences in achievement and specialization can exist that lead to different labor market outcomes (Fuller & Schoenberger, 1991; Wood, Corcoran, & Courant, 1993). Women's lower opening bids and final negotiated salaries may have been caused by their legitimate belief that they were less qualified for a position or men's legitimate belief that they would work harder to justify a higher salary. In addition, subjects may set goals based on their knowledge of the salaries in their industry or on those earned by workers of the same gender. If so, these findings would merely reflect, rather than explain, the gender gap.

Gender differences have also been examined in a series of field studies involving car purchases (Ayres, 1991; 1995; Ayres & Siegelman, 1995). In these experiments black and white men and women were trained to use the same bargaining strategy at car dealerships. In these studies men, and in particular white men, received lower initial and final prices than women and blacks.

These studies suggest that physical appearance influences negotiator behavior and negotiated outcomes.

Physical Attractiveness and Labor Markets

Several studies have identified distinct economic advantages to being attractive (Dion, Berscheid, & Walster, 1972; Eagly, Ashmore, Makhijani, & Longo, 1991; Hatfield & Sprecher, 1986). In particular, attractive people generally fare better in the labor market. Several studies have demonstrated that attractive people are more likely to be hired (Bardack & McAndrew, 1985; Marlowe, Schneider, & Nelson, 1996; Morrow, 1990; Raza & Carpenter, 1987) and are more likely to be promoted (Jackson, 1981; Marlowe, Schneider, & Nelson, 1996; Ross & Ferris, 1983). In an exploratory study involving job candidates and recruiters, Rynes and Gerhart (1990) found that physical appearance significantly factored into recruiters' assessments of a candidate's "fit" within an organization. In a related study involving personnel professionals and information packets (with photographs), Morrow, McElroy, Stamper, and Wilson (1990) found that attractive candidates were more likely to be recommended for promotion.

Attractive people are also likely to earn higher salaries. Frieze, Olson, and Russell (1991) rated the attractiveness of MBA graduates from their graduate school picture books and found that attractiveness was correlated with income. Attractive men earned higher starting and subsequent salaries than unattractive men, and while attractive women did not earn higher starting salaries than unattractive women, they tended to earn higher salaries later in life. Two related studies examined the relationship between attractiveness and income for people drawn from the general population. In a study of Canadians, Roszell, Kennedy, and Grabb (1989) found that attractive men earned more than unattractive men, but that attractiveness did not influence the salaries of women. In a study of Americans and Canadians, Hamermesh and Biddle (1994) divided their sample population into attractive, average, and unattractive people. They found that attractive people earned about 4% more than average-looking people and that unattractive people earned about 7% less than average-looking people. Consistent with prior work, they found a stronger relationship between attractiveness and income for men.

There are some cases, however, where physical attractiveness may be a liability (Heilman, 1983). For example, Heilman and Saruwatari (1979) found that unattractive women were rated as more suitable than attractive women for a stereotypically male job.

The Ultimatum Game

The ultimatum game is an abstract representation of a bargaining problem. Although the normative solution to the game is simple, most people choose actions that differ significantly from the game theoretic solution. In fact, most people offer and reject substantial amounts of money (see Camerer, 1999).

The choices people make in this game have the potential to reveal important differences in preferences and expectations that impact actual transactions.

Several studies have identified individual differences in ultimatum game choices. For example, ultimatum game decisions differ across cultures (Roth, Prasnikar, Okuno-Fujiwara, & Zamir, 1991) and may even differ across fields of study. Kahneman, Knetsch, and Thaler (1986a, 1986b) found significant differences between the decisions of psychology students and those of commerce students, and Carter and Irons (1991) found that economics majors made decisions that were closest to the normative solution. Kagel, Kim, and Moser (1992) however, found no differences in ultimatum game decisions by field of study.

A few studies have identified gender differences in ultimatum game decisions. In a study of children's decision making Murnighan and Saxon (1994) found that girls made more generous offers than boys. In a high stakes ultimatum game study with adults, Slonim and Roth (1995) found that men were less likely to reject offers.

Other gender differences have also been described by studies designed to investigate these differences. In one study, Eckel and Grossman (1994) found that both men and women made similar offers and in both cases offered more to men. They also found that men were more likely to reject offers than women were, and that both men and women were more likely to accept offers from women. They interpret these results in terms of norms of fairness. In a second study, Solnick (1997) also found that both men and women made similar offers, and offered more to men. In this study however, men and women were less likely to accept offers from women.

Physical attractiveness, however, is likely to be an important moderator of individual differences in ultimatum game decisions. Prior work suggests that physical attractiveness impacts economic markets, but little is known about how physical attractiveness influences the bargaining process.

HYPOTHESES

Prior work has demonstrated that attractive people fare better in labor markets. Attractive people are more likely to be hired, earn higher salaries, and are more likely to be promoted. In part, higher productivity levels may explain these findings. In some professions, such as sales, attractive people are more successful than unattractive people (DeShields, Kara, & Kaynak, 1996). Attractive people, however, are favored even when their productivity levels are identical to those of less attractive people (Morrow, McElroy, Stamper, & Wilson, 1990). In this experiment we expect attractive people to be offered more than unattractive people, even though there are no productivity issues, no expectations, and no contact between subjects.

H1: Offers to attractive people will be greater than offers to unattractive people.

Attractive people enjoy a number of advantages (Eagly, Ashmore, Makhijani & Longo, 1991), and may become accustomed to being offered more than

others. Consequently, they may expect and demand more than unattractive people.

H2: Attractive people will demand more than unattractive people.

For similar reasons, offers to men are likely to be greater than offers to women, and men are likely to set higher demands. In many cases, men earn higher salaries and set higher aspirations than women in negotiations (Stevens, Baretta, & Gist, 1993; Kaman & Hartel, 1994). Prior ultimatum game studies have also found that men are offered more than women (Eckel & Grossman, 1994; Solnick, 1997).

H3: Offers to men will be greater than offers to women.

H4: Men will demand more than women.

We also predict an interaction between attractiveness and gender. In labor markets, men benefit more than women from being attractive (Frieze, Olson, & Russell, 1991; Hamermesh & Biddle, 1994; Roszell, Kennedy, & Grabb, 1989). These norms may translate to ultimatum game behavior, and the offers to and demands of attractive men may be particularly extreme.

H5: The difference between offers to attractive and offers to unattractive men will be larger than the difference between offers to attractive and unattractive women.

H6: The difference between demands made by attractive and unattractive men will be larger than the difference between demands made by attractive and unattractive women.

By matching offers with minimum acceptance levels we can compute rejection rates and expected earnings. These rates and amounts will vary as a function of both sets of decisions, and may produce complicated patterns. For example, low offers and high demands will contribute to high rejection rates and low earnings, but low offers and low demands may contribute to moderate rejection rates and high earnings. The exact relationship involves a set of interactions that is difficult to forecast, and consequently we do not make predictions over rejection rates and expected earnings.

METHODS

This study involved three experimental stages. First, we recruited 70 undergraduate students. In this group, 60% of the subjects were female and the average subject's age was 23. These subjects made \$10 ultimatum decisions as both Proposers and Responders. They were told that one of their decisions would be selected and matched with the ultimatum decision of a subject from a previous experiment. (See Appendix A for the ultimatum game instructions and Appendix B for a sample decision form.) After making their decisions, but prior to discovering their outcome, all subjects agreed to be photographed. They received class credit for participating and were paid based on a random match between one of their ultimatum game decisions and a decision made by another subject from a prior experiment. Twenty-one of the subjects received no payment, and 49 subjects received an average payment of \$5.02. We refer to this group of 70 subjects as the photographed subjects.

In the second stage of the study, 20 raters from a second university judged each of the 70 photographs. We used an 11-point scale ranging from -5 (Very Unattractive) to $+5$ (Very Attractive) on a form such as the one in Appendix C. Nine of the raters were female. Each rater viewed the photographs in a different random order. The photographs were randomized within gender; half of the raters viewed photographs of women first and half viewed photographs of men first. We used these ratings to select the six most attractive men, the six least attractive men, the six most attractive women and the six least attractive women. We refer to this group of 24 subjects as the selected photographed subjects.

In the third stage of the study we randomly and differently ordered the photographs of the 24 selected photographed subjects. We recruited a nonoverlapping sample of 108 subjects from the second university and asked 78 subjects to assume the role of the Proposer (Phase 3 Proposers) and 30 subjects to assume to the role of the Responder (Phase 3 Responders). We told Phase 3 subjects that 24 students from another university had already made their decisions for the opposite role. We then asked Phase 3 subjects to examine each photograph and record their decision on a decision form. The Phase 3 Proposers made offers to each photograph, and the Phase 3 Responders specified minimum acceptance levels for each photograph. Both sets of phase 3 subjects received outcome feedback after each of the 24 rounds. Phase 3 Proposers learned whether or not their offer was accepted, and Phase 3 Responders learned what they had been offered. At the conclusion of the experiment one of the 24 rounds was selected at random and subjects were paid based upon the outcome for that round. On average, Phase 3 subjects earned \$3.84.

RESULTS

We present results from this study in three parts. First, we describe the interrater reliability of the raters. Second, we describe the ultimatum game decisions of the photographed and Phase 3 subjects. Third, we match the ultimatum game decision of the Phase 3 and selected photographed subjects and discuss outcomes in terms of rejection rates and expected earnings.

Attractiveness Ratings

Twenty raters evaluated each of the 70 photographs. We found no significant differences across ratings as a function of presentation order (whether male or female photos were presented first) or gender of the rater. In a repeated measures analysis of variance neither presentation order ($F(1, 17) = 0.01$, $p = .93$) nor rater gender ($F(1, 17) = 0.65$, $p = .43$) was significant. Consequently we combined ratings. Our interrater reliability was very high and ranged from .83 to .99 (James, Demaree, & Wolf, 1984). For 99% of the photographs reliability exceeded .90.

From these ratings we selected 24 photographs to represent the most and least attractive men and women. The average ratings for the most attractive

TABLE 1
Average Ultimatum Game Offers of Photographed Subjects

	Most attractive	Least attractive	Other subjects	All subjects
Male	\$4.50 (0.55) <i>n</i> = 6	\$4.67 (1.50) <i>n</i> = 6	\$4.19 (0.91) <i>n</i> = 16	\$4.36 (0.99) <i>n</i> = 28
Female	\$4.67 (1.37) <i>n</i> = 6	\$3.50 (1.05) <i>n</i> = 6	\$4.28 (1.08) <i>n</i> = 30	\$4.23 (1.14) <i>n</i> = 42
All	\$4.58 (1.00) <i>n</i> = 12	\$4.08 (1.38) <i>n</i> = 12	\$4.25 (1.02) <i>n</i> = 46	\$4.28 (1.08) <i>n</i> = 70

Note. All photographed subjects made both Proposer and Responder ultimatum game decisions. This table reports the average offers, standard deviations of offers, and sample sizes for different groups of photographed subjects.

men and women were 1.22 and 2.01, and the average ratings for the least attractive men and women were -1.71 and -2.15 . We conducted an analysis of variance on these ratings, and found that the average rating of the 12 most attractive people was significantly higher than the average rating of the 12 least attractive people, $F(1, 20) = 266.54$, $p < .001$, but we did not find a significant difference between the average ratings of the men and women, $F(1, 20) = 3.01$, $p = .10$.

Ultimatum Decisions

We found no differences between the ultimatum game decisions made by different types of photographed subjects. As Tables 1 and 2 describe, attractive and unattractive men and women made similar offers and specified similar minimum acceptable levels. We computed a composite measure of attractiveness by normalizing and averaging attractiveness ratings across raters. We then used these attractiveness measures in two regression models. In the first model, each photographed subject's offer was the dependent variable and gender, attractiveness score and an interaction term were independent variables. In the second model, each photographed subject's minimum acceptable

TABLE 2
Average Ultimatum Game Minimum Acceptance Levels of Photographed Subjects

	Most attractive	Least attractive	Other	All subjects
Male	\$3.83 (1.94) <i>n</i> = 6	\$3.83 (1.83) <i>n</i> = 6	\$4.31 (1.14) <i>n</i> = 16	\$4.11 (1.45) <i>n</i> = 28
Female	\$4.25 (0.99) <i>n</i> = 6	\$4.33 (1.37) <i>n</i> = 6	\$3.87 (1.14) <i>n</i> = 30	\$3.99 (1.14) <i>n</i> = 42
All	\$4.04 (1.48) <i>n</i> = 12	\$4.08 (1.56) <i>n</i> = 12	\$4.02 (1.14) <i>n</i> = 46	\$4.04 (1.26) <i>n</i> = 70

Note. All photographed subjects made both Proposer and Responder ultimatum game decisions. This table reports the average minimum acceptance levels, standard deviations of minimum acceptance levels, and sample sizes for different groups of photographed subjects.

TABLE 3
Average Ultimatum Game Offers of Phase 3 Proposers to Selected Photographed Subjects

Selected photographed subjects	Phase 3 proposers		
	Male (<i>n</i> = 43)	Female (<i>n</i> = 35)	Both (<i>n</i> = 78)
Unattractive men	\$4.72	\$4.70	\$4.71
Attractive men	\$4.79	\$5.07	\$4.92
All men	\$4.76	\$4.88	\$4.81
Unattractive women	\$4.44	\$4.60	\$4.51
Attractive women	\$4.48	\$4.60	\$4.53
All women	\$4.46	\$4.60	\$4.52
Unattractive subjects	\$4.58	\$4.65	\$4.61
Attractive subjects	\$4.63	\$4.83	\$4.72
All selected subjects	\$4.61	\$4.74	\$4.67

level was the dependent variable and gender, attractiveness score and an interaction term were the independent variables. In both cases the parameter estimates were not significant, the models were not significant ($F(3, 66) = 1.17, p = .33$ and $F(3, 66) = 0.69, p = .56$, respectively), and the model fits were poor (adjusted $R^2 = 0.01$ and -0.01 , respectively). These results do not support Hypotheses 2, 4, and 6.

We next consider the ultimatum game decisions of the 108 Phase 3 subjects. Seventy-eight Phase 3 subjects made decisions as the Proposer, and 30 Phase 3 subjects made decisions as the Responder. We report average offers and average minimum acceptable levels in Tables 3 and 4.

We used analysis of variance to examine the decisions Phase 3 subjects

TABLE 4
Average Ultimatum Game Minimum Acceptable Levels of Phase 3 Responders for Selected Photographed Subjects

Selected photographed subjects	Phase 3 responders		
	Male (<i>n</i> = 20)	Female (<i>n</i> = 10)	Both (<i>n</i> = 30)
Unattractive men	\$3.14	\$3.52	\$3.26
Attractive men	\$3.17	\$3.77	\$3.37
All men	\$3.15	\$3.64	\$3.32
Unattractive women	\$3.28	\$3.53	\$3.37
Attractive women	\$3.57	\$3.92	\$3.69
All women	\$3.43	\$3.72	\$3.52
Unattractive subjects	\$3.21	\$3.52	\$3.32
Attractive subjects	\$3.37	\$3.84	\$3.53
All selected subjects	\$3.29	\$3.68	\$3.42

made.¹ We examined differences across the four types of selected photographed subjects: attractive males, unattractive males, attractive females, and unattractive females. In addition, we examined differences between the decisions male and female Phase 3 subjects made.

We first analyzed Phase 3 Proposers' offers. On average, more was offered to attractive subjects than unattractive subjects (\$4.72 versus \$4.61) and more was offered to men than women (\$4.81 versus \$4.52). From analysis of variance, we found that offers were significantly higher to attractive Responders ($F(1, 1771) = 5.52, p < .05$) and to male Responders ($F(1, 1771) = 35.38, p < .0001$). These results support Hypotheses 1 and 3. The interaction between gender and attractiveness was not significant ($F(1, 1771) = 3.65, p = .06$), and we do not find support for Hypothesis 5. We next examined the influence of the gender of the Proposer, and found that women made higher offers than men ($F(1, 1771) = 7.64, p < .01$).

Across rounds, average offer amounts remained fairly constant, but the variance of offers declined. Average offers for the first 5 rounds and last 5 rounds (4.64 and 4.67, respectively) were not significantly different, and average offers for the first 12 rounds and last 12 rounds (4.63 and 4.70, respectively) were not significantly different. The standard deviation of offers in the first 5 rounds was significantly higher than the standard deviation of offers in the last 5 rounds (1.44 and 1.07, respectively, with $p < .001$). Similarly, the standard deviation of offers in the first 12 rounds was significantly higher than the standard deviation of offers in the last 12 rounds (1.34 and 1.11, respectively, with $p < .001$).

We conducted similar analysis to examine the Phase 3 Responder decisions, and report average minimum acceptance levels in Table 4. On average, Phase 3 Responder subjects specified higher minimum acceptance levels for women than for men (\$3.52 versus \$3.32) and higher minimum acceptance levels for attractive people than unattractive people (\$3.53 versus \$3.32). As before, we report results from analysis of variance. We examined the effects of attractiveness and gender of the photographed subjects and the effects of gender of the Phase 3 Responders. We found that minimum acceptance levels were significantly lower for male photographed subjects ($F(1, 667) = 7.74, p < .01$) and higher for attractive photographed subjects ($F(1, 667) = 7.94, p < .01$). We found no significant interaction between the two ($F(1, 667) = 2.01, p = .16$). We also found that female Phase 3 Responders specified higher minimum acceptance levels than did male Responders ($F(1, 667) = 24.11, p < .001$).

Suggesting that subjects learn across rounds, average minimum acceptance offers fell significantly. Comparing the first 5 decision with the last 5 decisions, and the first 12 with the last 12 decisions, average levels fell from \$3.86 to \$3.15 ($p < .001$), and \$3.61 to \$3.23 ($p < .001$). Even in the last round, however,

¹ There are several alternative methods for analyzing this type of repeated measures data (see Everitt, 1995). In this paper we report results from ANOVA, though we also conducted repeated measures MANOVA and obtained similar results.

average minimum acceptance levels remained well above zero, the Responder's dominant strategy. Standard deviations remained constant across rounds. The standard deviations for the first 5, last 5, first 12, and last 12 decisions were 1.32, 1.22, 1.29, and 1.28, respectively (none of these differences were significantly different from each other).

Rejection Rates and Earnings

We calculated expected rejection rates and expected earnings by matching the decisions of the Phase 3 subjects with the decisions of the selected photographed subjects. For example, one photographed subject specified a minimum acceptance level of \$2.50. To calculate her expected earnings, we compared this amount with the offers she received from the Phase 3 subjects. In this case, she "rejected" three offers that were below \$2.50, earning \$0 for those rounds, and "accepted" 75 offers earning between \$3 and \$8. Overall, her rejection rate was 3.8% and her average expected earnings were \$4.60. We report average expected earnings for the selected photographed subjects in Table 5. We highlight differences and report results from Chi-square and *t* tests in this section.

Differences in rejection rates reflect the same trends we identified in ultimatum game decisions. For example, Phase 3 Proposers made higher offers to attractive and male selected photographed subjects, and consequently rejection rates were significantly lower for these offers; rejection rates were 22% versus 30.5% for attractive and unattractive selected photographed subjects, and 21.5% versus 31% for male and female selected photographed subjects, $p < .001$ in both cases.

Similarly, since male Phase 3 Responders specified lower minimum acceptance levels, they received offers lower than their acceptance level less often than female Phase 3 Responders, and faced rejection less often (18% versus 24%, respectively, $p < .05$). In addition, Phase 3 Responders were less likely to reject offers from male selected photographed subjects than from female

TABLE 5
Average Expected Earnings for Selected Photographed Subjects

Selected photographed subjects	Expected earnings of selected photographed subjects	
	As proposers (across 30 rounds)	As responders (across 78 rounds)
Unattractive men	\$4.28	\$3.85
Attractive men	\$4.79	\$4.25
All men	\$4.54	\$4.05
Unattractive women	\$3.96	\$3.23
Attractive women	\$4.08	\$3.70
All women	\$4.02	\$3.46
Unattractive subjects	\$4.12	\$3.54
Attractive subjects	\$4.44	\$3.97
All selected subjects	\$4.28	\$3.75

selected photographed subjects (14% versus 26%, respectively, $p < .001$). Phase 3 Responders were also more likely to reject the offers of unattractive selected photographed subjects than attractive subjects (25.5% versus 14.5%, respectively, $p < .001$). This difference was particularly pronounced when the offer came from a female photographed subject ($p < .001$).

These differences in offers, acceptance levels, and rejection rates resulted in substantial differences in expected earnings of the photographed subjects. If the selected photographed subjects had been paid based on the offers made by the Phase 3 Proposers, attractive subjects would have earned significantly more than unattractive subjects (\$3.97 versus \$3.54 on average, $p < .001$). In addition, male subjects would have earned more than female subjects (\$4.05 versus \$3.46 on average, $p < .001$). If the selected photographed subjects had been paid based on the demands made by the Phase 3 Responders, attractive subjects would have earned slightly more than unattractive subjects (\$4.44 versus 4.12 on average, $p = .06$), and men would have earned more than women (\$4.54 versus \$4.02 on average, $p < .01$). In both cases, when the selected photographed subjects were either Proposers or Responders, attractive males would have earned the most and unattractive women would have earned the least.

DISCUSSION

The ultimatum game is an abstract bargaining context with broad application. The game is free from the influence past relationships, qualifications, or future expectations might exert and designed to disentangle dynamics of the bargaining process. We examined the influence of physical appearance on the bargaining process and found interesting patterns in the demands and offers people made based upon their own and other's physical appearance.

In this study we found that one's own attractiveness did not influence decision making, but did influence the decision process of others. In particular, we found that more was offered to attractive people and to men, even though attractive people and men did not demand more. In this study the expected earnings of attractive people were 8 to 12% greater than the expected earnings of unattractive people, and the expected earnings of men were 13 to 17% greater than the expected earnings of women.

These findings are consistent with the "beauty premium" and persistent gender gap in the labor market. Attractive people and men earn more, but prior work has been unable to disentangle whether these populations are offered more, demand more or both. Results from this work suggest that attractive people and men receive more largely because they are offered more.

The relationship between attractiveness and bargaining decisions is complicated by the finding that subjects also demanded more from attractive people. This result suggests that the benefits of physical attractiveness may be context dependent. People may be both more generous to and more demanding of attractive people. This implication is consistent with Heilman's (1983) finding that attractiveness may be a liability for certain types of jobs.

Further work remains in exploring the relationship between physical appearance and bargaining behavior. This relationship is likely to be moderated by both contextual and individual factors. One important difference between the ultimatum games we conducted and more complex bargaining contexts is the role of communication. The communication process will influence the types of offers and demands negotiators make, and consequently diminish the influence of physical appearance on bargaining behavior. Other aspects of negotiations may also mitigate the influence of physical appearance, such as team negotiations and repeated negotiations. For example, in repeated negotiations disputants will develop relationships and may be more likely to focus on individual characteristics other than physical appearance.

Several individual factors are also likely to influence the extent to which physical appearance influences behavior. At the individual level, factors such as age and cultural orientation may exacerbate the effects of physical appearance on bargaining behavior. For example, individuals from male dominated cultures may be even more sensitive to gender differences than our results suggest. On the other hand, negotiation experience may mitigate these differences.

In this study we found that physical appearance significantly influenced the types of offers and demands negotiators made. These results have important implications for negotiations and suggest several directions for future work. For example, appearance may be an important factor to consider in the selection process for negotiation agents and negotiation teams. Important questions remain, however, with respect to the influence contextual and individual factors exert in moderating the relationship between appearance and bargaining behavior.

APPENDIX A: ULTIMATUM GAME INSTRUCTIONS

How the Game Is Played

Two players will decide how to divide \$10. Player 1 proposes a division of the \$10. At the same time, Player 2 decides the minimum amount he or she will accept. The players make their decisions separately, without knowing what the other is doing.

If Player 2 is willing to accept the amount offered by Player 1, the money will be split according to Player 1's proposal. If Player 2 is not willing to accept the amount offered by Player 1, both players will get nothing.

For example, suppose we divide \$750.

Suppose Player 1 proposes the following:

Of the \$750, I allocate \$ 500 for myself.

Of the \$750, I allocate \$ 250 for Player 2.

Total \$ 750.00

1. Suppose Player 2 wrote:

As Player 2, I would reject any amount less than \$ 100.

In this case, Player 1 offered Player 2, \$250, which is *more* than \$100, the amount Player 2 would reject. **Result:** Player 1 gets \$500 and Player 2 gets \$250.

2. Now suppose Player 2 wrote:

As Player 2, I would reject any amount less than \$ 250.

In this case, Player 1 offered Player 2, \$250, which is *the smallest amount* Player 2 would accept. **Result:** Player 1 gets \$500 and Player 2 gets \$250.

3. Finally, suppose Player 2 wrote:

As Player 2, I would reject any amount less than \$ 300.

In this case, Player 1 offered Player 2, \$250, which is *less* than \$300, the amount Player 2 would reject. **Result:** Player 1 gets \$0 and Player 2 gets \$0.

APPENDIX B: ULTIMATUM GAME RESPONSE SHEET

Game Sheet

I.D. Number: _____

Player 1:

Of the \$10.00, I allocate \$ _____ for myself.

Of the \$10.00, I allocate \$ _____ for Player 2.

Total \$ 10.00

Player 2:

As Player 2, I would reject any amount less than \$ _____

(This amount must be less than or equal to \$10.00.)

Your age: _____

Your gender (check one): Male Female

Your race (check one): Caucasian African-American

Asian Other (please specify): _____

Hispanic? (check one): Yes No

APPENDIX C: EXAMPLE RATING SHEET

Please examine the photographs in the book and judge how attractive these people are. We are interested in your opinions and there are no right or wrong answers. Circle one number for how attractive each person is.

	<i>Very attractive</i>					<i>Very unattractive</i>					
155	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
170	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
124	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
144	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

	Very attractive						Very unattractive					
102	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
174	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
131	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
143	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
134	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
116	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
113	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
106	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
119	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
114	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
105	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
171	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
163	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
167	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
135	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
129	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
152	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
161	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
139	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	
104	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	

REFERENCES

- Ambady, N., & Rosenthal, R. (1993). Half a minute: Predicting teacher evaluations from thin slices of nonverbal behavior and physical attractiveness. *Journal of Personality and Social Psychology*, **64**, 431–441.
- Ayres, I. (1991). Fair driving: Gender and race discrimination in retail car negotiations. *Harvard Law Review*, **104**, 817–872.
- Ayres, I. (1995). Further evidence of discrimination in new car negotiations and estimates of its cause. *Michigan Law Review*, **94**, 109–147.
- Ayres, I., & Siegelman, P. (1995). Race and gender discrimination in bargaining for a new car. *American Economic Review*, **85**, 304–321.
- Ball, S. B., & Cech, P. (1993). *Subject pool choice and treatment effects in economic laboratory research*. Unpublished working paper, Virginia Polytechnic Institute.
- Bardack, N., & McAndrew, F. (1985). The influence of physical attractiveness and manner of dress on success in a simulated personnel decision. *Journal of Social Psychology*, **125**, 777–778.
- Camerer, C. (1999). *The psychology of strategic thinking*. Working paper, Caltech University.
- Camerer, C. & Thaler, R. (1995). Anomalies: Ultimatums, dictators, and manners. *Journal of Economic Perspectives*, **9**, 209–219.
- Carter, J., & Irons, M. (1991). Are economists different, and if so, why? *Journal of Economic Perspectives*, **5**, 171–177.
- DeShields, O., Kara, A., & Kaynak, E. (1996). Source effects in purchase decisions: The impact of physical attractiveness and accent of salesperson. *International Journal of Research in Marketing*, **13**, 89–101.
- Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, **24**, 285–290.
- Eagly, A. H., Ashmore, R. D., Makhijani, M. G., & Longo, L. C. (1991). What is beautiful is good, but. . . A meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin*, **110**, 109–128.

- Eckel, C. C., & Grossman, P. (1994). *Chivalry and solidarity in ultimatum games*. Unpublished working paper, Virginia Polytechnic Institute.
- Everitt, B. S. (1995). The analysis of repeated measures: A practical review with examples. *The Statistician*, **1**, 113–135.
- Frieze, I., H., Olson, J. E., & Russell, J. (1991). Attractiveness and income for men and women in management. *Journal of Applied Social Psychology*, **21**, 1039–1057.
- Fuller, R., & Schoenberger, R. (1991). The gender salary gap: Do academic achievement, internship experience, and college major make a difference? *Social Science Quarterly*, **72**, 715–726.
- Gerhart, B., & Rynes, S. (1991). Determinants and consequences of salary negotiations by male and female MBA graduates. *Journal of Applied Psychology*, **76**, 256–262.
- Goldin, C. (1990). *Understanding the gender gap*. New York: Oxford Univ. Press.
- Hamermesh, D. S., & Biddle, J. E. (1994). Beauty and the labor market. *American Economic Review*, **84**, 1174–1194.
- Hatfield, E., & Sprecher, S. (1986). *Mirror, mirror. . . : The importance of looks in everyday life*. Albany: State Univ. of New York Press.
- Heilman, M. E. (1983). Sex bias in work settings: The lack of fit model. *Research in Organizational Behavior*, **5**, 269–298.
- Heilman, M., & Saruwatari, L. (1979). When beauty is beastly: The effects of appearance and sex on evaluations of job applicants for managerial and nonmanagerial jobs. *Organizational Behavior and Human Performance*, **23**, 360–372.
- Jackson, L. A. (1983). Gender, physical attractiveness, and sex roles in occupational treatment discrimination: The influence of trait and role assumption. *Journal of Applied Social Psychology*, **13**, 443–458.
- James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology*, **69**, 85–98.
- Kagel, J., Kim, C., & Moser, D. (1992). *Ultimatum games with asymmetric information and asymmetric payoffs*. Mimeo, University of Pittsburgh.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1986a). Fairness and the assumptions of economics. *Journal of Business*, **59**, S285–S300.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1986b). Fairness as a constraint on profit-seeking: Entitlements in the market. *American Economic Review*, **76**, 728–741.
- Kaman, V. S., & Hartel, C. E. (1994). Gender differences in anticipated pay negotiation strategies and outcomes. *Journal of Business and Psychology*, **9**, 183–197.
- King, W. C., & Hinson, T. D. (1994). The influence of sex and equity sensitivity on relationship preferences, assessment of opponent, and outcomes in a negotiation experiment. *Journal of Management*, **20**, 605–624.
- Marlowe, C. M., Schneider, S. L., & Nelson, C. E. (1996). Gender and attractiveness biases in hiring decisions: Are more experienced managers less biased? *Journal of Applied Psychology*, **81**, 11–21.
- McCall, M. (1997). Physical attractiveness and access to alcohol: What is beautiful does not get carded. *Journal of Applied Social Psychology*, **27**, 453–462.
- Morrow, P. (1990). Physical attractiveness and selection decision making. *Journal of Management*, **16**, 45–60.
- Morrow, P., McElroy, J., Stamper, B., & Wilson, M. (1990). The effects of physical attractiveness and other demographic characteristics on promotion decisions. *Journal of Management*, **16**, 723–736.
- Murnighan, J. K., & Saxon, M. S. (1994). *Ultimatum bargaining by children and adults*. Unpublished working paper, University of British Columbia Faculty of Commerce.
- Pruitt, D. G., Carnevale, P., Forcey, B., & Van Slyck, M. (1986). Gender effects in negotiation: Constituent surveillance and contentious behavior. *Journal of Experimental Social Psychology*, **22**, 264–275.

- Raza, S. M., & Carpenter, B. N. (1987). A model of hiring decisions in real employment interviews. *Journal of Applied Psychology*, **72**, 596–603.
- Rees, A. (1993). The role of fairness in wage determination. *Journal of Labor Economics*, **11**, 243–52.
- Ross, J., & Ferris, K. R. (1981). Interpersonal attraction and organizational outcomes: A field examination. *Administrative Science Quarterly*, **26**, 617–632.
- Roszell, P., Kennedy, D., & Grabb, E. (1989). Physical attractiveness and income attainment among Canadians. *Journal of Psychology*, **123**, 547–559.
- Roth, A. E. (1995). Bargaining experiments. In J. Kagel & A. E. Roth (Eds.) *Handbook of experimental economics*. Princeton, NJ: Princeton Univ. Press.
- Roth, A. E., Prasnikar, V., Okuno-Fujiwara, M., & Zamir, S. (1991). Bargaining and market behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An experimental study. *American Economic Review*, **81**, 1068–1095.
- Rynes, S., & Gerhart, B. (1990). Interviewer assessments of applicant 'fit': An exploratory investigation. *Personnel Psychology*, **43**, 13–34.
- Slonim, R., & Roth, A. (1995). *Financial incentives and learning in ultimatum games*. Unpublished working paper, State University of New York at Stony Brook.
- Snyder, M., Tanke, E. D., & Berscheid, E. (1977). Social perception and interpersonal behavior: On the self-fulfilling nature of social stereotypes. *Journal of Personality and Social Psychology*, **35**, 656–666.
- Solnick, S. J. (1997). *Gender differences in the ultimatum game*. Unpublished working paper, University of Miami.
- Stevens, C. K., Bavetta, A. G., & Gist, M. E. (1993). Gender differences in the acquisition of salary negotiation skills: The role of goals, self-efficacy and perceived control. *Journal of Applied Psychology*, **78**, 723–735.
- Thaler, R. H. (1988). The ultimatum game. *Journal of Economic Perspectives*, **2**, 191–202.
- Wood, R. G., Corcoran, M. E., & Courant, P. N. (1993). Pay differences among the highly paid: The male–female earnings gap in lawyer's salaries. *Journal of Labor Economics*, **11**, 417–441.