DISCRIMINATION IN A SEGMENTED SOCIETY: AN EXPERIMENTAL APPROACH*

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This paper proposes an experimental approach to studying different aspects of discrimination. We let participants play various games with opponents of distinct ethnic affiliation. Strategies based upon such ethnic affiliation provide direct evidence of ethnic discrimination. This approach was utilized to study ethnic discrimination in Israeli Jewish society. Using the "trust game," we detected a systematic mistrust toward men of Eastern origin. A "dictator game" experiment indicated that this discrimination was due to (mistaken) ethnic stereotypes and not to a "taste for discrimination." The "ultimatum game" enabled us to trace another ethnic stereotype that reversed the discrimination's direction. One of the surprising results is that this ethnic discrimination is an entirely male phenomenon.

I. INTRODUCTION

Ethnic discrimination, like any other type of discrimination, can be the outcome of a "taste for discrimination" or the result of ethnic stereotypes. A taste for discrimination describes a situation wherein individuals are willing to sacrifice money, wages, or profits in order to cater to their prejudice (see Becker [1957, 1993]). In this case, the prejudice is already part of the utility function and may reflect some dislike, anger, or similar emotions toward a certain group of people. Ethnic stereotypes, on the other hand, are a simplified and standardized perception of a person or a group commonly held by people.[1] This perception may affect the interaction between individuals as it may affect the beliefs regarding the plausible actions or abilities of members of certain groups. Stereotypes are not one-dimensional as they may involve beliefs pertaining to various types of characteristics and abilities. Some stereotypes may be statistically correct while others may be totally mistaken.

Empirical evidence of discrimination in different societies

1. Clearly, there are situations in which the two types of prejudices are closely related, and the ethnic stereotype leads to preferences with a taste for discrimination.

has been extensively discussed in the literature.[2] However, while these studies are useful in providing evidence for discrimination in different markets, they are less so when it comes to explaining the type of discrimination identified. In this paper we propose an experimental approach to studying the different aspects of discrimination. In these experiments, individuals played a variety of games against players of different ethnic groups. We subsequently examined how the ethnic affiliation of game partners affected the strategy chosen by the players. The outcome of these experiments may clarify the following questions.

  (i) Is there discrimination (differential treatment) based on ethnic affiliation?

 (ii) Does the discrimination reflect a group bias in that each player favors players of his own group, or is there a systematic discrimination against one, or several, ethnic groups?

(iii) Is this discrimination based on a taste for discrimination, or is it the outcome of ethnic stereotyping that affects the players' assessment regarding their game partners' strategic responses or relevant characteristics?

(iv) Are the ethnic stereotypes accurate?

This experimental approach was used to examine ethnic discrimination within Israeli Jewish society.[3] The latter is characterized by an ethnic structure based primarily on country of origin. The two major ethnic groups are Ashkenazic Jews (European and American immigrants and their Israeli-born offspring) and Eastern Jews (Asian and African immigrants and their Israeli-born offspring). There are persistent economic gaps between the two ethnic segments. Ashkenazic immigrants achieve higher levels of education and earnings than do Eastern immigrants, and these gaps continue to prevail among second-generation immigrants (see Cohen and Haberfeld [1998], Eisenstadt [1985],

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2. There is ample literature on audit studies showing direct evidence of discrimination in employment, housing, and credit (see, for example, Fix and Struyk [1993] as well as discussion and references on the subject in Altonji and Blank [1999] and Neumark [1996]). See also the recent special Symposium issue on Discrimination in Product, Credit, and Labor Markets that appeared in the *Journal of Economic Perspectives* [1998] and the following papers in this symposium: Yinger [1998], Ladd [1998], Darity and Mason [1998], Arrow [1998], Heckman [1998], and Loury [1998].

3. A clearly significant and heated segmentation in Israeli society is that between Arabs and Jews, but we reserve this issue for future research. Another major segmentation in Israeli Jewish society is the one between secular and Orthodox Jews.

Mark [1994], Semyonov and Kraus [1983], Semyonov and Lerenthal [1991], and Shavit [1984]).

In order to address question (i), we first conducted an experiment with the "trust game" (see Berg, Dickhaut, and McCabe [1995]). We started by examining trust since we believe that economic interactions are not governed solely by contractual agreements and that trust between individuals plays an important role in facilitating efficient activities. As Arrow [1972] pointed out, "virtually every commercial transaction has within itself an element of trust." The trust game is a two-player game in which Player A is given a fixed amount of money and asked to decide whether to transfer any of it to Player B, and if so how much. The experimenter then triples the amount and gives it to Player B who is asked to choose whether to transfer any money back to Player A. In such a game, gains are obtainable through cooperation. The game is labeled a trust game as the amount that Player A transfers to Player B serves as an indication of his trust in his game partner or of the two players' ability to cooperate. The efficient outcome, which maximizes the total pie, would require Player A to transfer *all* of his resources to Player B (as these resources would then be tripled). The subgame perfect equilibrium, on the other hand, implies *no* transfers and thus does not exploit the potential gains deriving from transfer. Berg, Dickhaut, and McCabe [1995] found that typically, Player A transferred a positive amount of money to Player B, who often returned an even larger amount.[4]

Our trust game experiment indicates that the segmented structure of Israeli society indeed manifests itself in a consistent pattern of discrimination and mistrust. The amount of money transferred to players of Eastern origin was significantly *lower* than that transferred to players of Ashkenazic origin.

With regard to question (ii), we found no evidence for a group bias. The systematic mistrust of players of Eastern origin was common not only among Ashkenazic players, but also among Eastern players who themselves discriminate against players from their own group.

Discrimination in the trust game, however, does not necessarily indicate mistrust, as it could be the outcome of a taste for

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4. A similar procedure was used by Camerer and Weigelt [1988], Fehr, Kirchsteiger, and Riedl [1993], Fehr, Gachter, and Kirchsteiger [1997], Guth, Ockenfels, and Wendel [1994], and McKelvey and Palfrey [1992].

discrimination (see question (iii)). The lower amounts transferred to players of Eastern origin could be a reflection of prejudice stemming from the players' preferences rather than from ethnic stereotypes with respect to trust.[5] We therefore conducted a second experiment in which the trust game was played while omitting the game's second stage. This is a one-stage game in which Player A decides on a division of the amount of money given to him between himself and Player B (the experimenter automatically tripled any amount transferred to Player B). This game is known as the "dictator game." Player B in this game does not have any strategic role, and thus ethnic stereotypes, which may provide signals regarding his strategic behavior during the second stage of the game, have no bearing on this game. Therefore, any transfer distribution differences in the dictator game must be due to a taste for discrimination. We conducted the dictator game experiment in the same fashion and with the same population as that used for the trust game. Although the transfer distributions to Eastern and Ashkenazic players were somewhat different in this experiment, on average, the two groups received similar transfers. Thus, by comparing the transfers in the trust game with those of the dictator game, we can conclude that ethnic discrimination in the trust game is indeed the outcome of ethnic stereotypes rather than a reflection of a "taste for discrimination."[6]

The discrimination that we identified in the trust and ultimatum games may have a market-based explanation if, indeed, players of different ethnic background play these games differently. In this case, the players' ethnic affiliation provides a valuable signal regarding their future choice of action. This type of discrimination is denoted in the literature as "statistical discrimination" (see Arrow [1973, 1998]). In order to check for statistical discrimination in our experiments, we examined the responses of students who played the role of Player B in both the trust and ultimatum games. We found no evidence for such statistical discrimination. The strategic choice of players of different ethnic

5. Note, however, that this explanation is less likely in this case, as we found no difference in the behavior of Ashkenazic and Eastern players.
6. It is interesting to contrast the results reported in this paper with experiments that we conducted concerning the relationship between secular and religious Jews in Israel [Fershtman and Gneezy 2000]. In this experiment the transfers of secular players to religious partners were lower than the transfers to secular players both in the trust and dictator games. Thus, in this case, there is a taste for discrimination.

backgrounds was not statistically different. This observation, however, does not rule out rational behavior. Players may have misperceptions regarding the behavior of players from different ethnic groups, and this misperception may rationally lead to a different strategy choice. We may thus conclude that while ethnic discrimination in the trust game in Israeli society is based on ethnic stereotypes, these are largely mistaken stereotypes.

Trust is not the only ethnic stereotype that can be studied by means of experiments. By changing the game again, we were able to trace another type of ethnic stereotype. In the third experiment reported in this paper, once again, we changed the last stage of the game such that Player B's role consisted of just saying "yes" or "no" to Player A's proposal. If Player B chose "yes," the proposal was implemented; otherwise both got zero payoffs. This game is known as the "ultimatum game" and has been extensively discussed in the experimental economics literature.[7] The common result in the ultimatum game experiment is that the proposer (Player A) typically transfers a nonnegligible amount to the responder (Player B) who occasionally rejects low offers. The nonnegligible transfer by the proposers can be partially explained by their wish to achieve a more equitable division of funds, but also by their belief that the responder may reject "unfair" divisions. Our findings showed that the direction of the discrimination identified in the trust game was *reversed* in the ultimatum game. Players of Eastern origin received *larger* transfers than players of Ashkenazic origin. This result may reflect a familiar ethnic stereotype in Israel whereby people of Eastern ethnic background tend to be more driven by a sense of "honor" or to react harshly when treated unfairly. Given such ethnic stereotypes, players tend to be more careful with proposing low offers to players of Eastern origin for fear that such offers may be rejected.

The discrimination pattern may depend not only on ethnic affiliation but also on gender. We were surprised to find that the ethnic discrimination pattern identified in the trust game was a primarily male phenomenon. Women in the trust game experiment transferred similar amounts of money to partners of Eastern or Ashkenazic background, and there was no evidence of ethnic discrimination between women.[8] Thus, the ethnic discrimi-

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7. See the original experiment by Guth, Schmittberger, and Schwarze [1982] and the surveys in Camerer and Thaler [1995], Guth [1995], and Roth [1995].
8. Gender-dependent behavior comparisons have a long tradition in the social

nation identified in our trust game experiment was only apparent with respect *to* and *by* male players.

II. A Short Background of Eastern and Ashkenazic Ethnic Groups in Israel

When the State of Israel was established in 1948, there were 600,000 Jews in Israel, primarily of Ashkenazic origin. From 1948 to 1952 the country's Jewish population more than doubled as a result of a massive immigration of 700,000 Jews. About half of these immigrants were Ashkenazic (Holocaust survivors); the other half consisted of Eastern Jews. Immigration continued after 1952, but at a slower pace. However, 55 percent of the immigrants during the slow period were Eastern Jews. The ethnic division between the immigrants changed dramatically in the 1990s with the massive immigration of Jews from the former Soviet Union.

The persistent social and economic gaps between the two ethnic groups have been the subject of extensive research (e.g., Amir [1987], Cohen and Haberfeld [1998], Haberfeld [1992], Mark [1994], Semyonov and Kraus [1983], and Semyonov and Lerenthal [1991]). These studies' main finding is that the gaps have not been bridged over time. Moreover, the (education and earning) gaps between second-generation immigrants are no smaller than those identified among first-generation immigrants. In these studies, the earning gaps are mainly attributed to schooling gaps, and not to discrimination in the labor market. An examination of several descriptive statistics of second-generation Jewish immigrants in Israel (see Cohen and Haberfeld [1998]) reveals that in 1992, for instance, the percentage of men of Ashkenazic origin with a college degree (or higher) was 41.4 percent while for men of Eastern origin, the figure was 11.1 percent (the corresponding percentages for women were very similar). The mean annual earning of men of Eastern origin that year was only 67.7 percent of that of Ashkenazic men (among women, the gap was about 20 percent).

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sciences. See, for example, Bolton and Katok [1995], Andreoni and Vesterlund [2001], Croson and Buchan [1999], and Eckel and Grossman [1997], and for a recent survey of this literature, Eckel and Grossman [1998]. This literature's main finding is that men are more selfish than women. These findings, however, are far less conclusive and appear to depend heavily on the context of the study.

III. Trust and Cooperation

Intuition suggests that the degree of trust between individuals may play an important role in society's development and economic success. Indeed, in a multicountry comparison, Knack and Keefer [1997] showed that trust was associated with stronger economic performance. These findings are not surprising if one thinks of the role of trust in promoting business, partnerships between firms, joint research ventures, etc.

We have adopted Berg, Dickhaut, and McCabe's [1995] trust game experiment in order to examine trust between different ethnic groups in Israel. At the first stage of this two-player game, Player A receives a fixed amount of money that he needs to allocate between himself and Player B. The experimenter triples the amount transferred to Player B, and, at the second stage, Player B decides how much of this amount to transfer back to Player A.

Experimental Procedure

The participants in this experiment consisted of 966 Israeli undergraduates. All participants were selected from large (at least 70 students per class) mandatory courses. The first group of players consisted of students from the University of Haifa and the Academic College of Tel Aviv. Using name lists, we chose students from this group with typical ethnic names:[9] 122 Ashkenazic male names, 135 Eastern male names, 118 Ashkenazic female names and 108 Eastern female names (483 in total).[10] These students played the role of Player B. The second group of players consisted of undergraduates from Tel Aviv University. These students, recruited in their classes, played the role of Player A. In order to ensure against bias, students were randomly matched, and the same experimenter conducted all sessions.

The instructions are presented in Appendix 1. The students who assumed the role of Player A were told that the experiment was being conducted in pairs and that they had already been matched with another student from another university. The name of the person with whom they were matched was written (in ink) at the bottom of the sheet of paper they received.

9. Many of the family names in Israel provide a good indication of ethnic affiliation, a fact well recognized by most of the population.
10. See Holm [2000] for an experimental procedure using names to signal gender.

Player A was then told that (s)he would receive NIS 20[11] and that his/her partner (Player B) would not receive any money. Player A was asked to decide whether (s)he wanted to transfer any portion of the NIS 20 to Player B, and if so, how much. The players were told that the amount transferred would automatically be tripled and that Player B, with whom they were matched, would be informed within a few days about all details pertaining to the game, including the amount that Player A transferred to him/her. Player B would then be asked to decide whether (s)he wanted to send any portion of the money (s)he received back to Player A. The students were told that this last transfer would conclude the experiment and that we would come to their classes one week later to pay them. Player A students were then asked to write down their names and the amount they wanted to transfer to Player B.

In the second stage of the experiment, we approached the students from the University of Haifa and the Academic College of Tel Aviv in their classes. We told them that we had used the list of names of course participants and that only some of the students were needed for the experiment (although they were not informed of the rule used to select the names). The names were then called out loud, and the forms handed to the respective students. The students assuming the role of Player B were provided with exactly the same description of the experiment. They were also informed of the names of Player A with whom they were matched as well as of the sum (s)he had decided to forward them. Once they decided upon the amount they wished to return, they were paid confidentially and in cash.

After making his/her choice, each participant was asked to fill out a questionnaire. The questions we were most interested in were the participant's gender and the birthplace of his/her parents. These types of questions are not uncommon in official forms in Israel. Table I presents the number of pairs that were matched according to gender and ethnicity.[12]

It should be emphasized that in our procedure, each participant was aware of the name of the person with whom (s)he was matched and that the participants' decisions were revealed to the experimenter at the end of the experiment. This procedure is contrary to

11. At the time of the experiment, $1 = NIS 3.6.
12. We placed all the students we were unable to classify as Ashkenazic or Eastern in the group labeled "Israel" (for example, students with parents from both groups).

TABLE I

PARTICIPATING PAIRS IN THE TRUST GAME ACCORDING TO GENDER AND ETHNICITY

		Player A					
		Israeli male	Ashkenazic male	Eastern male	Israeli female	Ashkenazic female	Eastern female	Total
P **L** **A** **Y** **E** **R** **B**	Ashkenazic male	31	23	15	23	16	14	122
	Eastern male	27	28	18	28	17	17	135
	Ashkenazic female	22	22	21	23	14	16	118
	Eastern female	27	14	18	21	15	13	108
	Total	107	87	72	95	62	60	483

that of Berg, Dickhaut, and McCabe [1995], who used a double anonymity procedure to ensure that no one aside from the participant himself/herself would be aware of his/her decision.

Segmented Society

Our first task was to verify the casual observation whereby Israeli society is indeed segmented along ethnic lines, not only with respect to customs and culture but, more importantly, also with respect to trust. Figure I describes the distribution of money transfers by Player A to males playing the role of Player B according to the ethnic identity of Player B. (As evidenced later on, trust is dependent upon gender as well as ethnic affiliation.) The dark and light columns, respectively, illustrate the distribution of transfers when Player A was matched with a game partner with a typically Eastern (or, respectively, Ashkenazic) name. The difference between the two distributions was striking. In particular, almost 60 percent of the students chose the efficient transfer (transferring the whole pie) when their opponent was of Ashkenazic origin, but only 20 percent did so when they faced an opponent of Eastern origin. Figure I tells us the whole (sad) story of social segmentation in Israeli society.

Observation 1: Israeli society is (strongly) segmented. In the trust game the average transfer to an Ashkenazic male partner was 15.15 whereas the average amount transferred to an Eastern male partner was 8.06 (or about 53 percent of the average trans-
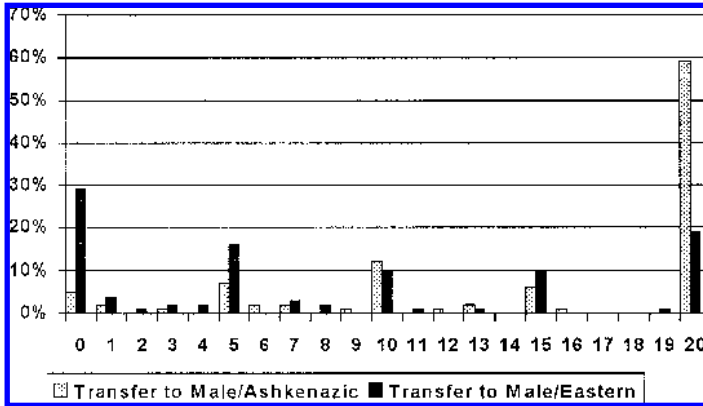
FIGURE I
Transfer to Male Players in the Trust Game

fer to Ashkenazic male partners). A two-way variance analysis reveals that this difference is significant [$F(1, 256) = 61.64$, $P < .00$].[13]

Our analysis indicates that ethnic discrimination is gender-reliant. Section VI will focus on the gender aspect. In the interim, our discussion will be restricted to games in which both players are men. Figure II illustrates the distribution of money transfers (in the trust game) to Player B depending on his ethnic affiliation when both players A and B are men.

The average transfer by male players to Eastern male players was 5.62, whereas the average sum that men transferred to Ashkenazic male players was 17.16. In other words, the average transfer to Ashkenazic male players was about three times that of the amount transferred to Eastern male players. The difference between the numbers is significant [$F(1, 140) = 101.3$, $P < .00$]. It is also noteworthy that close to 80 percent of the men transferred the full NIS20 and achieved the efficient outcome when they played with an Ashkenazic male player, whereas this number dropped to 12 percent when they played with an Eastern male partner.

13. The text reports the ANOVA test results. Although this is the standard analysis, some of its assumptions (such as the normality assumption) are problematic with regard to our data. For this reason, we have also reported, in the Appendix, the results of the nonparametric Mann-Whitney *U*-test based on rank. We wish to emphasize that, with our data, the results of the two tests were similar in all cases.
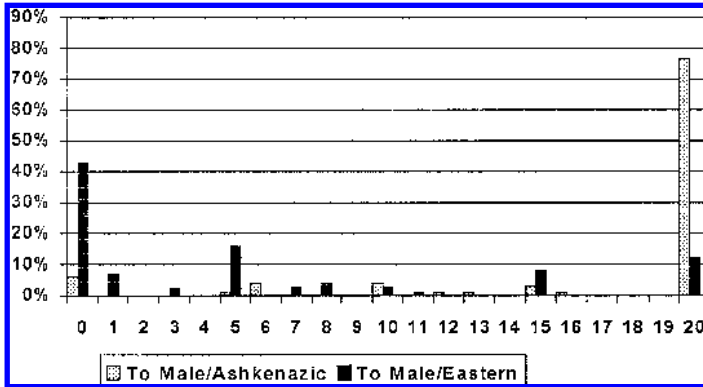
FIGURE II

Transfer from Male to Male/Ashkenazic and Male/Eastern in the Trust Game

Trust among Segments: Systematic Discrimination

The results presented in the previous subsections do not necessarily imply the existence of *systematic discrimination* against a particular ethnic group. Previous studies have shown that even an arbitrary group affiliation may affect the way people treat others.[14] Group bias implies that people treat members of their own group more favorably than they treat other people. Thus, it is possible that discrimination in the trust game merely reflects group bias. If players place greater trust in members of their own ethnic group and if there were more Ashkenazic students in the studied population, the outcome whereby students of Ashkenazic origin received greater money transfers is not surprising.

In order to check for systematic discrimination against one particular ethnic group, we asked the students (after they had played the game) to fill out a short questionnaire that included a question pertaining to their parents' country of birth.[15] Given this information, we were able to distinguish between the different ethnic groups of students who participated in the experiment. The population of male students who took on the role of Player A

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14. See Tajfel [1982], Tajfel and Turner [1979], Taylor and Moghaddam [1987], and Turner, Brown, and Tajfel [1979].

15. Providing ethnic affiliation is not viewed as an unusual request in many forms that a typical Israeli student has to fill out throughout his/her years of study.
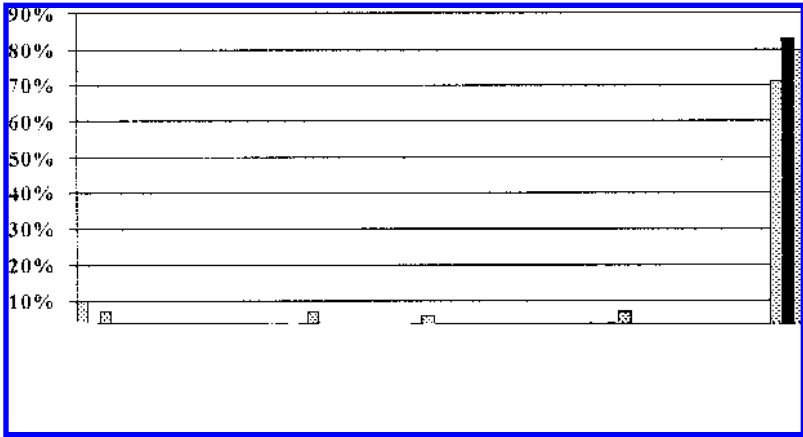
FIGURE IIIa
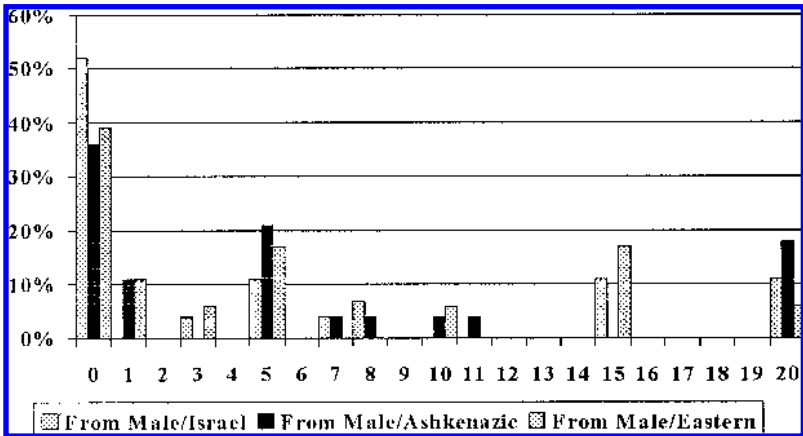Transfer to Male/Ashkenazic by Males According to Origin in the Trust Game

FIGURE IIIb
Transfer to Male/Eastern by Males According to Origin in the Trust Game

was divided into three groups: Ashkenazic, Eastern, and "Israeli." The latter group also includes students with one parent of Eastern origin and one of Ashkenazic origin. Figures IIIa and IIIb summarize the findings.

Figures IIIa and IIIb show that the pattern of mistrust toward male players of Eastern origin is common to *all* types of (male) players, regardless of their ethnic affiliation. The average transfer of Eastern, Ashkenazic, and Israeli male players to Ash-

TABLE II
Average Amount Returned by Males According to Ethnic Background and
the Amount they Received from Player A

Amount given by Player A	5	10	15	20
Average returned by Ashkenazic male	1.8	13	17.2	24.3
Average returned by Eastern male	2.8	14.2	16.7	23.1

kenazic male players was 17.4, 18.43, and 16.1, respectively. We found no statistically significant difference between these transfers. The average transfer to Eastern male players was 5.28, 6.04, and 5.41, respectively. Again, we found no statistically significant difference between the transfers.

Observation 2: *A systematic mistrust* in men of Eastern origin was found to be common among men of all ethnic origins. In particular, this pattern of mistrust *also* characterizes men of Eastern origin, who discriminate against members of their own group.

This paper does not provide any explanation for Observation 2. It appears to us, however, that as part of a cycle of prejudice and discrimination, and as a reaction to their inferior status in society, Eastern Jews have come to believe in these stereotypes of themselves.

Is Discrimination in the Trust Game Rational?

A possible explanation of the discrimination identified in our experiment is that people of different ethnic background indeed respond differently when they play the role of Player B. In such a case, ethnic discrimination may be rational when based on relevant statistical differences between the groups. In order to test for such statistical discrimination in the trust game, we examined the amounts that Player B transferred back to Player A. Clearly, Player B's decision regarding the amount he transfers to Player A depends on the amount transferred to him/her in the first place. Thus, this comparison can only be established with regard to students who received the same amount from Player A. Table II illustrates the average amounts returned by male students of different origins who received NIS 5, 10, 15, or 20.

In order to statistically compare the distribution of amounts

returned by male students of different origins, four different comparisons using the Mann-Whitney *U*-test were made, based on the amount Player A received (NIS 5, 10, 15, or 20). The hypothesis whereby the distribution of transfers from Player B back to Player A does not depend on Player B's ethnic background cannot be rejected for all four comparisons at a .5 level of significance.

Observation 3: We found no evidence for statistical discrimination in the trust game. That is, we found no evidence that an Eastern male player sent back an amount that differed significantly from that returned by an Ashkenazic male player.

Although we found no evidence for statistical discrimination, the discrimination that we identified does not necessarily contradict rational behavior. Players may have misperceptions regarding the behavior of players from different ethnic groups, and this misperception may rationally lead to a different strategy choice. We do not, however, label such discrimination as "statistical" since by so doing, any discrimination based on stereotypes rather than on preferences could be labeled as statistical discrimination.

IV. Taste for Discrimination: Dictator Game

Ethnic discrimination is not necessarily the result of ethnic stereotypes. People may harbor anger, dislike, or other emotions toward members of another ethnic group. In this case, prejudice is already a part of the players' emotional makeup. The ethnic discrimination that we identified in the trust game is therefore not necessarily a reflection of ethnic mistrust; i.e., it could simply be the result of the above-mentioned taste for discrimination. In order to distinguish between ethnic stereotype and a taste for discrimination, we conducted a second experiment in which we let the students play the dictator game.

The dictator game is a two-player game in which, at the beginning of the game, Player A gets a fixed amount of money that he is asked to divide between himself and Player B, and the division suggested by Player A is carried out. In order to render this game compatible with the previous trust game, we adopted the rule whereby any amount transferred from Player A to Player B would automatically be tripled by the experimenters. Since, in this game, Player B is a passive player devoid of any strategic role, any ethnic stereotypes pertaining to potential strategy choices by Player B offer no relevant information. Thus, if we should find that in the dictator game the amounts transferred to

Player B were affected by his ethnic background, this would be a strong indication for the existence of a taste for discrimination.

The subgame perfect equilibrium of the dictator game is that Player A does not transfer money to Player B. However, this equilibrium is based on defining the players' preferences as maximizing monetary payoffs. Numerous experiments, however, indicated that when playing the dictator game, players transfer a nonnegligible amount to Player B (see Roth [1995] for a survey). This transfer reflects the player's wish for an equitable division of the resources provided in the experiment.[16]

Dictator Game: Experimental Procedure

The participants in this experiment consisted of 616 Israeli undergraduates. At the preliminary stage of the experiment, we chose students from the University of Haifa and the Tel Aviv Academic College with typical ethnic names. We chose 77 names from each of the four relevant ethnic/gender groups.

The experiment consisted of one stage in which we approached the students from Tel Aviv University, who played the role of Player A, and asked them to split the twenty points between themselves and Player B.[17] Table III illustrates the number of couples matched according to gender and ethnicity.

Dictator Game: Results

Figure IV illustrates the distribution of transfers (points) by Player A (male players at Tel-Aviv University) to Player B (male players at Haifa University) according to the ethnic background of Player B. Note that most of the transfers amounted to either zero, five, or ten points. In other words, Player A chose either to allocate points equally, to allocate money equally, or to exploit their dictator position in order to keep the money for themselves. The average transfer was 5.6 to Eastern male players and 5.1 to male Ashkenazic players. While the average transfers were similar, a close examination of the distribution of transfers points to an interesting difference. A larger share of the Eastern players received the five-point transfer whereas a greater portion of the Ashkenazic players received either zero or ten-point transfers.

In order to test whether the difference between the distribu-

16. Clearly, the meaning of "equitable division" may vary across people and cultures.
17. The instructions given to Player A in this experiment are available from the authors upon request.

TABLE III
PARTICIPATING PAIRS IN THE DICTATOR GAME ACCORDING TO GENDER
AND ETHNICITY

		Player A					
		Israeli male	Ashkenazic male	Eastern male	Israeli female	Ashkenazic female	Eastern female	Total
P L A Y E R B	Ashkenazic male	22	12	10	17	11	5	77
	Eastern male	24	14	9	14	9	7	77
	Ashkenazic female	15	16	10	19	8	9	77
	Eastern female	22	13	13	13	10	6	77
	Total	83	55	42	63	38	27	308

tions is statistically significant, we used the likelihood ratio test (see Davidson and Mackinnon [1993], or the use of the test in Stahl [1996] and Camerer and Ho [1999]). We used as modes of behavior the choice of 0, 5, 10, or random choice. We took the maximum likelihood parameters of population 1 (Ashkenazic males) and imposed them on population 2 (Eastern males). The resulting likelihood is the restricted model likelihood. In contrast, the maximum likelihood of population 2 without the imposition of parameters is the unrestricted likelihood. Twice the difference
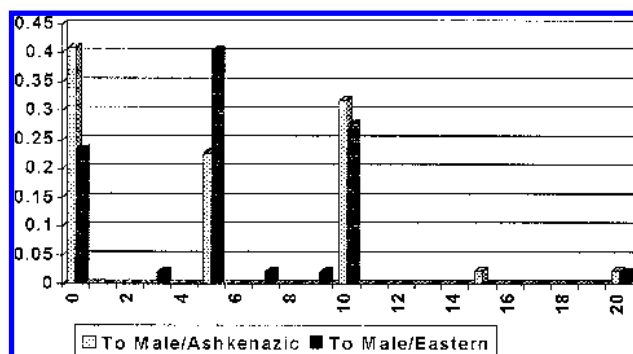

FIGURE IV
Transfer by Males to Males According to Origin in the Dictator Game

between the unrestricted log-likelihood and the restricted log-likelihood corresponds to the likelihood ratio static. The restricted log-likelihood of population 2 is 64, and the unrestricted is 59.2. Twice the difference is 9.6, which, given a χ^2 distribution with three degrees of freedom, would have a p-value of 0.022. In other words, the difference between the populations is marginally significant.

A comparison of the transfers of players from different ethnic groups indicates that the distributions were similar.[18] We thus conclude that there was no evidence for the group effect. Players in our dictator game experiment did not behave favorably toward players of their own group.

Observation 4: The results of the dictator game indicate that there is some differential treatment of groups by ethnicity but no clear systematic taste for discrimination. The distribution of transfers to the Ashkenazic players was only marginally different from the distribution of transfers to Eastern players. The average transfers were similar.

While we found some evidence of a taste for discrimination, these types of preferences cannot explain the discrimination we identified in the trust game. Since in the dictator game the average transfer to Eastern and Ashkenazic players was similar, such taste for discrimination cannot explain the huge difference of transfers in the trust game. Thus, we conclude that discrimination in the trust game is due to ethnic stereotyping that affects the players' beliefs with regard to Player B's potential reaction.

V. STEREOTYPES: REACTION TO UNFAIR TREATMENT

By changing the game again, we were able to trace other types of stereotypes. A number of Israelis have often argued that people of Eastern ethnic background tend to be more driven by a sense of "honor" or to react harshly if treated unfairly. People who openly expressed similar stereotypes in Israel were denounced as bigots and frequently punished by society. The question is whether such beliefs are actually held by a small minority in Israeli society or whether they are much more widespread than

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18. These distributions of transfers were common among both ethnic groups. In our experiment both Ashkenazic and Eastern male players transferred, on average, 5 points to Ashkenazic players, whereas Israeli male players transferred 5.2 on the average. The average transfers to Eastern players were 5.8, 5.2, and 5.8 by Israeli, Ashkenazic, and Eastern male players, respectively.

people would care to admit. In order to answer this question, we changed the game again and studied the "ultimatum game." The ultimatum game is a simple two-player, two-stage game. In the first stage, Player A is given a fixed amount of money and then asked to suggest a division of this amount between himself and Player B. At the second stage, it is Player B's turn to either accept or reject the offer. If the offer is accepted, the players get their suggested shares, but if it is rejected, neither player gets anything. As in the previous two games, any amount transferred to Player B is automatically tripled by the experimenters.

The subgame perfect equilibrium of the ultimatum game is such that Player A makes a zero (or minimal positive) offer to Player B while Player B accepts any division suggested to him. This equilibrium is based on the standard assumption that individuals strive to maximize their monetary payoffs. The ultimatum game has been extensively discussed in the literature. Numerous experiments suggest that Player A typically transfers a nonnegligible amount while Player B occasionally rejects low offers.[19] Player A's nonnegligible offers can be partially explained by his wish to achieve an equitable outcome but also by his belief that Player B may reject a low "unfair" offer. Since Player B has a strategic role in the ultimatum game, ethnic stereotypes may affect Player A's beliefs with regard to Player B's potential response.

Ultimatum Game: Experimental Design

The ultimatum game's experimental design is similar to the design of the trust and dictator games. Participants in this experiment consisted of 680 Israeli undergraduates. At the preliminary stage of the experiment, we chose students from the University of Haifa and the Tel Aviv Academic College with typical ethnic names.

The experiment consisted of two stages. At the first stage, the students from Tel Aviv University (Player A) received twenty points and were asked to propose a division between themselves and Player B. At the second stage, we approached the students at the University of Haifa and the Tel Aviv Academic College, who played the role of Player B, and asked them to decide whether to

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19. See the original experiment by Guth, Schmittberger, and Schwarze [1982] and the surveys in Camerer and Thaler [1995], Guth [1995], and Roth [1995].

TABLE IV
PARTICIPATING PAIRS IN THE ULTIMATUM GAME ACCORDING TO GENDER AND
ETHNICITY

		Player A					
		Israeli male	Ashkenazic male	Eastern male	Israeli female	Ashkenazic female	Eastern female	Total
P **L** **A** **Y** **E** **R** **B**	Ashkenazic male	23	10	14	26	17	10	100
	Eastern male	22	14	19	18	16	11	100
	Ashkenazic female	15	10	13	13	10	9	70
	Eastern female	19	12	9	14	8	8	70
	Total	79	46	55	71	51	38	340

accept the proposed division. We then paid the students accordingly.[20] Table IV illustrates the couples that were matched according to gender and ethnicity.

Ultimatum Game: Results

Figure V illustrates the distribution of (points) transferred in the ultimatum game experiment. Again we only considered transfers by male players to male players. It is interesting to note that almost 90 percent of the transfers are either five or ten points. Players chose either an equal allocation of points or an equal allocation of money. However, surprisingly, these choices depended very much on the game partners' ethnic affiliation. Eastern male players received, on average, 8.4 while the average transfer to Ashkenazic male players was only 5.9. By using the likelihood ratio test, we found that the restricted log-likelihood of population 2 was 169 and the unrestricted 53. Twice the difference is 232, which given a χ^2 distribution with 3 degrees of freedom, would have a p-value of less than 0.001. Hence we conclude that the difference is highly significant.
Observation 5: There is ethnic discrimination in the ultimatum game. Eastern players receive larger transfers than Ashkenazic

20. The instructions for this experiment are available from the authors upon request.
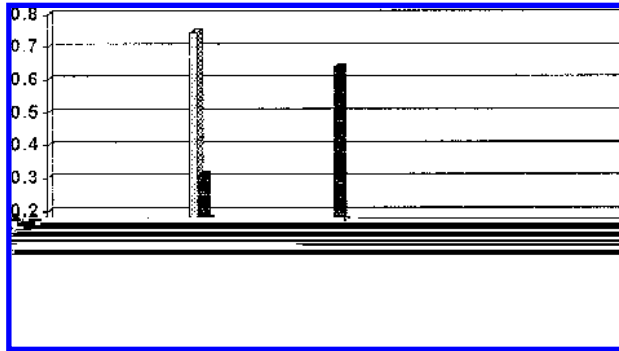
FIGURE V
Transfer by Males to Males According to Origin in the Ultimatum Game

players. This discrimination is probably the outcome of a common ethnic stereotype in Israeli society, according to which men of Eastern origin are believed to react more harshly if treated unfairly.

Is discrimination in the ultimatum game rational? In order to test for statistical differences in the reaction of individuals, we examined the rejection rates of Player B when being offered 5 points. Seven (10 percent) out of the 67 Ashkenazic males who were offered 5 points rejected them, whereas 3 (8 percent) out of the 38 Eastern males did not. We conclude that there is no evidence for statistical discrimination in the ultimatum game.

VI. GENDER AND DISCRIMINATION

When considering the relationship between gender and ethnic discrimination, there are two separate but related questions. (i) Is there discrimination against women, and does it depend on ethnic affiliation? (ii) Do women themselves discriminate between Ashkenazic and Eastern players? While gender may affect the outcome of all three experiments discussed in this paper, we have limited the discussion in this section to the trust game only.

Gender/Ethnic Discrimination

We shall now discuss the results of the trust game experiment in which women played the role of Player B. Our first observation in this experiment is that the average transfer to
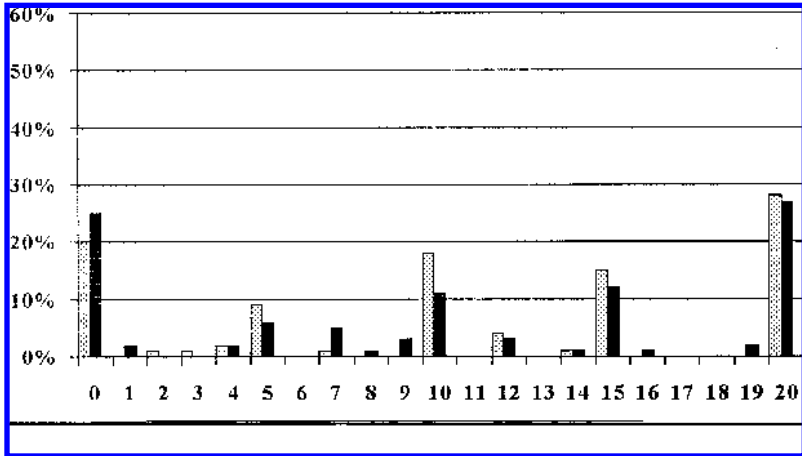
FIGURE VI
Transfer to Female Players in the Trust Game

female players was 10.63, which is *similar* to the average transfer to male players, namely 11.42. Thus, at first glance there is no evidence of gender-based discrimination. This conclusion, however, is misleading, as we need to examine the gender/ethnic combination.

Figure VI describes the distribution of transfers to female players based on their ethnic background. The average transfer to Ashkenazic female players is 11.02, while the average transfer to Eastern female players is 10.41. The difference between these two distributions is statistically insignificant [$F(1, 222) = 352$, $P > .05)$].

Observation 6:

(i) We found no evidence of ethnic discrimination between women in the trust game.

(ii) The average transfer from male players to Ashkenazic women was 11.02, whereas the average transfer to Ashkenazic men was 15.15. A comparison between the two distributions implies that Ashkenazic women are *less* trusted than Ashkenazic men are. The difference is highly significant [$F(1, 238) = 19.78$, $P < .00)$]. On the other hand, the average transfer to Eastern women was 10.41 while the average transfer to Eastern men was 8.06. A comparison between the two distributions implies
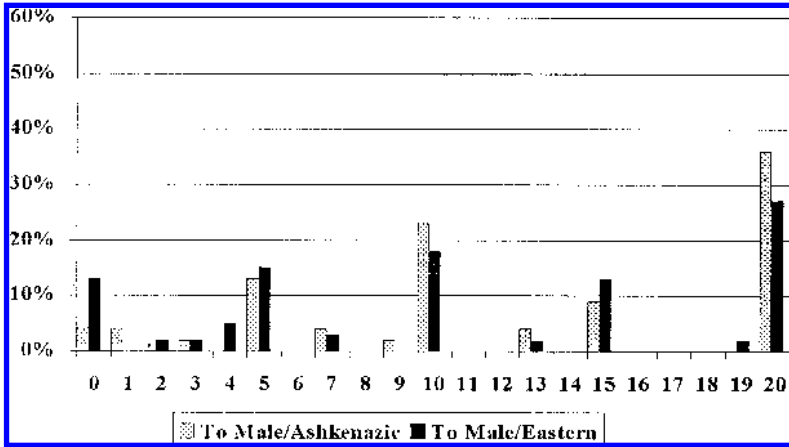
FIGURE VII
Transfer from Females to Male/Ashkenazic and Male/Eastern in
the Trust Game

that Eastern women are *more* trusted than Eastern men
are [$F(1, 240) = 5.57, P < .019$)].

It is noteworthy that the above observation is consistent
with several early studies on discrimination of Afro-American
women in the United States. For example, Epstein [1993]
pointed out that, although one may expect that Afro-American
women may face more severe discrimination (double subordi-
nation), this may actually result in a relative advantage. Of
further interesting note is that the ethnic earning gaps in
Israel among women are actually smaller than those among
men (see Cohen and Haberfeld [1998]). See also Blau, Ferber,
and Winkler [1997] who find that in the United States the
differences in earnings between Afro-Americans and whites
are smaller for females than for males.

Do Women and Men Discriminate in the Same Way?

After discussing behavior *toward women,* we now address
women's behavior, namely the way women play the trust game
when they are assigned as Player A. Once again, we have only
considered the case in which Player B is a male player. (Note that
we did not find any evidence of discrimination between women of
different ethnic backgrounds.)

Figure VII illustrates the distribution of transfers by female

players to Ashkenazic and Eastern male players. The comparison of Figure VII (the distribution of transfers by female players) to Figure II (the distribution of transfers by male players) is striking: men responded strongly to ethnic stereotypes; whereas women did not. The average transfer by women to Eastern male players was 10.94, whereas the average transfer by women to Ashkenazic male players was 12.53. The difference between the distributions is insignificant [$F(1, 113) = 1.48, P > .05)$]. By contrast, the average transfer made by male players to Eastern male players was 5.62, whereas the average amount that men transferred to Ashkenazic male players was 17.16.

When women played the trust game with other women, the average transfer to Ashkenazic women was 11.3, and the average transfer to Eastern women was 10.38. A comparison of these outcomes with the above results implies the following.

Observation 7:

(i) We found no evidence that women's trust in their game partners is based on ethnic affiliation or on gender.[21]

(ii) Men trust Ashkenazic male players more than women do. On the other hand, men trust Eastern male players less than women do.

Our finding is consistent with the observation that the ethnic earning gaps in Israel among women are indeed smaller than among men and that in recent years, Ashkenazic men have increased the earning gaps between them and other groups (see Cohen and Haberfeld [1998]).

VII. Concluding Remarks

Ethnic stereotyping may result in different types of discrimination in schooling, wages, the product market, etc. An important difference between the different types of discrimination is their degree of observability. An important aspect of discrimination pertains to interpersonal relations (such as trust and willingness to cooperate), which are difficult to observe. Wages, on

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21. It was common knowledge in our experiment that all players were students. It is possible that the ethnical pattern of trust and mistrust also depends on the game partners' level of education. Thus, our experiments indicate that women do not discriminate based on ethnic background when they play with educated partners. We cannot, however, reach similar conclusions for the entire population of potential partners.

the other hand, are relatively observable and have therefore been the focus of most of the studies on discrimination. If we were to devise public policies aimed at lessening ethnic discrimination, it would probably be easier to implement such policies with observable cases of discrimination. We may have antidiscrimination laws claiming that wages and school admissions must be independent of ethnic background or gender, but legislation with respect to trust and interpersonal relationships are ineffective.

This paper focused on how to examine the types of discrimination that are not easily observable. By using game experiments, one can identify these types of discrimination since the experiments are based on preferences revealed by individuals when facing a strategic situation with another individual. Clearly, such experiments cannot be used as a legislative tool; however, in our opinion, they could serve as an important educational tool. To begin with, these experiments could be used to confront individuals with their own behavior. In a class in which this experiment was used as a demonstration, participants were informed of its true purpose at the end of the experiment. They reacted by saying that they had considered neither the name nor the ethnic signal as relevant information and that their own prediction was that the distribution of transfers to Eastern and Ashkenazic players would be similar. After the brief classroom debate, the experimenter opened the forms and showed the students the distribution of transfers in the class. The reaction was one of silence and total amazement. There was no disagreement in the class with regard to the results since they were overwhelming. However, the silence was mainly due to the recognition that indeed, even without being aware of it, the students in the class had blatantly discriminated against one group. This is precisely the advantage of using experiments rather than questionnaires, which are commonly used in many of the sociological discrimination surveys. The experiments illustrate people's behavior rather than what people *believe to be* their own behavior.

APPENDIX 1: INSTRUCTIONS FOR PLAYER A
(TRANSLATED FROM HEBREW)

Welcome to this experiment in decision-making during which you may earn some money that will be paid to you, privately and in cash, at the end.

The interaction in the experiment will be in pairs. You are

called Student A and the student you are matched with is called Student B. The participants in the role of Student B are from the University of Haifa.

At the beginning of the experiment you will receive NIS 20, and Student B will not receive any money. You are asked to decide whether you wish to transfer any amount of the NIS 20 to the student you are matched with and if so, how much. We will triple the amount you transfer and give it to Student B; that is, for every NIS 1 that you transfer, Student B will receive NIS 3.

In a few days time, we will ask Student B to decide if (s)he wants to return any of the money (s)he received (three times what you sent); and if so, how much. This amount will not be tripled. This will conclude the experiment, and the money will be paid. Name of the student you are matched with (Student B): ____
Your name: ____
Amount of money you wish to transfer to Student B: ____ (Please remember that this amount should be between NIS 0 and NIS 20.)

Appendix 2: Results of the Mann-Whitney *U*-Test Based on Ranks

As argued in the text, although ANOVA is the standard test in such studies, some of the tests' assumptions, most notably the normality assumption, are not fulfilled by our data. Therefore, in order to support the statistical analysis, we have also conducted a nonparametric test. As it turns out, the two tests result in similar conclusions based on our data. The results of the nonparametric test are provided below in an order corresponding to that of the ANOVA test reported in the paper.

Appendix 3: Results of the Nonparametric Test

Comparison of	Z	P<
Transfer to Ashkenazic males/Eastern males	7.363	.000
Transfer to males/females	1.390	.164
Transfer to Ashkenazic females/Eastern females	.682	.527
Transfer to Ashkenazic males/Ashkenazic females	4.672	.000
Transfer to Eastern males/Eastern females	2.073	.038
Transfer from females to Ashkenazic males/Eastern males	1.288	.198
Transfer from males to Ashkenazic males/Eastern males	7.904	.000

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