STEREOTYPE–BIASED SEARCH AND PROCESSING OF INFORMATION ABOUT GROUP MEMBERS

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Two studies examined the contribution of biased information search and biased information processing to stereotyping of individual group members. Participants were free to ask any question they thought would help them make an accurate judgment about a target person's attitudes. Despite this opportunity to acquire individuating information, participants' judgments about group members were strongly influenced by their stereotypes. The findings further show that both the content of the questions addressed to stereotyped targets and the manner in which the answers to these questions were processed contributed to stereotyping. It is argued that biased information search is a major obstacle to the reduction of stereotyping in many real-life situations.

A considerable amount of social psychological research has shown that stereotypes often bias judgments about individual group members (for reviews, see Fiske, 1998; Hamilton & Sherman, 1994; Hilton & von Hippel, 1990; Olson, Roese, & Zanna, 1996). Two sets of cognitive processes jointly contribute to this biasing effect of stereotypes. The first has to do with the ways in which perceivers seek information about others. The second has to do with the ways in which perceivers process the information that they obtain. Past stereotyping research has focused on the second set of processes. A typical

study provides participants with fixed information and examines the ways in which participants' stereotypes influence the processing of this information and subsequent judgments (e.g., Bodenhausen & Lichtenstein, 1987; Bodenhausen & Wyer, 1985; Brewer, 1988; Fiske & Neuberg, 1990; Fiske, Neuberg, Beattie, & Milberg, 1987; Pendry & Macrae, 1994; Stangor & Lange, 1994; Yzerbyt, Schadron, Leyens, & Rocher, 1994; for reviews see Fiske, 1998; Hamilton & Sherman, 1994; Hilton & von Hippel, 1990; Olson et al., 1996). This research has identified a number of factors that enable perceivers to overcome the influence of their stereotypes in processing information and making judgments of others. These factors include exposure to a large amount of individuating information about the target person, motivation to reach an accurate judgment, and abundant cognitive resources to systematically process the information (e.g., Brewer, 1988; Fiske & Neuberg, 1990).

Recently, some research has begun to examine how stereotypes influence the way in which perceivers actively seek information about others (e.g., Johnston, 1996; Johnston & Macrae, 1994; Leyens, Dardenne, & Fiske, 1998; Leyens & Yzerbyt, 1992; Trope & Thompson, 1997). Overall, this research has found that perceivers preferentially seek stereotype–confirming information. This finding is important because it suggests that when perceivers are free to seek information about a target person, their biased information search may lead them to a stereotyped judgment even when their processing of the acquired information is unbiased. Past research, however, has not examined how stereotyped information search, independent of stereotyped information processing, biases judgments about group members. The purpose of the present research, then, was to assess the joint contribution of these two types of bias to stereotyped judgments.

Let us first explicate how stereotypes might affect information search. Suppose that perceivers can address questions to a target person to determine whether she possesses a stereotype–related attribute. For example, a perceiver may ask questions of a feminist to determine her stance on legalized abortion. These questions can either be symmetric or asymmetric in their diagnostic value (see Trope & Thomspon, 1997). A question is symmetric when a confirming answer and a disconfirming answer are equally diagnostic. That is, the certainty that the target person possesses the attribute given a confirming answer is the same as the certainty that she does not possess

the attribute given a disconfirming answer. A question is asymmetric when one answer is more diagnostic, affords greater certainty, than the other answer. When a confirming answer is more diagnostic than a disconfirming answer, the question is considered asymmetrically confirming. In contrast, when a disconfirming answer is more diagnostic than a confirming answer, the question is considered asymmetrically disconfirming. For instance, the question "Do you support the aims of organizations like Planned Parenthood?" would be symmetric—a confirming answer provides as much certainty about the person's opinion of legalized abortion as does a disconfirming answer, because a pro-choice advocate would be likely to endorse Planned Parenthood to the same extent that a pro-life advocate would be unlikely to endorse it. In contrast, the question "Do you support government–funded abortions?" would be asymmetric—a confirming answer provides a high degree of certainty about the person's opinion of legalized abortion, because only a pro-choice advocate would be likely to endorse government–funded abortions. A disconfirming answer, however, affords little certainty regarding the person's attitude, because pro-life advocates, as well as many pro-choice advocates, may disagree with this policy. Thus, both symmetric and asymmetric questions allow confirming and disconfirming answers, and both types of questions can be highly diagnostic. The difference between symmetric and asymmetric questions is in the difference between the diagnosticity of a confirming versus a disconfirming answer, such that for asymmetric questions, one answer is more diagnostic than the other.

Stereotypes influence the type of questions a perceiver chooses in inquiring about a target person by increasing the subjective probability of receiving a confirming answer to one's questions. That is, a stereotyped person is more likely than a nonstereotyped person to provide a confirming answer. This, in turn, increases the expected diagnostic value of asymmetrically confirming questions, because confirming answers to such questions are more diagnostic than disconfirming answers (see Trope & Thompson, 1997). For example, let us suppose that supporting legalized abortion is part of the stereotype of a feminist, but not part of the stereotype of a teacher. A feminist, then, would be more likely than a teacher to provide the highly diagnostic confirming answer to the question "Do you support government–funded abortions?" Asymmetric confirming questions, therefore, are likely to yield highly diagnostic answers more so from

stereotyped targets than from nonstereotyped targets. It is the case also that stereotyped targets are more likely than nonstereotyped targets to give a confirming answer to a symmetrical question. Because these confirming and disconfirming answers are equally diagnostic, however, symmetric questions have the same expected diagnostic value for stereotyped and nonstereotyped targets. A feminist may be more likely to give a confirming answer to the question "Do you support the aims of organizations like Planned Parenthood?" but this would not increase the expected diagnostic value of the question, because a disconfirming answer would be just as informative. Finally, in the case of asymmetrically disconfirming questions, a stereotyped target would be more likely than a nonstereotyped target to give the less diagnostic confirming answer. The expected diagnostic value of asymmetric disconfirming questions, then, would be lower for stereotyped targets than for nonstereotyped targets.

In sum, perceivers can increase the diagnostic value of the information they obtain by addressing asymmetrically confirming questions to stereotyped targets because this type of question, compared to the other types of questions, has greater diagnostic value for stereotyped targets than for nonstereotyped targets (see Trope & Thompson, 1997). This diagnostic search strategy, as efficient and diagnostic as it is, also is biased in favor of stereotype confirmation. Because asymmetric confirming questions can better confirm than disconfirm stereotypic beliefs, they are likely to result in *asymmetric certainty*, namely, greater certainty that a target possesses the stereotype–consistent attribute after a confirming answer and less certainty that a target possesses the stereotype–inconsistent attribute after a disconfirming answer.

Asymmetric certainty also can result from stereotyped processing of the target's answers to a perceiver's questions. Given the same confirming answers from a stereotyped target and a nonstereotyped target, perceivers may still feel more certain that the stereotyped target possesses the stereotype–consistent attribute. Similarly, given the same disconfirming answers from the two targets, perceivers may continue to feel less certain that the stereotyped target possesses the stereotype–inconsistent attribute. In other words, independent of the type of questions asked, the difference in certainty following confirming versus disconfirming answers, or asymmetric certainty, may be greater for stereotyped targets than for nonstereotyped tar-

gets. For instance, in judging a feminist, perceivers may feel much more certain in inferring that she is pro-choice when she says that she supports government–funded abortions than in inferring that she is pro-life when she says that she does not support government–funded abortions. In contrast, when judging a teacher, perceivers are likely to have a more similar level of certainty in inferring that the teacher is pro-choice when she says that she supports government–funded abortions as inferring that she is pro-life when she says that she opposes government–funded abortions.

Thus, stereotypes can bias both information search and information processing, both of which contribute to asymmetric certainty. When both information search and information processing are biased by stereotypes, asymmetric certainty is at its highest. When neither information search nor information processing is biased, asymmetric certainty is at its lowest. Asymmetric certainty is intermediate when either information search or information processing is biased.

Past research has separately examined either biased information search or biased information processing. It is possible, though, to simultaneously assess the independent contribution of stereotype–biased information search and stereotype–biased information processing to perceivers' judgments of others. One such paradigm would have perceivers ask questions to a stereotyped target or a nonstereotyped target and then receive answers from both stereotyped and nonstereotyped targets. For example, suppose that the task is to find out whether a target person supports legalized abortion. Perceivers would then address questions to a feminist (stereotyped target) or a teacher (nonstereotyped target) and would then receive answers from both targets. By examining the judgments made about the feminist and the teacher based on answers to questions addressed either to the feminist or to the teacher, one could assess the influence of biased questions, separately from the influence of the biased processing of the answers, on asymmetric certainty about stereotyped targets.

The present studies asked participants to address questions to target persons and then make judgments about the targets' stereotyped attributes on the basis of the answers they received. In Study 1, participants addressed questions to and received confirming and disconfirming answers from the same target, either a stereotyped or a nonstereotyped person. In this study, then, the target of questions

TABLE 1. Predicted Asymmetric Certainty as a Function of Target of Questions and Target of Judgment

	Target of Questions	
	Stereotyped	**Nonstereotyped**
Stereotyped	High asymmetric certainty	Intermediate asymmetric certainty
Target of Judgment		
Nonstereotyped	Intermediate asymmetric certainty	Low asymmetric certainty

(the target to whom questions were addressed) was also the target of inference (the target whose attributes were inferred). Asymmetric certainty (i.e., the difference between the certainty that the target possesses the stereotype–consistent attribute given a confirming answer and the certainty that the target possesses the stereotype–inconsistent attribute given a disconfirming answer) was assessed for both the stereotyped and nonstereotyped targets. A difference in asymmetric certainty about the stereotyped target versus nonstereotyped target would reflect the combined effect of stereotyped–biased questions and stereotyped–biased processing of the answers.

In Study 2, participants addressed questions to either stereotyped targets or nonstereotyped targets and then received confirming and disconfirming answers from both stereotyped and nonstereotyped targets. The target of questions was thus independent of the target of judgment. This study, therefore, enabled us to assess the independent contributions of stereotype–biased information search and information processing to asymmetric certainty. Specifically, an effect of the target of questions would reflect the contribution of stereotype–biased question generation, whereas an effect of the target of inference would reflect the contribution of stereotype–biased processing of the answers. As discussed above, asymmetric certainty would be greatest when the target of questions and the target of judgment are both stereotyped (see Table 1). Asymmetric certainty would be lowest when neither the target of questions nor the target of judgment is stereotyped. Asymmetric certainty would be intermediate when either the target of questions or the target of judgment is stereotyped.

TABLE 2. Mean estimated attitude probabilities for targets within each matrix (Pretest to Study 1)

Issue	Target	
	American Jew	**Feminist**
Supports increasing U.S. support for Israel	**74.10%**	45.40%
Supports restrictions on pornography	53.50%	**76.10%**
	Computer "Geek"	**Teacher**
Spends hours on the Internet	**81.50%**	53.50%
Supports restrictions on televised violence	47.20%	**71.70%**
	High School Teacher	**Southern Politician**
Supports increasing student loans	**72.00%**	47.80%
Supports prayer in schools	46.30%	**67.00%**
	Catholic Priest	**Lawyer**
Opposes gay marriages	**85.40%**	49.60%
Opposes restrictions on the amount of money that can be sued for in a trial	47.60%	**67.20%**

Note. Boldface means represent data for stereotyped targets.

STUDY 1

The aim of Study 1 was to assess the combined effects of stereotype–biased information search and stereotype–biased information processing on asymmetric certainty. Participants were asked to address questions to stereotyped and nonstereotyped targets and, based on the answers, to judge the targets' stand on stereotype–related attitudes. We predicted that participants would address more asymmetrically confirming questions to stereotyped targets than to nonstereotyped targets. The use of such questions, together with stereotype–biased processing of the answers, should produce greater asymmetric certainty for stereotyped targets than for nonstereotyped targets.

METHOD

Stereotyped and Nonstereotyped Targets. To generate stereotyped and nonstereotyped targets, four matrices of social category/issue combinations were generated (see Table 2). Each matrix consisted of

four combinations of two social category members and two attitude issues, such that each attitude issue was strongly associated with one category member, creating a "stereotyped target," and weakly associated with the other category member creating a "nonstereotyped target."

These matrices were selected on the basis of pretesting a pool of 32 social category/issue combinations. Pretest participants were a separate group of introduction to social psychology students ($N = 46$) who completed this task on a volunteer basis. For each social category/issue combination, pretest participants estimated the probability that the target supported the attitude issue on a 0% (*No Chance*) to 100% (*Definite*) scale. Indeed, the stereotyped targets ($M = 74.38, SD = 9.19$) had a significantly higher estimated attitude probability than the nonstereotyped targets ($M = 49.57, SD = 7.38$; see Table 2), $F(1, 45) = 275.68, p < .001, \eta^2 = .65$.

Participants. A total of 46 introductory psychology students at New York University participated in partial fulfillment of a course requirement.

Procedure. Participants were recruited for a study called "Predictions" and run in groups of three to five They were told that they would make judgments about others' attitudes and that before making these judgments they would have an opportunity to ask some questions that might help them make their judgments. They were further told that the people they would make judgments about had provided a great deal of information about themselves in a previous study, which would be used to provide answers to their questions. Participants were led to expect that the accuracy of their inferences would be evaluated. Specifically, they were told that their judgments would be compared to the target's self–reported attitudes and that the accuracy of their judgments would be evaluated in front of the group at the end of the session. In addition, instructions to the participants emphasized that they could not ask about the targets' attitudes directly, that they had to ask each target three questions, and that all of the questions had to be answerable in a yes/no format. After receiving these instructions, participants completed a sample exercise in order to familiarize them with the format of the question generation task.

Participants received descriptions of the yoked pairs of targets from each matrix (e.g., high school teacher and Southern politician) and were asked to address three questions to each of the targets with

regard to one issue from each matrix (e.g., increasing student loans). In addition, the yoked pairs of targets were put into three different orders to control for any possible order effect. Thus, target and matrix were varied within participants, whereas issues and order were varied between participants.

After writing questions to all of the targets, participants were asked to go back to each of their questions and to rate the probability that the target held the stereotyped attitude on a 0% (*No Chance*) to 100% (*Definite*) scale given a hypothetical "yes" or "no" answer to that question. For each question, an answer was defined as confirming if the estimated probability given that answer was greater than given the other answer. For example, the question "Do you have a trust fund established for your child's college education?" regarding increasing student loans, would have "no" as the confirming answer and "yes" as the disconfirming answer, because the estimated probability of supporting increasing student loans would be higher given a "no" answer than a "yes" answer.

RESULTS AND DISCUSSION

We hypothesized that questions addressed to stereotyped targets would tend to be more asymmetrically confirming than questions addressed to nonstereotyped targets. Using these questions, in combination with stereotype–biased processing of the answers, participants should show greater asymmetric certainty for stereotyped targets than for nonstereotyped targets. Note that we use the terms "stereotyped" and "nonstereotyped" targets to refer to the particular combination of social category member and issue that made it stereotypical or non–stereotypical.

The asymmetry of each question was calculated as the probability of the stereotype–consistent attitude given a confirming answer minus the probability of the stereotype–inconsistent attitude given a disconfirming answer. In their judgments, participants provided us with their probability of the stereotype–consistent attitude given a confirming answer and the probability of the stereotype–consistent attitude given a disconfirming answer. Thus, the probability of the stereotype–inconsistent attitude was calculated by subtracting the probability of stereotype–consistent attitude given a disconfirming answer from 100. For example, a participant may have estimated an 80% probability of supporting increasing student loans when pro-

TABLE 3. Mean Estimated Attitude Probabilities Given Confirming and Disconfirming Responses, and Asymmetric Certainty Scores as a Function of Target, Collapsed Across Matrix (Study 1)

Issue	Target of Questions	
	Stereotyped Target	Nonstereotyped Target
Supporting issue given a confirming response	**78.79 (7.43)**	72.36 (7.77)
Not supporting issue given a disconfirming response	**65.48 (8.85)**	72.94 (8.79)
Asymmetric certainty	**13.31 (12.35)**	−.58 (10.04)

Note. Boldface means represent data for stereotyped targets. Standard deviations are in parentheses.

vided with a "no" (confirming) answer to the question "Do you have a trust fund established for your child's college education?" and a 40% probability of supporting increasing student loans when provided with a "yes" (disconfirming) answer. The asymmetry of this question, then, would be calculated as the probability of the stereotype–consistent attitude given a confirming answer (80) minus the probability of the stereotype–inconsistent answer given a disconfirming answer (100 – 40), which would yield an asymmetric certainty score of 20. For each participant, mean asymmetric certainty scores were computed by averaging across the questions asked each target. Averaging across all participants, then, mean asymmetric certainty scores for each matrix can be seen in Table 3, as well as the two component probability estimates.

The asymmetric certainty scores from each matrix were subjected to a repeated–measures MANOVA, with target (stereotyped versus nonstereotyped) and matrix as within–participants factors and issue and order as between–participants factors. This analysis yielded only the expected significant main effect for Target, $F(1, 40) = 75.16$, $p < .0001$, $\eta^2 = .65$. This effect was significant for each of the four matrices, ps < .02. As can be seen in Table 3, this effect indicates that the asymmetric certainty of inferences from answers provided by stereotyped targets ($M = 13.31$) was greater than the asymmetric certainty of inferences from answers provided by nonstereotyped targets ($M = −.58$). Specifically, confirming and disconfirming answers produced the same degree of certainty regarding the attitudes of nonstereotyped targets (Ms = 72.36 and 72.94, respectively). In contrast, confirming answers produced greater certainty than did

disconfirming answers when the attitudes of stereotyped targets were judged (*M*s = 78.79 and 65.48, respectively).[1]

These results demonstrate that having the opportunity to acquire individuating information about stereotyped targets does not necessarily eliminate stereotyped judgments about those targets. When judging a stereotyped (rather than a nonstereotyped) target, participants were relatively certain that the target possessed a stereotyped attribute given confirming answers, but were relatively uncertain that the target did not possess this attribute given disconfirming answers. Theoretically, two factors contribute to this asymmetric certainty about stereotyped targets. One is a tendency to address asymmetric confirming questions to stereotyped targets—questions that can better confirm the stereotype than disconfirm the stereotype. The other is a tendency to infer the stereotyped attribute from any given answer when the answer comes from a stereotyped target rather than a nonstereotyped target. The former is a bias in the questions addressed to stereotyped people, whereas the latter is a bias in the processing of the answers provided by stereotyped people. The next study was designed to assess the independent contribution of these two processes.

STUDY 2

This study assessed the contribution to stereotyping of biased questions and biased processing of the answers by separating targets of questions from targets of inference. Specifically, we asked participants to address questions to stereotyped or nonstereotyped targets (targets of questions) and provided them with confirming and disconfirming answers to these questions from both stereotyped and nonstereotyped targets (targets of inference). For instance, participants were asked to address questions to a vegetarian to determine his attitude toward killing animals for fur (a stereotype–related attitude). They then received answers from the vegetarian as well as answers from a TV producer (a target for whom this would be a nonstereotype–related attitude) and asked to make judgments regarding both the vegetarian and the TV producer. An effect of stereo-

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1. Reflecting this pattern of means, a MANOVA of the component attitude probabilities with confirming versus disconfirming answers as a within-participants factor yielded a significant target (stereotyped versus nonstereotyped) x answer (confirming versus disconfirming) interaction, $F(1, 40) = 71.85$, p .0001, $\eta^2 = .64$.

typed versus nonstereotyped target of questions on asymmetric certainty would reflect a tendency to ask stereotyped targets asymmetric confirming questions—questions that can better confirm than disconfirm the stereotyped attribute. An effect of stereotyped versus nonstereotyped target of inference on asymmetric certainty would reflect a tendency to infer stereotyped attributes from the answers when the answers (either confirming or disconfirming) come from a stereotyped target. We expected both an effect of the target of questions and an effect of the target of inference on asymmetric certainty (see Table 1).

METHOD

Participants. A total of 53 introductory psychology students at New York University participated in partial fulfillment of a course requirement. Eight participants were excluded from analyses because in the check on the manipulation (see below) they did not rate the stereotyped targets to be more likely to hold the stereotypical attitudes than the nonstereotyped targets. Thus, a total of 45 participants are included in the analyses.

Stereotyped and Nonstereotyped Targets. To generate stereotyped and nonstereotyped targets, we again used matrices of social category member/attitude issue combinations. Each matrix consisted of four combinations of two social category members and two attitude issues, such that each attitude issue was strongly associated with one social category member, creating a "stereotyped target," and weakly associated with the other social category member, creating a "nonstereotyped target." Due to the longer procedure that Study 2 required, however, only two matrices were employed. In addition, to extend the generalizability of our findings, we employed one of the original matrices from Study 1, but added a new matrix with TV Producer and Vegetarian as targets and the practice of killing animals for fur and government censorship of film as attitude issues.

To verify that participants perceived these social category member/attitude issue combinations in a stereotypical or a non–stereotypical way, we had participants initially judge for each social category member/issue combination the probability (0% to 100%) that the target supported the attitude issue. As intended, attitude probabilities were higher for the stereotyped targets ($M = 77.72$, $SD = 15.47$) than for the nonstereotyped targets ($M = 51.78$, $SD = 11.99$), $F(1, 44) = 96.55$, $p < .001$, $\eta^2 = .69$ (see Table 4).

TABLE 4. Initial Mean Estimated Attitude Probabilities for Targets within each Matrix (Check on Manipulation for Study 2)

Issue	Target	
	Vegetarian	**TV Producer**
Opposes killing animals for their fur	**77.25% (15.60)**	52.25% (9.66)
Opposes government censorship of film	59.40% (18.67)	**79.20% (22.30)**
	Computer Geek	**Teacher**
Spends hours on the Internet	**84.80% (14.10)**	45.20% (16.30)
Supports restrictions on televised violence	50.00% (10.76)	**67.50% (15.52)**

Note. Boldface means represent data for stereotyped targets. Standard deviations are in parentheses.

Procedure. Participants were recruited for a study called "Predictions" and run in groups of three to five. They were told that the study was concerned with how people make judgments about others based on limited information and that the study would consist of two parts. In the first part, participants were told that they would be making their judgments based on very limited information, just some background information about each person. This first part, then, constituted our check on the manipulation of the stereotyped and nonstereotyped targets discussed above.

In the second part of the study, participants were told that, before making judgments about some of the people's attitudes toward certain issues, they would have an opportunity to ask some questions that might help them make their judgments. They were then told that the people they would make judgments about had provided a great deal of information about their attitudes toward certain issues in a previous study, which would be used to provide answers to their questions. In addition, participants were led to expect that the accuracy of their inferences would be evaluated. Specifically, they were told that their judgments would be compared to the target's self–reported attitudes and that the accuracy of their judgments would be evaluated in front of the group at the end of the session. As in Study 1, participants were told that they could not ask about the targets' attitudes directly, that they had to ask each target three questions, and all that of the questions had to be answerable in a yes/no format. After receiving these instructions, participants completed a sample exercise in order to familiarize them with the format of the question generation task.

Participants were then randomly assigned to either a stereotyped target of questions condition or a nonstereotyped target of questions condition such that they wrote their questions to either the stereo-typed or nonstereotyped targets of the two matrices. Participants also were randomly assigned to either a confirming–answers–first condition or disconfirming–answers–first condition such that the answers that they received from the first set of targets either con-firmed or disconfirmed the attitude. Participants wrote their ques-tions for either the stereotyped or nonstereotyped targets on separate sheets of paper, which the experimenter took into the next room in order to "look up what the person's answer would have been." In fact, the experimenter attached small sticky notes after each question with either a "yes" or "no" response. The first set of responses that participants received was always from the intended target of their questions and either confirmed or disconfirmed the attitude based on the condition to which they had been assigned. Participants then received responses from targets that were the complement to the first set in that, if the participant had asked questions of stereotyped tar-gets, this second set of answers was supposedly from nonstereotyped targets. In addition, these responses complemented those from the first set, such that if the participant was in the confirming–answers–first condition, this next set of targets would respond in a disconfirming manner.

This process was repeated so that, in total, participants received re-sponses from four groups of targets: (a) stereotyped targets who pro-vided confirming answers, (b) stereotyped targets who provided disconfirming answers, (c) nonstereotyped targets who provided confirming answers, and (d) nonstereotyped targets who provided disconfirming answers. For example, a participant assigned to the stereotyped target-of-questions condition and the confirming–an-swers–first condition would first ask questions to Joe, a vegetarian, about his stance on killing animals for fur and then would receive (1) confirming answers from Joe, (2) disconfirming answers from Ste-phen, a TV producer, (3) disconfirming answers from Brian, another vegetarian, and (4) confirming answers from John, another TV producer.

For each set of targets' responses, the experimenter handed the participants their question sheets with the answers marked and a judgment sheet that gave a brief description of the person who had supposedly answered their questions. The experimenter then asked

participants to indicate their judgment regarding the target's attitude after taking into consideration the target's answers to their three questions. This judgment sheet asked the participant to indicate the probability that the target held the attitude on a 0% (*No Chance*) to 100% (*Definite*) scale.

In Study 2, then, participants received descriptions of the yoked pairs of targets from each matrix (e.g., vegetarian and TV producer) and were asked to address three questions to one of the targets with regard to one issue from each matrix (e.g., supporting the killing of animals for their fur). Thus, the target of inference and matrix were within–participants factors and the target of questions, confirming–/disconfirming–answers–first, and issue were between–participants factors. By examining the difference in attitude probability given confirming versus disconfirming answers, we were able to assess the asymmetric certainty in participants' inferences.

RESULTS AND DISCUSSION

We hypothesized that questions addressed to stereotyped targets would tend to be more asymmetrically confirming than questions addressed to nonstereotyped targets. That is, questions initially addressed to stereotyped targets would be constructed so that the stereotype confirming answers would be more diagnostic than stereotype disconfirming answers, regardless of whether the target of inference was stereotyped or nonstereotyped. This would be reflected in a main effect of the target of questions on asymmetric certainty, such that asymmetric certainty would be greater when the target of questions was stereotyped rather than nonstereotyped. The inferences from any given answer should also depend on participants' stereotypes, such that inferences should show greater asymmetric certainty when the target of inference was stereotyped rather than nonstereotyped, regardless of the target of questions. This would be reflected in a main effect of the target of inference on asymmetric certainty.

Asymmetric certainty was calculated as the probability of the stereotype–consistent attitude given confirming answers minus the probability of the stereotype–inconsistent attitude given disconfirming answers. For example, the asymmetry for the vegetarian was calculated from the participant's estimated probability of opposing killing animals for fur given confirming answers minus the

TABLE 5. Mean Estimated Attitude Probabilities given Confirming and Disconfirming Responses, and Asymmetric Certainty Scores as a function of Target of Questions and Target of Inferences, Collapsed across Matrix (Study 2)

	Target of Inferences	
Issue	Stereotyped Target	Nonstereotyped Target
Stereotyped Target of Questions		
Supporting issue given a confirming response	**85.71 (10.87)**	72.86 (12.31)
Not supporting issue given a disconfirming response	**48.57 (17.90)**	60.24 (13.55)
Asymmetric certainty	**37.14 (22.56)**	12.62 (18.62)
Non–Stereotyped Target of Questions		
Supporting issue given a confirming response	**77.71 (12.42)**	69.79 (15.29)
Not supporting issue given a disconfirming response	**57.29 (15.81)**	73.54 (9.50)
Asymmetric certainty	**20.42 (23.54)**	–3.75 (17.95)

Note. Boldface means represent data for stereotyped targets. Standard deviations are in parentheses.

participant's estimated probability of not opposing killing animals for fur given disconfirming answers. The probability of not opposing killing animals for fur (the stereotype–inconsistent attitude) was calculated by subtracting the probability of opposing killing animals for fur given disconfirming answers from 100. Averaging across all participants, then, mean asymmetric certainty scores as well as the two component probability estimates can be seen in Table 5.

The average stereotype and nonstereotype asymmetry scores from each matrix were subjected to a repeated–measures MANOVA, with target of inference and matrix as within–participants factors and target of questions, confirming–/disconfirming–answers–first, and issue as between–participants factors. Preliminary analyses revealed no effects of confirming–/disconfirming–answers–first or issue, so these factors will not be discussed further. This analysis yielded the expected main effect for the Target of Questions, $F(1, 42) = 11.34$, $p = .002$, $\eta^2 = .21$, and main effect for the Target of Inference, $F(1, 42) = 43.54$, $p < .001$, $\eta^2 = .51$. As can be seen in Table 5, the main effect for the Target of Questions indicates that the asymmetric certainty for the questions addressed to stereotyped targets was greater ($M = $

24.88, *SD* = 28.41) than the asymmetric certainty for questions addressed to nonstereotyped targets (*M* = 7.61, *SD* = 28.61), regardless of whether the target of inference was stereotyped or nonstereotyped. The significant main effect of the Target of Inference indicates that asymmetric certainty was greater in drawing inferences about stereotyped (*M* = 27.96, *SD* = 24.55) than nonstereotyped targets (*M* = 3.75, *SD* = 20.06), independent of whether the questions were originally addressed to stereotyped or nonstereotyped targets. As expected, then, asymmetric certainty was highest when both the target of questions and the target of inference were stereotyped (*M* = 37.14), lowest when both the target of questions and the target of inference were nonstereotyped (*M* = –3.75), and intermediate when either target of inference or target of questions was stereotyped (*M* = 16.52).[2]

These findings support our hypothesis that both the content of the questions addressed to stereotyped targets and the manner in which the answers to these questions are processed contribute to the asymmetric certainty of inferences about stereotyped targets. Whether the target of inference was stereotyped or nonstereotyped, questions that were initially addressed to stereotyped targets led participants to infer the stereotyped attitude with greater certainty from confirming answers than from disconfirming answers. This asymmetric certainty was relatively small when the questions were initially addressed to nonstereotyped targets. Moreover, whether the questions were initially addressed to stereotyped or nonstereotyped targets, answers from stereotyped targets led participants to infer the stereotyped attitude with greater certainty than did answers from nonstereotyped targets. As a result, asymmetric certainty was greater when the target of inference was stereotyped rather than nonstereotyped.

GENERAL DISCUSSION

In many real-life situations, perceivers have the opportunity to address questions to others before making judgments about their per-

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2. Reflecting these results, a MANOVA on the component attitude probabilities with confirming versus disconfirming answers yielded the expected Answers x Target of Questions interaction, $F(1, 42) = 11.34, p = .002, \eta^2 = .21$, and Answers x Target of Inference interaction, $F(1, 42) = 43.54, p .001, \eta^2 = .51$.

sonal characteristics. The present research investigates how stereotypes affect judgments about others in such situations. Participants were free to ask any question they thought would help them make an accurate judgment about a target person's attitudes. Despite this opportunity to acquire individuating information, participants' judgments were strongly influenced by their stereotypes. Both Study 1 and Study 2 found greater asymmetric certainty in inferences about stereotyped targets than nonstereotyped targets. That is, participants' certainty in the stereotype–consistent attribute given confirming answers relative to their certainty in the stereotyped–inconsistent attribute given disconfirming answers was greater for stereotyped targets than for nonstereotyped targets.

Both the use of stereotype–biased questions (biased information search) and stereotype–biased processing of the answers (biased information processing) may contribute to this difference in asymmetric certainty. In Study 1, the target of inference was the same as the target of questions. Hence, the greater asymmetric certainty of inferences about stereotyped targets could be due to the use of stereotype–biased questions, stereotyped processing of the answers, or both. Study 2 separated these two sources of asymmetric certainty. The results found that asymmetric certainty was greater when answers came from stereotyped targets than when they came from nonstereotyped targets. This finding is consistent with a considerable amount of research showing that group stereotypes bias inferences from information about individual group members, so that the same information leads to stronger inferences of stereotype–consistent attributes when the information pertains to a member of a stereotyped group than a nonstereotyped group (e.g., Darley & Gross, 1983; Devine, 1989; Duncan, 1976; Dunning & Sherman, 1997; Kunda & Sherman–Williams, 1993).

Moreover, Study 2 provides the first demonstration of the contribution of biased information search to stereotyped judgments about individual group members. We found that inferences about both stereotyped and nonstereotyped targets were more asymmetric when the inferences were based on questions addressed to stereotyped targets. The influence of stereotype–biased questions is clearest when the target of inference is a nonstereotyped person. Participants made stronger inferences about a nonstereotyped person from confirming answers than from disconfirming answers to questions initially addressed to a stereotyped person. As a result, participants ended up

believing that this target was more likely to hold a stereotype–consistent attitude than a stereotype–inconsistent attitude when their inferences were based on questions that had been initially addressed to stereotyped targets. Thus, the kind of questions participants addressed to stereotyped targets was sufficient to make a nonstereotyped person seem to possess the characteristics that are associated with stereotyped groups.

As argued before, this bias is a direct consequence of the asymmetric nature of the questions that perceivers address to stereotyped targets. Such questions concern relatively extreme manifestations of the attribute in question. Confirming answers, therefore, are more diagnostic than disconfirming answers. For example, when testing whether a target person is politically conservative, the question "Do you favor eliminating income tax?" is asymmetric: A confirming answer diagnoses a conservative person with a high degree of certainty, because only conservatives are likely to endorse eliminating income tax. A disconfirming answer, however, affords little certainty regarding the target's attitudes, because liberals, as well as many conservatives, are likely to disagree with this policy. In the extreme case, the confirming answer has a high diagnostic value whereas the disconfirming answer has no diagnostic value.

Asking asymmetric questions, therefore, is a risky information search strategy. Such questions afford either high certainty or little certainty about a target person's characteristics. Stereotypes, however, reduce the subjective risk of using this strategy by rendering the confirming answer subjectively more probable. For example, perceivers may think of CEOs as conservative and therefore as likely to provide the highly diagnostic confirming answer to the question "Do you favor eliminating income tax?" A nonstereotyped person (e.g., a housekeeper) is seen as less likely to provide this answer. We propose, then, that perceivers address more asymmetric questions to stereotyped targets than to nonstereotyped targets because, from the perceivers' point of view, asymmetric questions have a higher expected diagnostic value for stereotyped persons.

This analysis has important implications regarding the influence of accuracy incentives on stereotyping. From the present viewpoint, accuracy incentives may not necessarily reduce stereotyping. Consider first how accuracy incentives might affect information search. When a list of stereotype-confirming and stereotype-disconfirming questions is externally provided, accuracy incentives might lead in-

dividuals to select a more balanced set of questions from the list (see Johnston, 1996). However, when questions are freely generated, accuracy incentives may alert perceivers to diagnosticity considerations—to the amount of new information they could gain from their questions—rather than to the need to be even–handed. Because, as argued here, asymmetric questions are expected to yield more new information when addressed to stereotyped targets, accuracy incentives may act to promote this diagnostic strategy. It is possible, then, that it is when perceivers have little incentive to be accurate that they cease to address more asymmetric questions to stereotyped targets than to nonstereotyped targets.

Accuracy incentives, however, may have a different influence on the processing of the answers to questions addressed to group members. Diagnosticity considerations require that the weight of prior expectancies should decrease as the amount of new individuating information increases (see Ginossar & Trope, 1987; Trope & Liberman, 1996). Indeed, a considerable amount of research suggests that this is what perceivers actually do when they have strong incentives to make accurate judgments and are provided with individuating information about a target person (e.g., Brewer, 1988; Fiske & Neuberg, 1990). It is possible, then, that accuracy incentives have opposite effects on stereotype–biased information search and information processing. Accuracy incentives may increase stereotype–biased information acquisition, but decrease stereotype–biased processing of the acquired information. When perceivers are provided with fixed individuating information, accuracy incentives may attenuate and even eliminate stereotyping. However, when perceivers can freely seek information about target persons, the overall effect of accuracy incentives may depend on how much accuracy incentives increase stereotyped–biased information search compared to how much accuracy incentives decrease stereotype–biased information processing. When accuracy incentives are more prominent during information processing, they are likely to diminish stereotyping. But when accuracy incentives are equally or more prominent during information search, they may have no effect or even augment stereotype–biased judgments.

Similar considerations apply to the influence of cognitive resources on stereotyping. Such resources may enable perceivers to use the incoming individuating information about a target person and properly decrease the weight of stereotypes on their judgment

(e.g., Bodenhausen, 1990; Gilbert & Hixon, 1991; Osborne & Gilbert, 1992; Pendry & Macrae, 1994; Pratto & Bargh, 1991; Stangor & Duan, 1991). At the preceding information search stage, however, processing resources may enable perceivers to assess the diagnostic advantage of asymmetric questions for stereotyped persons and formulate such questions. Cognitive resources may thus decrease stereotyped information processing, but increase stereotyped information search. Like accuracy incentives, cognitive resources may therefore diminish, have no effect, or augment stereotyping, depending on whether their effect on information processing is greater, equal to, or smaller than their effect on information search. An interesting direction for future research, then, is to use the present paradigm of separating target of questions and target of inference for assessing the independent effects of accuracy incentives and cognitive resources on stereotype–biased information search and stereotype–biased information processing.

In sum, the present studies suggest that providing people with the opportunity to freely seek individuating information about others may increase rather than decrease stereotyping. Earlier research found that the *amount* of information people seek about stereotyped group members is relatively small (see Trope & Thompson, 1997). The present studies further show that the *type* of information one seeks about stereotyped group members is biased against disconfirmation of one's stereotypes. Together, these studies suggest that important requirements for reducing stereotyping—exposure to a large amount of individuating and diagnostic stereotype–inconsistent information—are unlikely to be met when people have control over their exposure to information about others. Biased information search may therefore constitute a major impediment to the reduction of stereotyping in everyday life situations.

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