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It's in the Mind of the Beholder: The Impact of Stereotypic Associations on Category-Based and Individuating Impression Formation

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Abstract

The present research investigates the influence of individual differences in the strength of stereotypic associations on category-based and individuating impression formation. In Experiments 1a and 1b, a target's category membership affected the ascription of stereotypical traits only when perceivers had strong stereotypic associations (measured with an Implicit Association Test, A. G. Greenwald, D. E. McGhee, & J. K. L. Schwartz, 1998). For perceivers with weak associations, in contrast, impressions varied only as a function of individuating information. Employing a multinomial model for the "Who said what?" paradigm (K. C. Klauer & I. Wegener, 1998), Experiment 2 demonstrated that these effects are due to increased stereotyping and decreased individuation for perceivers with strong stereotypic associations, rather than to individual differences in the likelihood of social categorization. Implications for the relations between categorization, stereotyping, and individuation are discussed.

When people form impressions of others they can infer personal dispositions either from a target's social category membership or from his or her specific behaviors. A male target, for example, might be judged aggressive because he is a skinhead, or because he has been actually observed behaving aggressively. Drawing on this distinction between category-based and individuating impressions, major theories of interpersonal perception assume that perceivers usually give priority to category information over individuating information (e.g., Brewer, 1988; Fiske & Neuberg, 1990). Fiske and Neuberg (1990), for example, claim that when people encounter another person they routinely categorize that person in terms of salient features such as gender, race, or age. If the target is of at least some relevance for the perceiver, attention will be paid to individuating attributes of the target (e.g., behavior), integrating these in a process of confirmatory categorization. This process is assumed to succeed if available information is perceived to be consistent or non-diagnostic with respect to the activated category. If, however, available information is inconsistent with the initial category, the target must be recategorized by accessing a subtype or a new category. If recategorization does not lead to a coherent impression of the target, attributes are scrutinized one-by-one, resulting in a so-called piecemeal integration process. Accordingly, impression formation can be placed on a continuum ranging from category-based to individuating processes, depending on the categorical fit of the available information and the perceiver's cognitive elaboration of that information (see also Fiske, Lin, & Neuberg, 1999).

Drawing on recent evidence for individual differences in automatic stereotype activation (e.g., Fazio, Jackson, Dunton, & Williams, 1995; Kawakami, Dion & Dovidio, 1998; Lepore & Brown, 1997; Wittenbrink, Judd, & Park, 1997), the present research was designed to test whether the relative influence of category and individuating information on impression formation is moderated by the strength of stereotypic associations. Specifically, it was assumed that social categorization leads to stereotype activation if, and only if, perceivers

have strong associations between the activated category and its stereotypic connotations (Stangor & Lange, 1994). Hence, a social category should be diagnostic only for perceivers with strong stereotypic associations, but not for perceivers with weak associations. Since a target's category membership, in turn, should have no impact on impression formation when it is non-diagnostic (Krueger & Rothbart, 1988), category information can be expected to affect impression formation only when stereotypic associations are strong, but not when they are weak.

Even though this prediction may be intuitively plausible, it is much less obvious how strength of stereotypic associations may affect the impact of individuating information. This largely depends on how the relative influence of the two kinds of information is conceptualized (Bodenhausen, Macrae, & Sherman, 1999). On the one hand, the use of category and individuating information could be reciprocally related. In this case, individuating information should have a greater influence for perceivers with weak associations compared to those with strong associations. On the other hand, the influence of individuating information could be independent of the impact of category information. In this case, individuating information can be expected to affect perceivers' impressions regardless of the strength of stereotypic associations.

Experiments 1a and 1b

The main objective of Experiments 1a and 1b was to investigate the effects of the strength of stereotypic associations on category-based and individuating impression formation. For this purpose, participants of two conceptually identical experiments watched a videotaped interview of either a male or a female target about a gender-unrelated topic. In Experiment 1a, this interview was terminated by the target claiming either that he or she has to pick up his or her children from the kindergarten (domestic responsibility), or that he or she

has an urgent business appointment (work responsibility). In Experiment 1b, the interview was terminated by the target claiming either that he or she has to go to the supermarket, since his or her children were coming home from school shortly (domestic responsibility), or that he or she has to go to work (work responsibility). After watching the videotape, participants were asked to rate the target on several gender-stereotypical traits related to career and household. Finally, individual differences in associative strength between the concepts men and career on one hand, and women and household on the other were assessed using an adaptation of Greenwald, McGhee, and Schwartz's (1998) Implicit Association Test.

Method

Participants and Design

A total of 122 students (70 female) took part in one of two conceptually identical studies ostensibly concerning the psychological consequences of recent changes in a particular neighborhood in Berlin, Germany (Berlin-Mitte). Participants in Experiment 1a (N = 59) received credit for research participation requirements; participants in Experiment 1b (N = 63) were paid 10,- DM (~US-$ 5). Both experiments consisted of a 2 (category information: male vs. female target) x 2 (individuating information: domestic responsibility vs. work responsibility) x 2 (associative strength: strong vs. weak) factorial design. Participants in each experiment were randomly assigned to one of the four experimental conditions implied by the manipulations of category and individuating information. Associative strength was introduced quasi-experimentally by a median-split of an implicit gender-stereotype measure (IAT). Experimental sessions were run individually. Data from three participants were excluded from analyses. One participant questioned the authenticity of the interview; one knew the target in the interview; and one exhibited an IAT-score of more

than 5.8 standard deviations higher than the mean of the total sample. This removal did not change the overall pattern of results.

Procedure

On arrival, participants were welcomed and informed that they were taking part in a study concerning the psychological effects of recent changes in Berlin-Mitte. The experimenter explained that a number of short interviews with inhabitants of Berlin-Mitte were conducted, and that each participant would watch one of the videotaped interviews. Videotapes were then randomly assigned by drawing lots. The clips began with a documentary about recent changes in Berlin-Mitte. The second part of the videotape consisted of a short sequence in which a female interviewer approached either a male or a female passerby (a confederate of the experimenters), asking if he or she had some time for a short interview concerning recent changes in Berlin-Mitte. After a few scripted, gender-unrelated questions (e.g., age, living in Berlin-Mitte, time of living there, liking living there, and personal opinions concerning recent changes in Berlin-Mitte) the target person terminated the interview. In Experiment 1a, the termination was excused either by the claim to have to pick up his or her children from the kindergarten (domestic responsibility), or by the claim to have an urgent business appointment (work responsibility). In Experiment 1b, targets claimed either to have to go to the supermarket since the children were coming home from school shortly (domestic responsibility), or to have to go to work (work responsibility). The interview and the behavior of targets were highly scripted, and thus can be regarded as identical within each of the two experiments. Targets in Experiment 1a were dressed in winter clothes; targets in Experiment 1b wore summer clothes. Clothing of the targets was ambiguous with respect to professional or informal dress and comparable in styling and color.

After watching the videotape, participants were asked to respond to a short questionnaire containing a number of questions about the target's opinion on recent changes in Berlin-Mitte and his or her personality. After completion of the questionnaire, they were administered an Implicit Association Test (Greenwald et al., 1998) to assess participants' gender-stereotypic associative strengths. Finally, participants were probed for suspicion, debriefed, and thanked for participation.

Measures

Implicit Association Test. To assess participants' idiosyncratic associative strengths between the concepts men and career on one hand, and women and household on the other, an Implicit Association Test (Greenwald et al., 1998) was used. The IAT was implemented on 486 IBM-compatible computers using the software Experimental Run Time System, ERTS (Beringer, 1994). Following Greenwald et al. (1998), the IAT consisted of five blocks. In the initial target-concept discrimination task (Block 1), 10 male names (e.g., Georg, Bernhard) and 10 female names (e.g., Elisabeth, Caroline) had to be assigned to the categories "man" or "woman", respectively. Participants were asked to press a left-hand key ("a") when a male name appeared on the screen, and a right-hand key ("5" of the number block) in the case of a female name. In the attribute discrimination task (Block 2), 10 career-related nouns (e.g., economy, salary) and 10 household-related nouns (e.g., children, kitchen) were presented and had to be classified according to the categories career (left-hand key) and household (right-hand key). In the initial combined task (Block 3), target and attribute discrimination trials were presented in alternating order. Participants had to press the left-hand key when either a male name or a career-related noun was presented, and the right-hand key when a female name or a household-related noun was presented. In the reversed target-concept discrimination task (Block 4), the initial target-concept discrimination was repeated with a

switch of the categorization keys. The reversed combined task (Block 5) again combined the two individual tasks, now in a stereotype-inconsistent manner. Participants had to press the left-hand key when either a female name or a career-related noun was presented, and the right-hand key when a male name or a household-related noun was presented. Each block started with a short instruction of the following task and a request to respond as fast as possible even if this would lead to errors. The three discrimination tasks (Blocks 1, 2, and 4) each consisted of a total of 40 trials. The two combined tasks (Blocks 3 and 5) each comprised 120 trials (60 names, 60 nouns). The same randomized order of trials was used for all participants. The response-stimulus interval following correct responses was 250 ms. Wrong responses were indicated with the word "FEHLER!" (German word for "Error") appearing for 1000 ms below the center of the screen.

Trait-Ratings. To assess participants' impressions of the target, they were asked to rate the interviewee on twelve gender-stereotypical traits related to career (e.g., independent, assertive) or household (e.g., domestic, provident) on five-point scales ranging from 1 (= not true) to 5 (= true). In addition, a number of gender-neutral positive and negative filler traits (e.g., tolerant, humorous) were included to prevent suspicion about the true purpose of the experiment.

Results

Implicit Association Test

Response latencies higher than 3000 ms were replaced by this value, latencies lower than 300 ms were recoded to missing values. Error trials were excluded from analyses. Individual IAT-scores were calculated by subtracting mean response times of the initial combined task (Block 3) from the mean latencies of the reversed combined task (Block 5). This score was interpreted as an index for participants' idiosyncratic associative strengths

between the concepts men and career on one hand and women and household on the other, with higher scores indicating stronger stereotypic associations. Collapsing Experiments 1a and 1b, IAT-scores ranged from –207.56 ms to 579.79 ms (M = 127.08, SD = 107.81). There was no significant difference between male and female participants (M_{male} = 129.33, M_{female} = 125.50), t(56) = -.19, ns. Since there were also no reliable effects of perceivers' gender on any of our dependent measures this variable is dropped from further discussion. In order to calculate the reliability of the IAT, the two combined blocks were each divided into three parts of equal length (i.e., 40 trials). The three thirds were then used to calculate three IAT-scores for each participant. The internal consistency of these scores was .80 (Cronbach's α). To obtain groups with weak and strong associations, the total sample was divided by a median-split (MD = 106.49). Again collapsing Experiments 1a and 1b, participants with strong (M = 202.18; SD = 95.43) and weak (M = 53.22; SD = 55.73) associations were distributed approximately uniformly over the four experimental conditions with ns ranging from 13 to 17.[1]

Trait Ratings

Stereotypical trait ratings were merged into a single index of communal versus agentic orientation (Cronbach's α = .79) by reverse scoring the traits related to career. Hence, high values indicate higher ratings of communal orientation and lower ratings of agentic orientation. For the sake of simplicity, we refer to the index as communal orientation, rather than as communal versus agentic orientation. This index was submitted to a 2 (Experiment: 1a vs. 1b) x 2 (category information: male vs. female target) x 2 (individuating information: domestic responsibilities vs. work responsibilities) x 2 (associative strength: strong vs. weak) analysis of variance (ANOVA). This analysis revealed neither a significant main nor any interaction effect of the experiment factor. Furthermore, the pattern of results was identical in

the two experiments, and thus all of the results reported below can be interpreted as being replicated across the two experiments.

A significant main effect of the target's gender, F (1, 103) = 12.50, $p < .01$, indicated that male targets were rated lower in communal orientation (M = 2.62) than female targets (M = 2.91). Additionally, a significant main effect of individuating information indicated that targets with domestic responsibilities were rated higher in communal orientation (M = 3.01) than targets with work responsibilities (M = 2.52), F (1, 103) = 34.50, $p < .001$. These main effects were qualified by a significant two-way interaction of category and individuating information, F (1, 103) = 4.67, $p < .05$, indicating that the impact of individuating information was greater for female targets (M_{work} = 2.58; $M_{domestic}$ = 3.25) than for male targets (M_{work} = 2.45; $M_{domestic}$ = 2.77). Consistent with our prediction of a moderating effect of associative strength on the impact of category information, a significant two-way interaction of category information and associative strength indicated that the targets' gender affected perceivers' impressions only when stereotypic associations were strong (M_{man} = 2.44; M_{woman} = 2.94), but not when associations were weak (M_{man} = 2.80; M_{woman} = 2.89), F(1, 103) = 6.03, $p < .05$. Inconsistent with the possibility of a moderating effect of stereotypic associations on the impact of individuating information, there was no significant interaction between associative strength and individuating information ($F < 1$). Unexpectedly, however, these effects were further qualified by a significant three-way interaction of category information, individuating information, and associative strength, F(1, 103) = 9.70, $p < .01$ (see Figure 1). To specify this interaction, separate analyses were conducted for participants with strong and weak associations, respectively.

For participants with weak associations, a 2 (Experiment: 1a vs. 1b) x 2 (category information: male vs. female target) x 2 (individuating information: domestic responsibilities vs. work responsibilities) analysis of variance (ANOVA) revealed a significant main effect of

individuating information, F (1, 52) = 26.81, $p < .001$, indicating that the targets were rated higher in communal orientation when they had domestic responsibilities than when they had work responsibilities (M_{work} = 2.56; $M_{domestic}$ = 3.09). Most importantly, neither the main effect of category information nor its interaction with individuating information reached statistical significance (all Fs < 1).

For participants with strong associations, the same analysis of variance revealed a significant main effect of category information, F (1, 51) = 15.27, $p < .001$. As expected, male targets were rated lower in communal orientation than female targets (M_{man} = 2.44; M_{woman} = 2.94). Additionally, a significant main effect of individuating information indicated that targets were rated higher in communal orientation when they had domestic responsibilities than when they had work responsibilities (M_{work} = 2.48; $M_{domestic}$ = 2.92), F (1, 51) = 10.82, $p < .01$. These main effects, however, were qualified by an unexpected two-way interaction of category and individuating information, F (1, 51) = 11.84, $p < .01$. Whereas male targets were rated relatively low in communal orientation regardless of their account for terminating the interview (M_{work} = 2.45; $M_{domestic}$ = 2.43), female targets were rated higher in communal orientation when they had domestic responsibilities than when they had work responsibilities (M_{work} = 2.51; $M_{domestic}$ = 3.38).

Discussion

Results from Experiments 1a and 1b confirm the prediction that category information affects impression formation only for individuals with strong associations between the category in question and its stereotypic content. Consistent with this assumption, we found that a target's gender affected the attribution of communal versus agentic traits only for participants with strong gender-stereotypic associations. Perceivers with weak associations, in contrast, were unaffected by the gender of the target. Furthermore, strength of stereotypic

associations did not moderate the impact of individuating information on target ratings. That is, both "strongs" and "weaks" were affected by the explanation the target offered for terminating the interview. Most importantly, this was true even though their impressions were differentially affected by category information. Taken together, these results offer evidence that the impact of category and individuating information is not necessarily reciprocally related. In contrast, both kinds of information seem to affect impression formation independently of one another without increasing or decreasing each other's impact (e.g., Bodenhausen et al., 1999; Brewer & Harasty-Feinstein, 1999; Wolsko, Park, Judd, & Wittenbrink, 2000).

However, even though these results may seem straightforward at first glance, there was also an unpredicted three-way interaction of category information, individuating information, and associative strength. In particular, "weaks" rated targets generally lower in communal orientation when they had work responsibilities than when they had domestic responsibilities. "Strongs", in contrast, rated male targets relatively low in communal orientation regardless of their explanation for terminating the interview. Female targets, however, were rated higher in communal orientation when they had domestic responsibilities than when they had work responsibilities. This result might point to a subtyping process initiated by the particular kind of individuating information used in the two studies (see Johnston & Hewstone, 1992; Kunda & Oleson, 1995; Weber & Crocker, 1983). Specifically, our variation of individuating information seems to be asymmetrically susceptible to interpretation by the participants. Whereas work responsibilities might unambiguously suggest having a full time business job for both male and female targets, domestic duties might be more ambiguous since they could indicate either a regular activity or one that is done in addition to a career. Accordingly, the interpretation of the "domestic cues" could have been affected by the context information about the targets' gender (e.g., Dunning & Sherman,

1997; Kunda & Sherman-Williams, 1993; see also Trope, 1986). More precisely, perceivers with strong stereotypic associations might have interpreted domestic responsibilities as belonging to a female target's regular activity, but as being an occasional chore for a male target. Work responsibilities, in contrast, might suggest a full time business job for both male and female targets. Hence, a male target might have been categorized as a "typical man" regardless of his reason for terminating the interview. A female target, however, might have been categorized as a "typical woman" when she had domestic responsibilities, but as a "career woman" when she had work responsibilities (see Eckes, 1994; Edwards, 1992).

Note, that this theorizing particularly focuses on the impression formation process of perceivers with strong stereotypic associations. According to our initial reasoning about the differential diagnostic value of social categories, correspondent processes of perceivers with weak associations should be different. Since for these participants a target's gender can be expected to be non-diagnostic – and hence ambiguous – they should neither use this kind of information in general (Krueger & Rothbart, 1988), nor in particular to disambiguate ambiguous behavior in the way described (Trope, 1986). Rather, these participants can be expected to base their impressions only on individuating information irrespective of the social category of the target. In fact, this is what we have found.

Generally speaking, it seems that "strongs" integrate individuating information in a confirmatory manner when it is – in their eyes – consistent with the stereotype activated by the social category. However, they seem to recategorize the target when this information is clearly inconsistent with the stereotype (Fiske & Neuberg, 1990). For "weaks", in contrast, the category membership of the target has no diagnostic value, thus offering no possibility to use this kind of information to form an impression (Krueger & Rothbart, 1988). Hence, perceivers with weak associations may directly attend to individuating information which is, in fact, the only kind of useful information for them.

Categorization, Stereotyping, or Individuation?

According to the assumption outlined in the introduction, both "strongs" and "weaks" generally categorize targets in terms of salient characteristics (e.g., gender, race, age). Because of their differing associations, however, these categorizations have a differential impact on the activation of stereotypic content, and thus on the impression that is formed of the target (Stangor & Lange, 1994).

Alternatively, it can be argued that perceivers with weak associations do not even categorize the target in terms of his or her category membership. According to this assumption, the obtained differences would reflect differential categorization rather than differential stereotyping. Consistent with this possibility, Fazio and Dunton (1997), for example, demonstrated that categorization in terms of black and white skin color varies as a function of the strength of evaluative associations linked with African Americans. These results suggest that associative strength can affect the chronic accessibility of the category, and thus its use for categorization (Bargh, Bond, Lombardi, & Tota, 1986).

Yet another possibility implied by the present interpretation of the obtained results is that perceivers with weak associations elaborate individuating information more thoroughly than perceivers with strong associations. Consistent with the informational fit assumptions made by the continuum model (Fiske & Neuberg, 1990), "strongs" may recategorize the target when individuating information is clearly inconsistent with the implications of the activated stereotype. However, they may expend less effort to elaborate individuating information when it is perceived as consistent with the stereotype. "Weaks", in contrast, may directly attend to individuating information irrespective of the (subjectively non-diagnostic) social category membership of the target (see also Brewer & Harasty-Feinstein, 1999).

In Experiment 2, it was therefore tested whether the obtained effects are due to individual differences in (a) individuation, (b) categorization, (c) stereotyping, or (d) a particular combination of the three processes.

Experiment 2

A convenient method to investigate differences in social categorization is the so-called "Who said what?" paradigm developed by Taylor, Fiske, Etcoff, and Ruderman (1978). In this experimental procedure, participants observe a simulated group discussion between members of two different social categories (e.g., men and women), each making a number of statements. Afterwards, a surprise memory task is administered in which participants are asked to reassign each statement of the discussion to its speaker. Provided that memory is less than perfect, the original speaker often cannot be remembered. Still, there may be partial memory for his or her category membership (e.g., "I know it was a woman who said it."). Such partial memory for a speaker's category membership will usually result in relatively more confusion errors within a category than between categories. The difference (or the ratio) of these two kinds of erroneous assignments is thus regarded as a measure of the amount of categorization that took place in perceiving and mentally organizing the discussion group.

This interpretation, however, has recently been criticized by Klauer and Wegener (1998) for confounding social categorization with a number of different memory and guessing processes involved in the assignment task. To solve this interpretational ambiguity, they proposed a slight modification of the assignment phase by adding distracter statements which were not part of the original discussion. When reassigning the statements, participants are first asked to decide whether a particular item is old or new, and they have to assign it to a speaker only if they indicate that it has been presented during the discussion. This modification provides a richer data base, allowing one to disentangle the relative contribution

of the different processes underlying the responses by means of a multinomial model of source discrimination (see Batchelder & Riefer, 1999, for a review). In such a model, each latent cognitive process is assessed by a separate parameter reflecting the probability of the corresponding process to occur. The ensemble of processes underlying the assignment behavior and accounted for in the multinomial model proposed by Klauer and Wegener (1998) can be described as follows:

(a) Item discrimination reflects memory for the statements themselves, that is, the ability to identify an item as old or new. Identifying old statements correctly as old reflects recognition processes, which are represented by the model parameter D. Distracters can be detected as new by means of so-called auto-noetic processes (Strack & Bless, 1994), which can be circumscribed by a feeling of negative familiarity (e.g., "If this statement would have been presented, I would certainly remember it."). Distracter detection is captured by the model parameter D_N. This class of processes is, for example, affected by the similarity between old and new items (Klauer & Wegener, 1998, Experiment 2) or by cognitive load during encoding (Klauer & Wegener, 1998, Experiment 6).

(b) Guessing of item status takes place if item memory fails, such that an old statement cannot be remembered or a distracter is not detected as such. The model parameter b reflects the probability to guess that an item is old rather than new, and is, for example, affected by the proportion of old items relative to distracters (Klauer & Wegener, 1998, Experiment 1).

(c) Person memory refers to the ability to remember the statement's actual speaker, given the statement itself has been recognized as old. This process requires memory for the speaker's individuating features, and the corresponding model parameter c therefore reflects the amount of individuation. Person memory is, for example, affected by the

(perceived) interpersonal similarity between the discussants (Klauer & Wegener, 1998, Experiment 5).

(d) Person guessing. If the correct speaker cannot be remembered, there is also the possibility to correctly choose him or her by chance if the correct category was remembered or guessed (see below). This option is accounted for by a fixed probability 1/n, with n being the number of members within the respective category.

(e) Category memory reflects the process of correctly remembering the speaker's social category membership, given that the statement is correctly recognized as old, but person memory fails. This process mirrors the idea of partial memory indicating social categorization, and is modeled by the model parameter d. The amount of category memory is, for example, sensitive to a category's chronic or situational accessibility (Klauer & Wegener, 1998, Experiment 3).

(f) Category guessing assesses the tendency to choose a speaker from one social category over the other, if there is neither memory for the speaker nor for his or her category affiliation. The preference to assign a given statement to a member of Category A rather than B is captured by the model parameter a. Conversely, the preference for Category B rather than A is given by the complementary probability 1-a. Such assignment tendencies can, for example, emerge from stereotypic beliefs (Klauer, Wegener, & Ehrenberg, in press) associating the content of a given statement with a specific category membership (e.g., "Only a woman would say something like that.").

Whereas category memory can be interpreted as an indicator of spontaneous social categorization, the other parameters reflect different, though relevant processes involved in the assignment task.[2] Applied to the present investigation, the extended version of the "Who-said-what?"-paradigm enables one to distinguish between the proposed explanations for the obtained effects in terms of individual differences in (a) individuation, (b) categorization, (c)

stereotyping, or (d) a particular combination of the three. If individuals with weak associations differ from those with strong associations in the individuation of a target, "weaks" and "strongs" can be expected to differ in their level of person memory. That is, "weaks" should have generally better memory for the actual speaker of a statement than "strongs". If, however, differential impressions are due to differences in categorization, "weaks" and "strongs" can be expected to differ in their level of category memory. That is, "strongs" should have generally better memory for the speakers' category memberships than "weaks". Finally, if the obtained results are due to association-based stereotyping of the targets, "weaks" and "strongs" can be expected to differ in the extent to which they rely on stereotypic expectancies in assigning statements under uncertainty. That is, given memory neither for the actual speaker nor for his or her category membership, "strongs" should make more stereotype-consistent than stereotype-inconsistent assignments of stereotype-relevant statements in category guessing. For "weaks", in contrast, this effect should be relatively small or even absent.

Method

Overview

Participants watched a simulated discussion between four women and four men about gender-roles in intimate relationships and society as a whole. After the presentation, participants were again presented all the statements mixed with distracter statements, and asked to distinguish between statements of the discussion and new statements that were not mentioned in the discussion. If a statement was classified as having occurred during the discussion, participants were asked to assign it to the actual speaker. After they had finished this recognition task, participants completed the Implicit Association Test (Greenwald et al., 1998) already used in Experiments 1a and 1b.

Participants

A total of 60 students (30 female) from various Berlin Universities were recruited for a study on impression formation. Psychology students received credit for experiment participation requirements, non-psychology students received a cinema voucher (cash value: 14,- DM, ~ US-$ 7).

Procedure

On arrival, participants were welcomed and seated in front of a personal computer. Instructions on the screen indicated that they were to watch a discussion between a number of people talking about the role of men and women in intimate relationships and in society at large. The participants' task was to form an impression of the group as a whole. Participants were then presented 48 statements about gender-roles in intimate relationships and society. Statements expressed either a conservative or a progressive attitude towards the subject and each speaker made 3 conservative and 3 progressive statements. Conservative and progressive statements were constructed in comparably worded pairs, so that for each statement there was a parallel one expressing the opposite attitude towards the same or a very similar aspect. For example, the progressive statement "It is most natural that a husband has to iron his shirts himself" has the conservative counterpart in "It is somewhat strange if a husband has to iron his shirts himself". Thus, the two kinds of statements did not differ in semantic content except for the attitude expressed. No opposing statements were shown to the same participant. Statements were categorized into six topics (i.e., child care, job and finances, organization of leisure time activities, sharing of domestic work, partnership and faithfulness, gender specific accessories), and each speaker contributed one statement on each of these domains. This was done in order to prevent participants from perceiving discussants as holding contradictory

views on very similar issues. Each statement was accompanied by the presentation of a portrait photo of one of the 8 speakers (4 male, 4 female). Which statements from the overall pool were presented during the discussion or as distracters was determined randomly for each participant anew, as was the matching between statements and speakers (respecting the restrictions mentioned above). Also, the order of statements was randomized separately for each participant, with the restriction that speakers made their statements in turns. That is, in a first round, all speakers gave their first statement, in a second round each gave his or her second statement, and so on. The order of speakers was randomized within each round anew. Statement-photo pairs appeared on the screen for 6 s with an inter-trial interval of 1 s. Simulated discussions thus consisted of a total of 48 statement-photo pairs with each discussant making 6 statements. When the simulated discussion was over, participants were unexpectedly asked to reassign each statement to its speaker. To this end, the 48 old and 48 new statements individually appeared on the screen in random sequence and had to be classified as “old” or “new” by mouse clicks on respective fields. If an item was classified as “new”, the next item appeared on the screen. If an item was classified as “old”, the portrait-photos of the 8 discussants appeared on the screen in random collocation. Participants were asked to indicate which of these 8 individuals had actually made the statement by clicking on his or her photo. After the assignment, the next statement appeared on the screen to be classified as “old” or “new”. When participants had finished this recognition task, they were asked to complete the Implicit Association Test (Greenwald et al., 1998) already used in Experiments 1a and 1b. They were then probed for suspicion, debriefed, and thanked for participation.

Results

Implicit Association Test

IAT-scores were calculated according to the procedure described for Experiments 1a and 1b. Scores ranged from -150.35 ms to 399.54 ms (M = 140.46, SD = 103.68). There was no significant difference between male and female participants (M_{male} = 161.65, M_{female} = 119.26), t(58) = -1.60, ns. Since there were no reliable effects of perceivers' gender on any of our dependent measures, this variable is dropped from further discussion. The reliability of the IAT was calculated according to the procedure described for Experiments 1a and 1b, revealing an internal consistency of .75 (Cronbach's α). The sample was divided by a median-split (MD = 142.14), obtaining groups with weak (M = 61.35; SD = 65.28) and strong associations (M = 219.67; SD = 68.27).

Who-Said-What?

Data from one participant who classified almost half of the distracter statements as old were excluded from the analyses. Excluding these data did not change any of the parameter estimates except those for distracter detection. The structure of the multinomial model (see Klauer & Wegener, 1998) was quadrupled in order to provide parameter estimates for each of the four experimental conditions. That is, the model was fitted simultaneously for participants with strong versus weak stereotypic associations as between-participants factor and for kind of statement (progressive vs. conservative) as a within-participants factor. To ensure that the parameters could be properly estimated some restrictions had to be imposed on the model for technical reasons (see Klauer & Wegener, 1998). In particular, one distracter detection parameter had to be set equal to one of the item recognition parameters, and b-parameters (i.e., guessing old vs. new) had to be set equal across all conditions. These restrictions are

standard restrictions in multinomial modeling and are widely accepted as unproblematic (Batchelder & Riefer, 1990; Bayen, Murnane, & Erdfelder, 1996; Klauer & Wegener, 1998).

In addition, a number of substantial a priori assumptions were implemented in order to simplify the model and to focus as closely as possible on the processes under investigation. Each of these simplifications was tested for empirical adequacy as reported in the preliminary analyses section (see below). First, it is assumed that there are no specific main effects of speaker's category membership (i.e., men vs. women) or kind of statement (i.e., progressive vs. conservative) on any of the three memory parameters, over and above possible consistency effects. That is, parameters for progressive statements made by women and for conservative statements made by men were set equal, resulting in a single parameter for stereotype-consistent statements, and, conversely, parameters for conservative statements made by women and for progressive statements made by men were set equal, resulting in a single parameter for stereotype-inconsistent statements. Second, it is assumed that the process parameters for item memory and distracter detection are equal to one another and can be subsumed into a single parameter for item discrimination. Third, it is assumed that this item discrimination parameter remains unaffected by the two experimental factors, namely stereotype consistency and associative strength.

This model provides estimates for: (1) one common parameter D for item discrimination, (2) one common parameter b for the probability to guess an item to be old rather than new, given item discrimination failed, and, most central here, four parameters each for (3) person memory c, (4) category memory d, and (5) stereotype-based category guessing a, all varying as a function of participants' level of associative strength (strong vs. weak) and stereotype-consistency of the statement (consistent vs. inconsistent). Note that in category guessing, the notion of consistency does not refer to the original consistency or inconsistency between a given item and a speaker's category in the discussion (as it does for the memory

processes), but to assigning a given item in a stereotype-consistent way.[3] Thus, if category guessing differs as a function of kind of statement, this indicates a preference to assign statements in a consistent rather than an inconsistent manner or vice versa. The adequacy of the present restrictions as well as the ensemble of model assumptions (see Klauer & Wegener, 1998) can be tested by the χ^2-distributed overall goodness-of-fit index of the model. The present model fits the data very well, $\chi^2(18) = 16.87$, $p = .53$, and was chosen as the baseline model for testing the central hypotheses about individual differences in individuation, categorization, and stereotyping as assessed by the respective model parameters. Probability estimates and confidence intervals for each parameter are shown in Table 1.

Within this model, hypotheses about differences in process probabilities as a function of associative strength or kind of statement can be assessed by restricting the corresponding parameters to be equal for the experimental conditions, defining the null-hypothesis. If the restricted model accounts for the data significantly worse than a model allowing for separate values, the difference is significant. This is tested through the difference in model fit between the free and the restricted model, $\Delta\chi^2$, with the number of degrees of freedom gained by the restriction.

Preliminary Analyses. Before investigating our main hypotheses, we tested the empirical adequacy of the above simplifications in which certain memory parameters were set equal. This was done by releasing each of the restrictions imposed and testing whether model fit improved significantly. First, we analyzed whether there were any main effects of target gender (i.e., men vs. women) or kind of statement (i.e., progressive vs. conservative). This tested the legitimacy of subsuming progressive statements by women and conservative ones by men in a joint parameter for ‘stereotype-consistent statements’, and correspondingly of subsuming the remaining two in a joint parameter for ‘stereotype-inconsistent statements’. We let each memory parameter differ as a function of statement type and a speaker’s gender

category. This did not yield a significant difference in model fit for any of the memory parameters ($\Delta\chi^2(4) = 3.11$, $p = .54$ for item memory; $\Delta\chi^2(4) = .52$, $p = .97$ for category memory; and $\Delta\chi^2(4) = 4.92$, $p = .30$ for person memory). These results indicate that there were no specific main effects of target gender or of kind of statement in memory, over and above possible consistency effects, which do not undermine the proposed simplification. Hence, this initial simplification is empirically adequate and was maintained.

In the next step, it was tested whether the process parameters for item memory and distracter detection could indeed be set equal. Equality of item memory and distracter detection is a common assumption made in multinomial modeling for several reasons beyond the technical one mentioned above, as both reflect item discrimination processes (Klauer & Wegener, 1998; Snodgrass & Corwin, 1988). In fact, allowing item memory and distracter detection parameters to differ from one another within each condition did not significantly improve model fit, $\Delta\chi^2(3) = 4.53$, $p = .21$, and the restriction to one common item discrimination parameter was therefore maintained as well.

Finally, it was tested whether item discrimination was indeed unaffected by level of associative strength and by stereotype consistency of the statement to be judged. Model fit improved neither when allowing for different parameters according to the statement's consistency, $\Delta\chi^2(2) = .67$, $p = .72$, nor when allowing for different parameters according to level of associative strength, $\Delta\chi^2(2) = 3.86$, $p = .15$. As expected, "strongs" and "weaks" differed neither in their overall level of item discrimination, nor was there differential item discrimination for consistent versus inconsistent statements ($\Delta\chi^2(1) = .63$, $p = .43$, for "strongs"; $\Delta\chi^2(1) = .04$, $p = .84$, for "weaks").[4] Therefore, all three assumptions incorporated in the baseline model as described above proved to be empirically adequate in individual tests, as well as when tested jointly through the model's goodness of fit test. Hence, we can now turn to testing the main hypotheses about individual differences in person memory (i.e.,

individuation), category memory (i.e., categorization), and stereotype-based category guessing (i.e., stereotyping) on the basis of this model. The estimates for the three respective parameters are shown in Table 1.

Person Memory. The extent to which participants attend to individuating information is reflected in the person memory parameter c. Specifically, the assumption that participants with weak associations individuate to a stronger extent than participants with strong associations should be reflected in better person memory for "weaks" as compared to "strongs". To rule out possible effects of stereotype consistency, we first restricted person memory for consistent and inconsistent items to be equal within both groups of participants. This restriction did not affect the model's goodness-of-fit, $\Delta\chi^2(2) = .09$, $p = .76$, indicating that there were no differences in person memory as a function of stereotype-consistency. This restriction left us with one person memory parameter for "strongs" and one for "weaks" which could be directly compared in order to test for the hypothesized main effect of associative strength. Restricting these parameters to be equal led to a significant loss of model fit, $\Delta\chi^2(1) = 4.24$, $p < .05$. Consistent with the assumption of higher individuation by "weaks" compared to "strongs", participants with weak stereotypic associations exhibited better person memory than those with strong associations. There was no significant interaction of associative strength and consistency.

Category Memory. The amount of social categorization is assessed by the model parameter d for category memory, that is, by the probability to remember a speaker's category membership given the item is recognized as old, but the speaker cannot be remembered. If the effects obtained in Experiments 1a and 1b stemmed from differential levels of categorization as a function of associative strength, participants with high IAT-scores should show better category memory than those with low IAT-scores. Such a main effect of associative strength can be tested by restricting "weaks" category memory to equal that of "strongs". Again, we

first tested whether category memory differed for consistent and inconsistent items. Testing for such a main effect of stereotype consistency required the parameters for consistent and inconsistent items within both "strongs" and "weaks" to be set equal. This restriction led to a marginally significant loss of model fit, $\Delta\chi^2(2) = 5.50$, $p = .06$, indicating somewhat better category memory for inconsistent than for consistent items. Ignoring consistency as a factor therefore did not seem to be justified here. In the next step, we tested for the theoretically more important main effect of associative strength by restricting the level of category memory exhibited by "strongs" to equal that of "weaks" over both kinds of statements simultaneously. This restriction also led to a marginally significant loss of model fit, $\Delta\chi^2(2) = 5.56$, $p = .06$. In contrast to our predictions, however, category memory tended to be higher for participants with weak associations than for those with strong associations. These main effects were qualified by a marginally significant two-way interaction, $\Delta\chi^2(1) = 3.60$, $p = .06$, as tested by decomposing the joint parameters to be a function of two main effects (see Klauer et al., in press). Contrast analyses revealed that "weaks" were able to remember the category membership of a speaker equally well regardless of the item's stereotype-consistency, $\Delta\chi^2(1) = .19$, $p = .66$. "Strongs", in contrast, showed better category memory for inconsistent than for consistent items, $\Delta\chi^2(1) = 5.31$, $p < .05$. Furthermore, their level of category memory for inconsistent items equaled that of "weaks", $\Delta\chi^2(1) = .34$, $p = .56$, while their category memory for consistent statements was significantly poorer than that of "weaks", $\Delta\chi^2(1) = 4.57$, $p < .05$.

Stereotype-Based Category Guessing. When neither the particular speaker of a statement nor his or her category membership can be retrieved from memory, participants are likely to rely on stereotypic expectancies in assigning the statements to a discussant. Hence, they should tend to assign a statement to a member of the category for which it is consistent rather than inconsistent according to their stereotypic associations. Such an effect can be

assumed to be the more pronounced the stronger stereotypic associations are. We would therefore expect a significant two-way interaction, that is, the proposed difference in tendencies towards stereotype-consistent versus stereotype-inconsistent assignments should be high among "strongs", and it should be smaller or even absent among "weaks". The category guessing parameter is here defined as the tendency to assign a given statement to a woman rather than a man (see Footnote 3). Therefore the guessing parameter for progressive statements reflects the probability of stereotype-consistent assignments, and the guessing parameter for conservative statements the probability of stereotype-inconsistent assignments. We first tested for a main effect of consistency by comparing the probability to assign a stereotype-consistent (progressive) versus a stereotype-inconsistent (conservative) item to a woman rather than a man. Setting equal the parameters for consistent and inconsistent assignments simultaneously for "strongs" and "weaks" led to a significant loss of model fit, $\Delta \chi^2(2) = 10.28$, $\underline{p} < .05$, indicating an overall consistency bias in assignments under uncertainty. Testing the parameters for consistent and inconsistent assignments for a main effect of associative strength also led to a marginally significant loss in model fit, $\Delta\chi^2(2) = 4.39$, $\underline{p} = .11$. These main effects were qualified by a two-way interaction of the predicted shape, $\Delta\chi^2 (1) = 2.56$, $\underline{p} = .05$ (one-tailed). As expected, planned contrasts revealed that "strongs" show a particularly pronounced preference for assigning statements in a stereotypically consistent rather than in a stereotypically inconsistent manner, $\Delta\chi^2(1) = 9.93$, $\underline{p} < .05$. "Weaks", in contrast, do not exhibit such a bias, $\Delta\chi^2(1) = .34$, $\underline{p} = .44$. In other words, "strongs" clearly relied on their stereotypic associations when reconstructing statement-speaker constellations under uncertainty. Participants with weak stereotypic associations, in contrast, assigned in a stereotype-consistent and stereotype-inconsistent manner with about equal probabilities, so that their guessing tendencies correctly reflected the actual zero-contingency between statement content and category membership.

Discussion

The main goal of Experiment 2 was to examine whether the effects obtained in Experiments 1a and 1b are best interpreted as being due to individual differences in individuation, categorization, stereotyping, or a particular combination of the three processes. All of these processes have been shown to influence performance in the "Who said what?" paradigm, and their relative contribution can be assessed in an unconfounded way by means of the multinomial model proposed and experimentally validated by Klauer and Wegener (1998).

First of all, participants with strong and weak stereotypic associations differed clearly in their memory for individuating features of the targets, implying individual differences in individuation. As predicted, "weaks" showed better person memory than "strongs", indicating a higher level of individuation. These results suggest that perceivers with weak stereotypic associations generally pay more attention to individuating information than perceivers with strong stereotypic associations.

Second, stereotypic associations significantly affected the process of stereotype-based category guessing, implying individual differences in stereotyping. When unable to retrieve sufficient information from memory, perceivers with strong stereotypic associations exhibited a clear preference to assign statements in a stereotype-consistent manner. Perceivers with weak associations, in contrast, did not show such a bias. Instead, they correctly reproduced the actual zero-contingency between category membership and attitude expressed in the statements. This result is of major importance since stereotype-based category guessing reflects one of the principal functions ascribed to stereotypes as cognitive structures, that is, to fill in gaps in memory reconstructively (e.g., Lenton, Blair, & Hastie, 2001). Stereotype-biased reconstruction of social situations is likely to bolster and stabilize stereotypic

knowledge structures which, in turn, should enhance their future availability and use.

Finally, there was no support for the alternative explanation that perceivers with weak stereotypic associations categorize the targets to a lesser extent in terms of the category in question. Contrary to this assumption, “weaks” tended to exhibit a higher level of category memory than “strongs”. If different levels of categorization were to be held responsible for the pattern of results obtained in Experiments 1a and 1b, category memory should have been better for “strongs” as compared to “weaks”, rather than worse.

Even though the present results for category memory may appear somewhat surprising at first glance, they offer additional evidence of how “strongs” and “weaks” might differ in their processing of individuating information. Specifically, category-memory exhibited a marginally significant two-way interaction between associative strength and stereotype-consistency, driven by a particularly bad category memory for stereotype-consistent statements among “strongs”. Drawing on a conceptual fluency perspective (e.g., Sherman, Lee, Bessenoff, & Frost, 1998), this result might go back to a particularly high conceptual fluency of stereotype-consistent individuating information for perceivers with strong stereotypic associations. That is, “strongs” have to spend less elaborative effort when processing stereotype-consistent information in relation to the respective category, as this association is one already prepared for them. This, in turn, seems to undermine their ability to recognize the categorical origin of stereotype-consistent information (Sherman et al., 1998). Furthermore, they attempt to compensate for this lack in memory by relying on their stereotypic associations in reconstructing it, which is reflected by the obtained consistency bias in stereotype-based category guessing. “Strongs” thus seem to integrate consistency on the category rather than on the person memory level, where consistency yielded no effects at all. For perceivers with weak associations, in contrast, stereotype-consistent information should not differ from stereotype-inconsistent information with respect to its conceptual

fluency in relation to the category (Sherman et al., 1998). Hence, "weaks" should have to spend equal amounts of processing resources to elaborate consistent and inconsistent information, resulting in equal category memory for both kinds of statements. In fact, one can even argue that there should actually be no effects of consistency in any of the processes involved, as consistency is simply not defined if stereotypic association are weak. Most importantly, they seem to relate both stereotype-consistent and stereotype-inconsistent information more thoroughly to the particular individual than "strongs", which is reflected by their generally higher level of person memory.

General Discussion

The main objective of the present research was to examine whether impression formation is moderated by individual differences in associative strength between a social category and stereotypic content. Drawing on recent evidence for individual differences in stereotype activation (e.g., Fazio et al., 1995; Lepore & Brown, 1997; Kawakami et al., 1998; Wittenbrink et al., 1997), we predicted and found that a target's gender affects the ascription of gender stereotypic traits only when perceivers had strong gender-stereotypic associations. For perceivers with weak associations, in contrast, impressions varied only as a function of individuating information. Furthermore, "strongs" seemed to be affected by individuating information only when this information was perceived as inconsistent with the implications of the stereotype, but not when this information was perceived as consistent. This pattern was obtained in two conceptually identical experiments using different stimulus material (Experiments 1a and 1b). Experiment 2 further demonstrated that these results are best explained in terms of individual differences in stereotyping and individuation, rather than in terms of individual differences in categorization. Whereas for perceivers with strong stereotypic associations category information leads to the activation of related stereotypic

content, implying an attribution of stereotypic traits (Experiments 1a and 1b), as well as a stereotype-consistent reconstruction of memory gaps (Experiment 2), no stereotype activation is implied when associations are weak. Furthermore, perceivers with weak associations seem to attend more thoroughly to individuating information regardless of the (subjectively non-diagnostic) social category of the target. Perceivers with strong associations, in contrast, seem to elaborate individuating information with respect to its relation to the stereotypical implications of the category. That is, they seem to spent less effort on elaborating individuating information in relation to the category when this information is perceived as consistent with the category stereotype. However, they seem to integrate this information, for example by recategorizing the target, when individuating information is clearly inconsistent with the stereotype. Moreover, the effort this takes seems comparable to the effort "weaks" have to invest for both kinds of information.

Categorization, Stereotyping, and Individuation

In general, the present results support the assumption that stereotyping is not necessarily a linear function of categorization (e.g., Lepore & Brown, 1997; Sherman, Macrae, & Bodenhausen, 2000; Wolsko et al., 2000). That is, categorization in terms of a particular category does not necessarily imply stereotypic reactions towards the target. Rather, stereotyping additionally depends on – among other factors – perceivers' stereotypic associations with respect to an activated category. Furthermore, our data underline the importance of regarding categorization and individuation as not necessarily complementary processes (Bodenhausen et al., 1999; Brewer & Harasty-Feinstein, 1999). Both of these processes can occur independently, without decreasing each other's impact. In the present study, both "strongs" and "weaks" used gender to organize the information in memory. However, even though "weaks" did not exhibit reduced categorization, they more thoroughly

attended to individuating characteristics of the targets.

At first glance, our results seem to contradict Fazio and Dunton's (1997) finding that categorization by race varies as a function of perceivers' evaluative associations concerning African Americans. In particular, Fazio and Dunton found that the degree to which individuals use skin color to judge the similarity between targets increases as a function of the strength of perceivers' positive or negative associations. However, there are important conceptual and methodological differences between Fazio and Dunton's study and the present experiments that may be responsible for the differing results. First of all, Fazio and Dunton focused on affective associations, whereas the studies reported here focused on stereotype content, including evaluatively neutral associations. Hence, whereas categorization might be relatively independent of the strength of evaluatively neutral, content-related associations (as observed in our experiments), it could of course be affected by automatic attitude activation (as obtained by Fazio and Dunton, 1997). Second, whereas Fazio and Dunton used similarity judgments and multidimensional scaling to assess individual differences in categorization (see Nosofsky, 1992), the present data are based on memory performance in a recognition task (Klauer & Wegener, 1998). Hence, differences between the present results and Fazio and Dunton's (1997) data could also reflect methodological differences such as differential susceptibility to voluntary control. Future research using different social categorization measures to compare the impact of different associative dimensions (i.e., affective versus content-related) might help to further clarify the particular role of associative strength in social categorization.

Associative Strength versus Explicit Beliefs

The main goal of the present experiments was to test the moderating effects of associative strength. An important question for future research, however, is whether

impression formation is only affected by associative strength which can be assumed to elude explicit self-reports (Greenwald & Banaji, 1995), or if similar results can also be obtained for self-reported stereotype endorsement. Stewart, Vassar, Sanchez, and David (2000), for example, presented evidence that perceivers' explicit attitudes toward women's societal roles moderate the individuation of male and female targets. Whereas participants with traditional opinions showed greater individuation for male than for female targets, participants with progressive opinions individuated female targets more than male targets. Hence, moderating effects concerning category-based and individuating impression formation are not limited to associative strength but can also be obtained for explicit beliefs.

Even though Stewart et al.'s results do not match the pattern obtained here, a convergence in the moderation of category-based and individuating impression formation seems trivial as long as explicit and implicit measures are highly correlated. However, most studies report only moderate (e.g., Banse, Seise, & Zerbes, 2001; Wittenbrink et al., 1997) or even low correlations (e.g., Fazio et al., 1995; Greenwald et al., 1998; Karpinski & Hilton, 2001). Hence, stereotypic associations and explicit stereotypic beliefs might affect different aspects of the impression formation process. One possibility is that explicit measures – due to their relations to the motivation to control prejudiced reactions (see Dunton & Fazio, 1997; Plant & Devine, 1998) – predict motivated individuation, whereas implicit measures predict individuation as a function of informational variables such as fit or diagnostic value.

A fruitful parallel may also be drawn to Fazio's MODE model of attitude-behavior processes (Fazio, 1990) in which associative strength is contrasted with more explicit, deliberate beliefs. Drawing on the MODE model, it can be expected that associative strength governs spontaneous processes, whereas motivation and opportunity to deliberately control prejudiced reactions should moderate the expression of stereotypes for those who have strong stereotypic associations (e.g., Dunton & Fazio, 1997). In line with this reasoning, associative

strength might be a good predictor for spontaneous processes in impression formation such as context effects of category information on the interpretation of ambiguous behavioral cues (e.g., Gawronski, Geschke, & Banse, 2001), whereas explicitly assessed beliefs should be better in predicting processes of deliberate dispositional inference. Yet another possibility is that stereotypic associations moderate individuation at encoding, whereas explicit stereotypic beliefs affect deliberate attributional processes of individuation (see Sherman, Stroessner, & Azam, 2001). Future research contrasting the impact of stereotypic associations and explicit stereotypic beliefs might help to further understand the interplay of explicit and implicit determinants of category-based and individuating impression formation.

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Footnotes

1 Since the IAT was administered after the impression formation task rather than before, one might object that the present manipulations of category and individuating information could have affected IAT-scores (e.g., Blair, Ma, & Lenton, 2001; Dasgupta & Greenwald, 2001), thus undermining an interpretation in terms of the present hypotheses. However, submitting IAT-scores to an analysis of variance revealed no significant main or interaction effect for any of the factors manipulated in Experiments 1a and 1b. Hence, there is no evidence that IAT-scores were systematically affected by our experimental manipulations.

2 The interplay of these processes and how they are implemented in the model structure to account for the empirical assignment frequencies is discussed in more detail by Klauer and Wegener (1998). They also explain why the different model parameters can be considered as mutually independent and process-pure measures of the respective underlying processes.

3 This process is captured regardless of the statement's original stereotypicality, which is defined by its relation to the speaker's category and can by definition not be retrieved when category guessing comes into play (or is not even defined, as in the case of distracters). In the present investigation, the category guessing parameter a captures the probability that a given statement is assigned to a woman, and there is one such parameter for progressive statements (consistent assignment) and one for conservative statements (inconsistent assignment). The probability to assign a given statement to a man is accordingly given by the respective complementary probability (1-a).

4 Note that a statement's stereotype-consistency is only defined in relation to the category membership of its speaker. For example, one and the same conservative statement is consistent if made by a man, but inconsistent if made by a woman. Therefore the mere ability to recognize a statement as encountered before (and possibly so in the absence of category or person memory) is not necessarily affected by its initial stereotypicality. Similarly, although a

case could be made for “strongs” to have better item discrimination overall (or, alternatively, worse item discrimination overall), we did not find such effects.

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Table 1

Parameter Estimates and 90%-Confidence Intervals in the Multinomial Model on the "Who-Said-What?"-Task, Experiment 2

Parameter	Associative Strength	Stereotype Consistency	Estimate	Confidence Interval
Item Memory	=	=	.86	.85 - .87
Item Guessing (old)	=	=	.17	.14 - .20
Person Memory	strong	inconsistent	.40	.36 - .45
		consistent	.39	.35 - .44
	weak	inconsistent	.45	.41 - .49
		consistent	.46	.41 - .50
Person Guessing (1/n)	=	=	.25	(constant)
Category Memory	strong	inconsistent	.79	.73 - .85
		consistent	.48	.24 - .72
	weak	inconsistent	.75	.64 - .85
		consistent	.80	.69 - .92
Category Guessing	strong	inconsistent	.21	.11 - .31
		consistent	.65	.52 - .78
	weak	inconsistent	.45	.27 - .63
		consistent	.57	.39 - .74

Note. Goodness of model fit: $\chi^2(18) = 16.87$, $p = .53$. Equality signs indicate that parameters have been set equal across conditions. Stereotype consistency refers to the original consistency of a statement with a speaker's category in the discussion for person memory and category memory, and it refers to the consistency of assignments for category guessing.

Figure Captions

Figure 1. Mean ratings of communal versus agentic orientation as a function of the target's gender (woman vs. man), individuating information (work responsibilities vs. domestic responsibilities), and strength of gender-stereotypic associations (weak vs. strong), Experiments 1a and 1b. Higher values indicate higher ratings of communal orientation and lower ratings of agentic orientation.


Weak Associations
Strong Associations
4
3,5
3
2,5
2
Communal Orientation
Woman
Man
Woman
Man
Domestic Responsibilities
Work Responsibilities

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