On the bounded rationality of gender stereotyping in fame judgments

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Abstract

The false-fame effect is the phenomenon that familiar names are falsely judged famous more often than unfamiliar names. M.R. Banaji and A.G. Greenwald (1995) demonstrated a gender bias in the false-fame effect: In line with existing gender stereotypes, the false-fame effect was larger for male than for female names. A more general explanation for gender biasing in fame judgments is based on cognitive availability. Name gender could be used as an ecologically valid cue when making fame judgments. If the relevant universe of famous names contained more male than female names, a gender bias in fame judgments should be observed, if it contained more female names, the gender bias should be reversed. Indeed, this pattern could be demonstrated experimentally, and we argue that it is not compatible with an account that draws on gender stereotyping but with one based on cognitive availability. Copyright © 2004 John Wiley & Sons, Ltd.

The pervasiveness of stereotyping is an intriguing question. It is all the more intriguing to the extent to which stereotyping seems to occur even in the absence of conscious knowledge and in the presence of deliberate attempts to the contrary. Accordingly, since pioneering studies (Gaertner & McLaughlin, 1983), the emphasis in research on stereotyping has shifted towards their automatic, uncontrollable, or implicit components (e.g. Banaji & Hardin, 1996; Blair & Banaji, 1996; Devine, 1989; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Fazio, Jackson, Dunton, & Williams, 1995; Lepore & Brown, 1997; Rudman, Greenwald, & McGhee, 2001; Wittenbrink, Judd, & Park, 1997). Banaji and Greenwald (1995) developed a unique procedure for measuring implicit gender stereotyping. Their findings have interesting implications for both research on stereotyping and research on memory and thus have appropriately generated a lot of interest. Banaji and Greenwald investigated the so-called false-fame effect that was originally discovered in the data of Neely and Payne (1983) and was later extended into a research paradigm of its own by Jacoby et al. (Dywan & Jacoby, 1990; Jacoby, Kelley,

Brown, & Jasechko, 1989; Jacoby, Woloshyn, & Kelley, 1989; Jennings & Jacoby, 1993). A false-fame effect is demonstrated if familiarized names of nonfamous persons are judged *famous* with a higher probability than the same names when they were not previously familiarized. Apparently, in the absence of explicit knowledge about the fact that the names' familiarity results from the study phase, familiarity is misattributed to their being the names of famous persons (Steffens, Buchner, Martensen, & Erdfelder, 2000).

According to Banaji and Greenwald (1995), due to the fact that there are more famous males than females in society, the gender stereotype implies a closer association between 'male' and 'famous' than between 'female' and 'famous.' This, in turn, results in a gender bias in the process of attributing fame: a lower criterion is used when male as opposed to female names are judged. Banaji and Greenwald demonstrated empirically that familiarized nonfamous *male* names were falsely judged famous more often than familiarized nonfamous *female* names, whereas there was no such difference for nonfamiliarized names. That is, the Banaji effect took the form of an interaction between name gender and name familiarity on false alarms (i.e. on nonfamous names judged famous).[1]

The gender bias in fame judgments was interpreted as an instance of implicit gender stereotyping. As we posit, a stereotyping account of the gender bias implies that it does not simply mirror the proportion of famous males and females in the to-be-judged 'universe' in a given context, but rather reflects a more durable association or willingness to call males rather than females famous. That is, the male-famous association should also be found when the proportion of famous males is not higher than the proportion of famous females. Conversely, if a gender bias favouring females instead of males was easily obtained when the proportion of famous females exceeded that of famous males, then the effect would hardly qualify as stereotyping but better be framed as an instance of cognitive availability. The respective mechanism would be adjusting the criterion for judging fame such that the proportion of females judged famous mirrors the proportion of females in the relevant universe of famous people. Such a mechanism would fit the large body of literature on the availability heuristic, showing that probability judgments depend on the availability of the respective instances. The more *easily* famous females come to mind (see Schwarz & Vaughn, 2002, for distinguishing this rule from: 'the *more* famous females come to mind'), the more liberal will be the criterion for judging females famous. In their seminal paper, Tversky and Kahneman (1973) demonstrated that the proportion of names of females in a previously presented list was estimated to be higher if these females had been more famous, and were thus more easily remembered, than the male names in the list. They described availability as an 'ecologically valid clue for the judgment of frequency because, in general, frequent events are easier to recall or imagine than infrequent ones' (Tversky & Kahneman, 1973, p. 209).

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[1]In addition to this direct analysis, Banaji and Greenwald performed indirect analyses, using a signal detection measurement model. They found lower values of the criterion (log β) when judging the fame of familiar male names, in comparison to the three other categories of names (unfamiliar male, familiar female, and unfamiliar female).

There is an important, substantive reason for assigning more weight to the false-alarm results than to the log-β results. The gender bias hypothesis directly implies more false alarms for male than for female familiar names. Therefore, it is more adequate to base the statistical evaluation of the gender bias hypothesis on the false-alarm data directly. Moreover, methodologically, a low value of the criterion measure may simply result from an increase in the number of hits, everything else being equal. Referring to this as a liberal criterion is obviously problematic. Finally, whereas log β is probably the most frequently used criterion in signal detection models, it is generally not recommended for the analysis of memory-related data (Lockhart & Murdock, 1970; Macmillan & Creelman, 1991; Snodgrass & Corwin, 1988). One argument against its use is that the psychological process of assessing log β, that is, assessing the ratio of the heights of the old and new distributions, in a recognition memory test prior to responding *yes* or *no* to a given stimulus seems very unlikely. 'Locating the relevant new distribution would appear to require prior perfect knowledge of whether the item is old or new, the very decision we are asking the subject to make' (Snodgrass & Corwin, 1988, p. 37). A second argument is that log β is not independent of the discrimination score or sensitivity measure, d' (cf. Macmillan & Creelman, 1991), because it is the slope of the receiver operating characteristic curve (ROC). Therefore, given differences in d', differences in log β cannot be interpreted unambiguously. Another criterion, the distance from the intersection of the old and new distributions, C, is recommended instead of log β (Macmillan & Creelman, 1991; Snodgrass & Corwin, 1988).

EMPIRICAL INVESTIGATION

We conducted the present experiment in order to test between a gender stereotyping and a cognitive availability account of the gender bias in fame judgments. We assumed that participants (not necessarily consciously and purposefully) match their fame judgments with their knowledge of the relative proportions of male versus female persons in the 'fame universe.' Consequently, if more males are available in the fame universe, they should judge more familiar male than female names famous. In contrast, they should judge more familiar female than male names famous if more females were available in the fame universe. Normally, participants' knowledge of famous males and females in general leads to the cognitive availability of more famous males. In the present experiment, we manipulated the proportion of male versus female names in a to-be-learned list of names. Either one quarter (More-Famous-Males Condition) or three quarters (More-Famous-Females Condition) of the names in that list were female names. After participants had learned such a list of names (henceforth referred to as the fame list), we applied the typical false-fame procedure, a study phase in which the pronouncableness of names was judged, and a test phase in which fame judgments were made. The instructions stressed that all famous names in the test phase were from the fame list. In the pronunciation phase as well as in the test phase, participants both in the More-Famous-Males and in the More-Famous-Females Condition received identical lists composed of 50% male and 50% female names, and 50% names from the fame list as well as 50% nonfamous names. We expected an interaction of experimental condition and name gender on false alarms. Specifically, we hypothesized that participants in the More-Famous-Males Condition would falsely assign fame to male names more often than to female names, whereas participants in the More-Famous-Females Condition would show the reverse pattern.

METHOD

Participants

The participants who took part in all three phases of the experiment were 70 psychology students at the Universität Trier. They received course credit for participating. Participants whose mean discrimination between famous and nonfamous names was not above 0 ($n = 2$) were excluded from analyses. Of the remaining participants, an additional four with low discrimination scores were excluded in order to obtain an equal number of participants in the More-Famous-Males ($n = 32$) and in the More-Famous-Females Condition ($n = 32$) who received identical name sets (see Materials).

Materials

The experiment was carried out in January 2002, that is, just before the Olympic Games in Salt Lake City, USA. All names used in the experiment were selected from the lists of participating athletes on the official web pages and thus were somewhat famous. Criteria for the selection of names were: (1) German participants should be able to tell the sex of the athlete by the name (which excluded almost all Asian names); (2) the name should consist of exactly one first and one last name; (3) each first and last name should only occur once in the list; (4) the athlete should be unknown to most participants, therefore, German athletes and previous gold medal winners were generally excluded. A pilot study ($n = 4$) was conducted in which people interested in watching winter sports indicated which athletes were known to them. Each of the names selected by at least one of the judges was replaced.

The names that were familiarized for one participant were new for another, and vice versa. In addition, the names that were famous for one participant were nonfamous for another, and vice versa. For instance, for one participant Scott Niedermayer and Casey Puckett would be on the fame list, that is, these would be names learned prior to the experiment. Scott Niedermayer would appear on the pronunciation phase list for that participant and thus be familiarized, whereas Casey Puckett would not. For the second participant, it would be reversed which of the two names was familiarized. For both participants, Tomas Johansson and Yelena Berezhnaya would be names encountered only later in the experiment, thus, nonfamous names, one of them familiarized, the other, not. For the next two participants, names were exchanged: Tomas Johansson would be famous and familiarized for one participant, but famous and not familiarized for the next, and vice versa with Yelena Berezhnaya. Thus, there were 2×2 sets of critical names, and each of them contained 10 male and 10 female names. These sets were matched for nationality and sports discipline. Each name on the fame list was accompanied by information about the athlete's nation and sports discipline in order to make the task of learning the names more meaningful.

In addition to the critical names, filler names were needed to manipulate the proportion of male and female names in the fame list. These were 55 male and five female names in the More-Famous-Males Condition, and vice versa in the More-Famous-Females Condition. Thus, there were either 25% or 75% female names on the fame list. These proportions may seem very high. However, we conducted a pilot study ($n = 8$) with 67% female or male names in the fame list. All pilot study participants indicated that they had studied that fame list for more than 1 h. Still, the majority of them had not noticed that there were unequal numbers of names of both sexes in the list. Therefore, we manipulated the proportions of male and female names in a stronger manner in the experiment proper. In order to check whether the fame list had been learned well enough, a recognition test list was composed. That list consisted of 25 of the filler names and 25 new names (in each name category, five male and 20 female names for the More-Famous-Females Condition, five female and 20 male for the More-Famous-Males Condition). The recognition test names that were old for one participant were new for another, and vice versa.

We thus arrived at four fame lists of 100 names each (Fame Set A, more male filler names, Fame Set A, more female filler names, Fame Set B, more male filler names, and Fame Set B, more female filler names). There were also four recognition test lists of 50 names each (Recognition Test Set $\times$ Condition). There were two pronunciation phase lists of 40 names, each containing half of the critical names. Note that a pronunciation phase name that would be famous for one participant would be nonfamous for the next, and vice versa. Finally, there was one test list of 80 names. A name on that list would be famous and familiarized for one participant, famous and nonfamiliarized for the next, nonfamous and familiarized for a third, and nonfamous and nonfamiliarized for a fourth. As is implied in the above description, the total number of names of olympionics used in the experiment was 230.

Procedure

Participants were asked for strict confidentiality. They were handed a fame list at the end of a lecture and asked to learn the names, but not nationalities or sports disciplines, well enough so they would be able to recognize 80% of the names among similar names a week later. The instructions recommended that they rather study the names in small packages, not the whole list at once, as well as distribute practice over several occasions, which, in total, should not exceed 1 h.

The following week, participants returned their fame lists, and according to the set and condition indicated on the top of that list, they were handed appropriate recognition test and pronunciation phase sheets. They filled in both in a large lecture room before a lecture.

Two days later, they were handed the test list and asked to indicate which names on the list belonged to famous people, that is, which had been on the list they had learned a week before, and they indicated whether their fame list had contained more female names, more male names, or an equal proportion of both. A few weeks later, during the lecture in which they were recruited, all participants were debriefed and informed about the purpose and results of the experiment.

Design

The dependent variables were the fame judgments in response to 'famous' names and to 'nonfamous' names. Independent variables were name gender and name familiarity (both manipulated within-subject). In addition, there were two experimental conditions (More-Famous-Males vs. More-Famous-Females), thus, a $2 \times 2 \times 2$ design resulted. We also varied Fame Set (A vs. B), Recognition Set (A vs. B), and Pronunciation Set (A vs. B).

RESULTS

The Type-I-error probability α was set at 0.05 in all experiments presented. Therefore, individual p-values are omitted for statistically significant effects. As a measure of effect size, R_{p}^2 is reported (Cohen, 1977): The proportion of variance explained by a given factor, relative to the variance not explained by any other factor. Hit rates (*famous*-responses to 'famous' names) and false-alarm rates (*famous*-responses to 'nonfamous' names) were computed for familiar male, familiar female, unfamiliar male, and unfamiliar female names.[2] We also report sensitivity (d') and response bias measures. As elucidated in footnote 1, C was used instead of log β (cf. Macmillan & Creelman, 1991; Snodgrass & Corwin, 1988).

The top panel of Figure 1 shows that hit rates were slightly higher for female as opposed to male names, and they were higher for familiar as opposed to unfamiliar names. This was the case in the More-Famous-Males as well as the More-Famous-Females Condition. The second panel of Figure 1 shows that there was an overall false-fame effect in both conditions, too. In contrast, the pattern of false-alarm rates seems to vary by condition, with more nonfamous male names called famous in the More-Famous-Males Condition and more nonfamous female names called famous in the More-Famous-Females Condition. The third panel shows that discrimination between famous and non-famous names seems lower for the name gender of which there had been more names in the fame list. More lenient criteria were applied when judging familiarized as opposed to nonfamiliarized names, as the lower panel of Figure 1 shows. More importantly, participants were biased toward calling famous the names of the gender that had been over-represented in their fame list.

Hits

A $2 \times 2 \times 2$ repeated measures ANOVA performed on the hit rates confirmed the visible main effects of name gender, $F(1, 62) = 4.86$, $R_{\mathrm{p}}^2 = 0.07$, and name familiarity, $F(1, 62) = 47.44$, $R_{\mathrm{p}}^2 = 0.43$. There were no other main effects or interactions, all Fs < 1.

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[2]As a correction for empty cells, 0.5 was added to the number of hits or false alarms, and the result was divided by $(n + 1)$ (Snodgrass & Corwin, 1988).
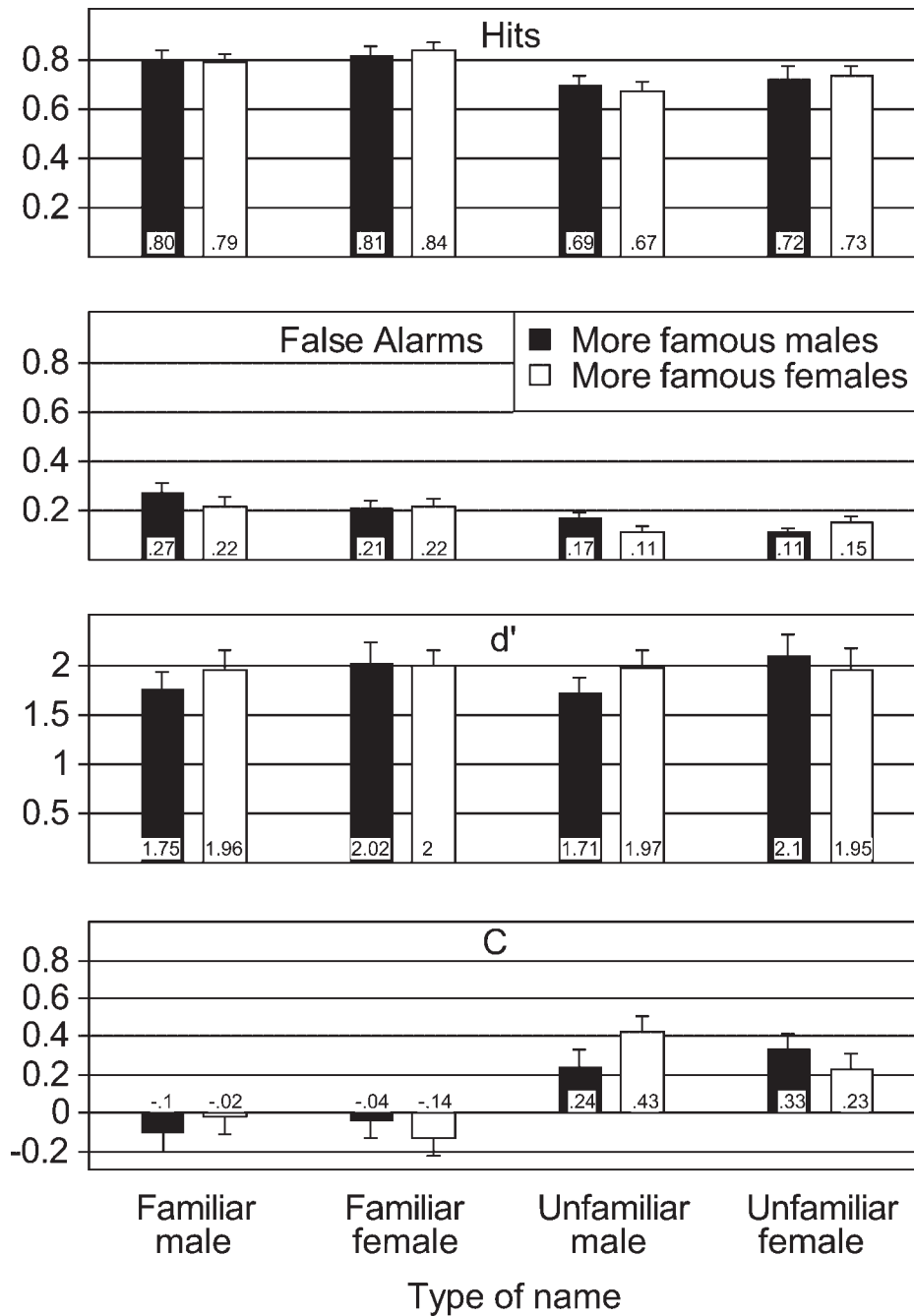
Figure 1.   Hits, false alarms, discrimination d' and bias C, separately for the More-Famous-Males and the More-Famous-Females Condition (means and standard errors of means), separately for the four kinds of stimuli: familiarized male and female names and unfamiliar male and female names

Eur. J. Soc. Psychol. **34**, 397–406 (2004)

False Alarms

The same analysis on the false alarms showed the false-fame effect, $F(1, 62) = 48.36$, $R_p^2 = 0.44$, and the expected interaction of name gender and experimental condition, $F(1, 62) = 10.48$, $R_p^2 = 0.15$. As separate ANOVAs for each experimental condition showed, fame was falsely assigned more often to female than to male names in the More-Famous-Females Condition, $F(1, 31) = 4.76$, $R_p^2 = 0.13$, and fame was falsely assigned to male names more often than to female names in the More-Famous-Males Condition, $F(1, 31) = 6.21$, $R_p^2 = 0.17$.

Sensitivity Measure

The same analysis on d' showed a main effect of name gender, $F(1, 62) = 5.95$, $R_p^2 = 0.09$, and an interaction of name gender and experimental condition, $F(1, 62) = 5.30$, $R_p^2 = 0.08$, all other Fs < 1. Separate ANOVAs for the experimental conditions showed that sensitivity was reduced for male as opposed to female names in the More-Famous-Males Condition, $F(1, 31) = 8.49$, $R_p^2 = 0.22$, but there was no effect of name gender in the More-Famous-Females Condition, $F < 1$.

Criterion Measure

A $2 \times 2 \times 2$ repeated measures ANOVA on C showed a main effect of name familiarity, $F(1, 62) = 92.43$, $R_p^2 = 0.60$, and an interaction of name gender and experimental condition, $F(1, 62) = 8.29$, $R_p^2 = 0.12$, all other Fs ≤ 1.15. Separate ANOVAs for the experimental conditions showed that there was no statistically significant effect of name gender in the More-Famous-Males Condition, $F = 1.16$, but a more lenient criterion was applied when judging the fame of female as opposed to male names in the More-Famous-Females Condition, $F(1, 31) = 13.18$, $R_p^2 = 0.30$.

DISCUSSION

The present research extends Banaji and Greenwald's (1995) finding that the false-fame effect was larger for male as opposed to female names. Our main result is that the direction of the gender bias depends on the number of famous male and female names in the relevant fame universe. There were 75% famous males in the fame list of the More-Famous-Males Condition and 75% famous females in the fame list of the More-Famous-Females Condition. These lists were learned prior to the two phases of a typical false-fame experiment. Those two typical phases, in turn, were absolutely identical in both experimental conditions. Still, fame judgments varied by condition. Given identical names, the false-alarm rate was higher for male as opposed to female names for those participants who had learned a fame list consisting of 75% male names. Thus, they showed a typical gender bias favouring males. In contrast, the false-alarm rate was higher for female as opposed to male names for those participants who had learned a fame list consisting of 75% female names—a reversed gender bias resulted.

   The most parsimonious explanation for our findings is the cognitive-availability hypothesis. If, given one's knowledge of the total relevant universe of famous names, the a priori likelihood is high that the presented name is indeed famous, that name is judged *famous*. The social group to which the name belongs is used as an ecologically valid cue for its likelihood of being famous (cf. Gigerenzer & Goldstein, 1999). In so far, using the information conveyed by the 'gender' category constitutes an instance of bounded rationality. Consequently, a gender bias emerges if the a priori likelihood for a

male name being famous is considered higher than that of a female name. In contrast, if the likelihood for a female name being famous is higher, the result is a reversed gender bias. Matching response behaviour to the fame of study phase names was also observed in another experiment (Buchner, Steffens, & Berry, 2000, Experiment 2): Very famous men but no very famous women were presented. Consequently, fame was more readily assigned to male as opposed to female names from the study phase, resulting in a gender bias. Such matching response behaviour shows that the base rates of famous males and females in a given context are taken into account in the judgment process. The objective proportions of males and females are considered, and heuristic judgments are not based on constant individually constructed estimates of the numbers of famous males and females in society.

The data pattern we observed on the false alarms was not identical to that of Banaji and Greenwald (1995). Their experiments showed a gender bias only for familiarized nonfamous names. In the present experiment we observed a gender bias (or a reversed gender bias) for familiarized as well as nonfamiliarized nonfamous names. This replicates the pattern of data reported by Buchner et al. (2000), and we also observed it in other experiments (Buchner & Wippich, 1996; Steffens et al., 1999). This data pattern could be an effect of materials. All the names in the present experiment could in fact be conceived as names of famous people. They were selected to be barely famous, but it could still be that participants had come across these names before. As an anecdote, all of us involved in the selection of names and all the participants in the pilot study, after having learned the names, were surprised how often we heard these names, in passing, on the radio or on TV. Before studying the names, we were sure that we had never been exposed to them. Thus, it could well be that some 'unconscious foundation' had been built by prior exposures, so that these names were, even if not familiarized during the experiment, familiar to some extent. Consequently, given sufficient familiarity of all names, a cognitive-availability strategy was applied to the nonfamiliarized names as well as to the familiarized ones, and a gender bias appeared for both kinds of nonfamous names. Note that Banaji and Greenwald (1994) did not predict a stronger gender bias for familiar than unfamiliar names. Instead, they only described post hoc that 'the stereotype apparently operates with greatest force for nonfamous names that are given a boost in familiarity by presentation on Day 1' (p. 63). Why this should be so is not quite clear. If the two preconditions for a lowered criterion in judging fame are name familiarity and maleness, then all male names that seem familiar enough should be judged famous. The substantial number of false alarms on nonfamiliarized names that is generally observed in false-fame experiments makes it obvious that some of them did indeed seem familiar enough. Therefore, a gender bias in fame judgments should be apparent for familiar and nonfamiliar names. In line with this reasoning, in our experiment, the stereotype operated with equal force for all 'nonfamous' names of the gender that was over-represented in the fame universe, given an extra boost of familiarity or not. Another reason for the different patterns of gender biases observed may be that the consequences of criterion shifts on hypothetical fame distributions depend on where the criterion is set (cf. Buchner et al., 2000, for details).

Our main finding is that the gender bias in fame judgments favoured male names in one condition and female names in the other. Banaji (e.g. Banaji & Greenwald, 1994) has argued that even if it is correct that differences in male and female fame exist, the application of such a difference in probabilities to judgments of individual male and female names constitutes an act of stereotyping. Similarly, even if there are more convicted criminals who are black than white, judging unknown individuals as criminals on the basis of a name that appears to belong to a black person constitutes an act of stereotyping (cf. also Banaji & Bhaskar, 2000; Park & Banaji, 2000). We agree. Still, we think that the present experiment questions the centrality of such instances of stereotyping. In the More-Famous-Females Condition, a counterstereotype—a closer female-famous association—was quite easily induced and subsequently applied to judgments of individual nonfamous females and males. Similarly, in another study we found a reversed gender bias if the famous females presented during

study were drastically more famous than the famous males (M. C. Steffens, A. Buchner, & S. Mecklenbräuker submitted; gender bias in fame judgments: implicit gender stereotyping or matching study phase fame?). If a stereotype can be reversed with such apparent ease, it is obviously quite limited in its power and pervasiveness. Therefore, we prefer to regard this stereotyping process as the quite accurate use of an ecologically valid cue, providing an instance of people's bounded rationality instead of the unjust application of social category knowledge to the perpetuation of group differences.

Automatic stereotyping in general, and the gender bias in particular, have drawn much attention within the field of social cognition as well as beyond. One reason for this is that stereotyping processes that are beyond individual conscious control place the perpetrator in the position of the victim of her or his cognitive system. Moreover, being beyond control, such stereotyping processes cannot be corrected by changing consciously held beliefs. In line with that, Banaji and Greenwald (1995) showed that the gender bias was not moderated by explicitly held gender stereotypes, and it was not moderated by sensitizing participants to the gender variable. In contrast, our experiment has demonstrated that gender stereotyping in fame judgments is not inevitable. We showed that changing the relative availability of men and women in the fame universe reversed the observed gender bias. Such a strategy of challenging beliefs about social groups could be readily applied in other settings in which gender stereotyping should be avoided. Our findings make it rather obvious that implicit gender stereotyping, at least with respect to fame judgments, can be overcome quite easily and may thus be less relevant for injustice and discrimination in society than it seemed. As our findings imply, the less ecologically valid male gender becomes as a cue for judging a person's fame, the less important gender will become as a cue in fame judgments.

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