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Schmid Mast, Marianne; Hall, Judith A.

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2 authors, including:

Marianne Schmid Mast

University of Lausanne

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Women's Advantage at Remembering Others' Appearance: A Systematic Look at the Why and When of a Gender Difference

Marianne Schmid Mast
Judith A. Hall
Northeastern University

Women recall the appearance of others better than men. The goal of the present research was to shed light on the explanations and boundary conditions of this gender difference. In three studies (592 participants), the authors tested potential mediators and moderators of the gender difference. Results corroborated the robustness of the gender difference. General task motivation, general memory ability, importance of appearance, appearance knowledge, attention paid to target, gazing at target, and communal or agentic orientation could not explain why women were better at recalling others' appearance than men were. Except for importance of appearance and appearance knowledge, which both decreased the magnitude of the gender difference, general task motivation, attention paid to target, length of exposure to target, delay in responding, cognitive load, and response format (verbal vs. nonverbal) had no effect on the gender difference. Results are discussed in relation to gender differences found in the nonverbal sensitivity literature.

Keywords: gender; appearance; recall; interpersonal sensitivity

When it comes to knowing other people, the nonverbal communication literature shows that women are more interpersonally sensitive than men. For instance, women are more accurate at judging other people with respect to personality characteristics, (e.g., Ambady, Hallahan, & Rosenthal, 1995; Vogt & Colvin, 2003), affect (e.g., Biehl et al., 1997; Hall, 1978, 1984; Hall & Matsumoto, 2004; McClure, 2000; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979), and social relations (e.g., Costanzo & Archer, 1989). Despite much speculation on explanations for this difference (Andersen, 1998; Hall, 1984; Hall, Carter, & Horgan, 2001; Henley, 1977; Ickes, Gesn, & Graham, 2000), research on causes, whether proximal or distal, has been surprisingly unsystematic. It is fair to say that very little is known about what

produces this gender difference, and most speculation has centered on distal influences such as gender roles and social status (Hall & Halberstadt, 1994; Hall, Halberstadt, & O'Brien, 1997; Henley, 1977). More proximal causes such as interest or motivation, as well as moderators, have received very little attention.

Recently, Horgan, Schmid Mast, Hall, and Carter (2004) showed that women also have better memory for the appearance of others than men do. Across five studies that included live interactions and videotaped stimuli, forewarned and unforewarned recall tasks, and recognition recall and free recall tasks, women were more accurate than men at remembering details such as clothing, hair, accessories, and physiognomy, with an effect size (point-biserial correlation) of .24 between gender and accuracy, corresponding to a Cohen's *d* of .49. The magnitude of this effect is similar to that found for the kinds of sensitivity named earlier. For example, Hall's (1978, 1984; Hall, Carter, & Horgan, 2000) reviews of

gender differences in accuracy of decoding nonverbal cues show an average point-biserial correlation of about .20, corresponding to a Cohen's *d* of .40.

The present series of systematic investigations were aimed at testing how robust the gender difference in appearance recall is by investigating an array of variables in terms of their potential role as mediators or moderators. By asking about mediators—that is, variables that might account for the difference—we asked whether some variables could explain why women do a better job at recalling the appearance of others than men do. Is it for instance because they are more motivated to recall others' appearance, are more interested in appearance, have more knowledge about appearance, are more focused on all interpersonal information (one kind of which is information about appearance), or because they are simply trying harder on all the experimental tasks? By asking about moderators—that is, the boundary conditions around the difference—we asked whether certain circumstances are associated with a smaller or larger difference. Are there conditions under which the female advantage in memory for the appearance of others disappears? In other words, when do we find the gender difference in appearance recall? For instance, does women's advantage decrease when participants are under a cognitive load or when their attention is focused on the room they are in rather than on their interaction partner?

Thus, the present studies aimed at testing potential explanations and limits of women's advantage in recalling others' appearance. The variables we looked at as potential mediators or moderators were either individual differences measures or experimentally manipulated variables that we thought might bear on this gender difference, some of which have been suggested as influencing factors in the literature (e.g., Horgan et al., 2004).

STUDY 1

In Study 1, we tested whether general task motivation, specific task motivation (importance of appearance), and specific task knowledge (appearance knowledge) could account for women's advantage in recalling others' appearance. We also treated the same variables as potential moderators to see if the magnitude of the gender difference changed when participants were relatively low versus high on these variables.

Task motivation affects performance. So to the extent that women may be more motivated to comply with experimenter instructions and put effort into psychological experiments, this could explain performance differences on appearance recall. There is evidence from the literature that such gender effects in compliance to experimenter instructions may exist (e.g., Bushman,

1984; Eagly, 1978; Weiss, 1969). In Study 1, we therefore measured general task motivation with a task unrelated to appearance.

Even if we confirm that general task motivation does not explain the gender difference in appearance recall, there still might be specific task motivation at work. By specific task motivation, we mean that to the extent that appearance is more important to women than to men, women might be motivated to do a particularly good job at remembering the appearance of others. Indeed, women show a greater interest in clothing than men (Kwon, 1997). And for women, their physical appearance is more important than for men (Jackson, Sullivan, & Hymes, 1987; Pliner, Chaiken, & Flett, 1990).

Because appearance is more important to women, they might know more about appearance and hence have more complex mental representations (more knowledge) about appearance. Because possessing more knowledge in a certain field facilitates the incorporation of new information pertaining to that same field (e.g., Bransford, Brown, & Cocking, 1999), women might be able to store appearance details much easier in memory than men. Based on this reasoning, we tested whether women have more knowledge about appearance (by assessing the extent of their vocabulary for appearance) and whether possessing more appearance knowledge explained the gender difference in appearance recall.

Method

PARTICIPANTS

Participants were 100 (53 male and 47 female) undergraduates at Northeastern University. They participated for partial course credit. Participants were drawn from the departmental participant pool. Participants were 18.7 years old (range = 18 to 21), and 79% were Caucasian, 8% Hispanic, 6% African American, 6% Asian, and 1% other.

PROCEDURE

Participants were tested in groups of 5 to 10 people. They viewed video clips of people interacting and were asked what they remembered about those people's appearance afterward. After viewing the video clips, participants performed a task measuring general and specific task motivation as well as specific task knowledge (described in more detail in the following).

MEASURES

Appearance recall. We selected a 20-second excerpt from a videotape that we made of five people (targets) who sat in a semicircle in a room (three women and two men). Targets talked about the latest movies. Each target in the scene was numbered 1 to 5. Participants watched

this "five person" clip and subsequently answered 26 multiple-choice appearance questions to which the answer was either yes or no. Sample items are "Was person four wearing brown pants?" or "Were persons two and four blond?" Mean appearance recall of the five-person clip was 14.81 (SD = 4.78, range = 0 to 24, possible range = 0 to 26), and Cronbach's alpha was .61. Appearance recall was better than chance (chance was 50%), $t(99)$ = 3.77, p < .001.

In addition, we selected 10 short (10-second) video clips of 2 people (same and opposite gender dyads, featuring 8 men and 12 women) conversing in a laboratory (from an unrelated study). After each clip, participants were asked six multiple-choice questions to which the answer was either yes or no. Sample items for appearance recall are "Was the person on the right wearing black shoes?" or "Were both wearing tops with zippers?" To obtain appearance recall of the 10 short clips, we summed up the correct answers. Mean appearance recall was 43.46 (SD = 9.29, range = 6 to 59, possible range = 0 to 60) and was better than chance, $t(99)$ = 14.47, p < .001. To calculate reliability, we summed up the correct answers for each of the 10 target dyads. Cronbach's alpha across the 10 target dyads was .79.

Because appearance recall from the five-person clip and appearance recall from the 10 short clips were significantly related, $r(97)$ = .49, p < .0001, we aggregated the two measures to obtain one appearance recall measure. To do so, we standardized both measures and then averaged them.

General task motivation. To measure how willing to comply with instructions and to perform well in the experimental situation participants were, we included a task that measured general task motivation. It was important not to select a task that would favor one gender. We decided to use the "uses for a knife task" (Harkins, 1987) in which participants are asked to generate as many uses for a knife as possible within 5 minutes and to list them on a sheet of paper. We emphasized that we were interested in the number of uses that people can come up with, not in how creative or unusual the uses are and that the uses can be quite ordinary. General task motivation was the number of uses a person listed within the time frame of 5 minutes (M = 13.00, SD = 5.77, range = 2 to 36).

Specific task motivation. We developed a questionnaire measuring individual differences in how important appearance is in one's life and how much attention a person says he or she pays to appearance not only in oneself but also in others. Participants indicated on this importance of appearance questionnaire for 14 items (4 of which are reverse scored) on a scale from 1 (*disagree strongly*) to 6 (*agree strongly*) how much they agreed with a statement. Sample items are "I know that people

sometimes judge me based on what I am wearing or how I look" or "I couldn't care less about my looks" (reverse scored). Cronbach's alpha was .76. Items were averaged, and higher values indicate that appearance is more important (M = 4.48, SD = 0.50, range = 3.29 to 5.64).

Specific task knowledge. We asked participants to write down as many different specific words/expressions as they could come up with for each of the following 10 aspects of appearance: pants, facial hair, hair color, hats, skirts, figure/build, tops, shoes, jewelry, and hairstyle. For each appearance aspect, participants were given a blank sheet of paper with the instruction on top. We summed up the words/expressions within each category and then summed across categories to obtain an overall appearance knowledge measure. Cronbach's alpha across the 10 aspects was .87 (M = 57.45, SD = 24.08, range = 5 to 126).

Results

GENDER DIFFERENCES

We replicated the finding from Horgan et al. (2004) that women recalled more about people's appearance than men did, $t(98)$ = 2.64, p = .01 (women M = 0.23, SD = .06; men M = −0.21, SD = 0.99). The magnitude of this difference corresponded to a point-biserial correlation of .26 (Rosenthal, 1991).

MEDIATION

General task motivation was not responsible for the gender difference in appearance recall because results showed no gender difference in general task motivation, $t(96)$ = 1.63, p = .11. To test whether factors more specific to the domain of appearance can account for the gender difference in appearance recall, we looked at specific task motivation (importance of appearance) and specific task knowledge (appearance knowledge). There was no gender difference in importance of appearance, $t(98)$ = 1.60, p = .12, nor in appearance knowledge, $t(98)$ = 0.26, p = .79.

MODERATION

To test whether general task motivation, importance of appearance, or appearance knowledge moderated the gender difference in appearance recall, we calculated three separate linear regressions, each of which predicted appearance recall simultaneously by gender and each of the moderator variables in turn. The model consisted of gender, the moderator, and their interaction term (interaction was calculated after centering the individual terms) as independent variables. Moderation exists if we find the interaction term to be significant. For general task motivation, appearance recall was not predicted by putting more effort into the uses for a knife task (p > .21), and the interaction was also not significant

(p > .20). For importance of appearance, neither effect was significant (both ps > .32). However, appearance knowledge predicted appearance recall independent of gender (p < .01), such that knowing more appearance words or expressions was positively associated with better appearance recall. Also, the Appearance Knowledge × Gender interaction was significant (p < .003). The standardized beta coefficient of the interaction term was –.29, indicating a negative relationship between increase in appearance knowledge and increase in gender difference. In other words, this result showed that the more appearance knowledge people had, the smaller the gender difference became.

Discussion

This study confirmed the gender difference in accuracy of recalling appearance. General task motivation, importance of appearance, and appearance knowledge did not account for the appearance accuracy gender difference. In terms of moderation, we found that with increased appearance knowledge, the gender difference in appearance recall decreased. This result is discussed later in conjunction with the results from Study 3 in which the same measures were used. It has to be noted that the appearance knowledge measure can be regarded as a "verbal fluency" task or as an indicator of the size of one's vocabulary. If this were the case, it would suggest that the gender difference in appearance accuracy was just another manifestation of the well-documented gender difference in verbal fluency (e.g., Rideout & Winchester, 1990). To test whether the gender difference in appearance recall persists when using a task that is less language bound, we used a nonverbal appearance recall task in Study 3.

STUDY 2

In Study 2, we turned from individual-difference variables in relation to appearance recall of people seen on a videotape to experimentally manipulated variables in relation to appearance recall measured in the context of a live interaction. Specifically, we tested whether focus of attention could account for the appearance recall gender difference, and again we looked at moderator variables.

Because women are more interpersonally oriented (Bakan, 1966; Cross & Madson, 1997; Lippa, 2001), they may pay more attention to their interaction partners than men do, resulting in an advantage for recalling appearance. Women have been shown in many studies to gaze at their interaction partner more than men do (Hall, 1984). We used the following three different operationalizations of focus of attention: (a) We manipulated the focus of attention during interpersonal interaction to or away from the partner, (b) we assessed self-reported attention paid to the partner, and (c) we measured gazing at the partner. Although gazing did not account for the gender difference in appearance recall in two studies reported in Horgan et al. (2004), we included this measure again in the present study.

Method

PARTICIPANTS

Participants were 157 (53 male and 104 female) undergraduates at Northeastern University. In addition, 157 (60 male and 97 female) undergraduates served as interaction partners. Age and ethnicity were not assessed, but participants were drawn from the same departmental participant pool as in Study 1. Participants received partial course credit.

PROCEDURE

Participants interacted in a laboratory room with a partner (76 female dyads, 32 male dyads, 49 opposite gender dyads). The 314 students taking part in this study were randomly assigned to be either participant (n = 157) or partner (n = 157). The dyads interacted during 5 minutes in one of four focus of attention conditions and were videotaped. Both participants and partners were instructed together about the focus of attention condition the dyad was in. In the neutral condition, they were instructed to talk about life on campus. In the focus on partner condition, they were instructed to get acquainted with each other and at the same time to get to know the other as well as possible. In the focus on self condition, they were instructed to get acquainted with each other and at the same time to make a favorable impression on the other. And in the room condition, they were instructed to discuss how to rearrange the room for it to be an office for two people. Each dyad was videotaped during the interaction with their permission. Only the behavior and responses of the participants (not partners) were analyzed.

After the 5-minute interaction, the dyad members were separated. The participant was guided to an adjacent room and the partner remained in the interaction room. Participants first responded to manipulation check questions and then completed a free recall task about the partner's appearance (described in more detail in the following). Partners described their own appearance on a sheet of paper according to the following prompts: hair, shirt or top, pant/skirt or bottom, shoes or footwear, and other physical details.

GAZING

From the videotapes, we coded how long the participant gazed at the partner in seconds (reliability of three trained raters: average r = .97) and found that gazing at the interaction partner was related to how much atten-

tion participants reported having paid to the interaction partner, $r(151) = .21$, $p < .01$.

After the interaction, participants were asked to report how much attention they paid to the partner and how much attention they paid to the room, both on a scale from 1 (*not at all*) to 6 (*very much*). These two measures of self-reported focus of attention to the partner and to the room as well as gazing at the partner served as manipulation checks.

Paying attention to the partner and paying attention to the room were unrelated, $r(154) = .03$, $p > .10$ (also within conditions). Condition significantly affected how much attention people said they paid to the room, $F(3, 152) = 39.11$, $p < .0001$. In the room condition, participants reported paying significantly more attention to the room compared to all other conditions together, contrast $t = 10.74$, $p < .0001$ (*M* room condition = 5.19, *M* neutral condition = 2.46, *M* focus on self condition = 2.45, *M* focus on other condition = 2.77).

Overall, condition did not affect how much attention people reported to have paid to the interaction partner, $F(3, 152) = 1.43$, $p > .10$. However, a focused contrast showed that participants said they paid significantly more attention to the partner in the focus on partner condition compared to all other conditions together, contrast $t = 2.01$, $p < .05$ (*M* focus on partner condition = 5.26, *M* room condition = 4.92, *M* neutral condition = 4.93, *M* focus on self condition = 4.83).

Moreover, results showed that condition significantly affected how much participants gazed at their interaction partner, $F(3, 152) = 56.48$, $p < .0001$. Participants looked at the interaction partner most in the partner ($M = 176.44$) and self conditions ($M = 152.74$), less in the neutral condition ($M = 114.13$), and least in the room condition ($M = 17.08$). Bonferroni post hoc tests revealed that all the pair-wise comparisons were significant (all ps < .02) except for the partner and self conditions.

APPEARANCE RECALL

Comparable to Studies 3 through 5 in Horgan et al. (2004), we asked participants to describe their partner's hair (style, color, length, etc.), the kind of shirt or top the partner wore (type, colors, logos, design, layers, etc.), the kind of pants/skirt or bottom the partner wore (type, color, length, design, etc.), the kind of shoes the partner wore (type, color, design, etc.), and other details about the partner's appearance (makeup, jewelry, etc.). These reports were compared to the partners' self-reported appearance, which was collected according to the same format. If the partner's self description did not provide enough detail or if something was ambiguous, the videotape was consulted. Appearance recall was the total num-

ber of appearance details recalled. Each appearance detail that was not a given was counted. For instance, *short blond hair* was counted as 2 because *short* and *blond* are each an appearance detail whereas *hair* is a given. *Blue sneakers* was counted as 2 because *blue* is an appearance detail and *sneakers* is more specific than just shoe (the category given). Overall appearance recall was $M = 7.43$ ($SD = 3.39$, range = 1 to 18).

Results

GENDER DIFFERENCES

We tested whether there was a gender difference in appearance recall. We calculated a 4 (condition: neutral, self, other, room) × 2 (participant gender) ANOVA with appearance recall as the dependent variable. Results showed a participant gender main effect, $F(1, 146) = 4.02$, $p = .047$, indicating that women recalled more about the appearance of their partners ($M = 7.83$) than men did ($M = 6.64$), thereby replicating the gender difference found in previous studies. The point-biserial correlation between gender and appearance accuracy was $r = .15$. No condition main effect emerged, $F(3, 146) = 1.07$, $p = .36$.[1]

MEDIATION

As a next step, we asked whether the gender difference in appearance recall could be explained by self-reported focus of attention to partner or by gazing. Women reported paying marginally more attention to their partner than men did, $t(154) = 1.71$, $p < .09$ (*M* women = 5.08, *M* men = 4.79), but there was no gender difference in gazing at the partner, $t(150) = 1.10$, $p = .27$ (*M* women = 127.59 seconds, *M* men = 111.15 seconds).

To test whether self-reported paying attention to the partner was a mediator, we calculated a partial correlation between appearance recall and gender (male = 1, female = 2) controlling for self-reported paying attention to partner and compared the result to the zero-order correlation between gender and appearance recall. If the partial correlation is similar to the zero-order correlation, self-reported paying attention to partner does not explain the relationship between appearance recall and gender. This is what we found. The partial correlation was $pr(148) = .14$, $p < .08$, comparable to the zero-order correlation of $r = .15$. Thus, self-reported focus of attention to partner and gazing at partner were not responsible for the gender difference in appearance recall.

MODERATION

In the ANOVA described earlier, there was no significant Participant Gender × Condition interaction effect, $F(3, 146) = 0.15$, $p = .93$. This means that the gender difference in appearance recall was of comparable magni-

tude across experimental conditions, including the room condition in which participants' attention was diverted away from the partner. Thus, women's better appearance recall was the same regardless of which condition they were in, meaning that experimentally manipulated focus of attention was not a moderator. The point-biserial correlations between gender and appearance recall for the different conditions were $r = .24$ for neutral, $r = .17$ for partner, $r = .10$ for self, and $r = .15$ for room.

We also tested whether self-reported focus of attention to partner or gazing at the partner moderated the gender difference in appearance recall. We calculated two separate linear regressions, each with appearance recall as the dependent variable and two predictors (gender and either self-reported focus of attention to partner or gazing at partner). In each case, the interaction of gender and the potential moderator would signify the occurrence of moderation. Neither of the interaction terms was significantly related to appearance recall (both ps > .20). In sum, neither of the variables moderated the gender difference in appearance recall.

Discussion

In this study, we asked participants to remember a partner's appearance after a live interaction, and women were again more accurate than men were. No evidence of a mediating effect of gazing or self-reported attention paid to the partner was found, and there were no moderating effects of those two variables or of the experimentally manipulated focus of attention—neutral, the partner, the self, or the room. Thus, no matter where the conversational focus directed their attention, women were still more accurate at remembering appearance than were men.

STUDY 3

In Study 3, we continued to examine moderators by manipulating several variables while asking participants to remember people's appearance from color slides. Specifically, we asked whether factors intended to affect the difficulty of the recall task would influence the size of the gender difference (cognitive load, duration of exposure to the stimulus, and delay before responding). We also introduced another potentially important moderator, response modality. In all studies to date (five studies in Horgan et al., 2004, and the present Studies 1 and 2), responding was done in verbal form: Participants either wrote down what they remembered in a free recall task, or they answered a multiple-choice task. Study 1 showed that knowledge of appearance words moderated the gender difference such that greater verbal knowledge about appearance was associated with a smaller gender difference, suggesting that the verbal medium may play

an important role in the gender difference. Accordingly, in Study 3 we employed a free recall (verbal) format as in Study 2, but we also included a nonverbal response format that required participants to recognize a person's appearance from a set of five test slides showing the same slide mixed with four other slides of the same person with details of appearance altered. Thus, in the nonverbal format, producing words was not required for achieving accuracy.

To test for the possibility that general memory ability could mediate the gender difference in appearance recall, we administered the digit span test of the Wechsler Adult Intelligence Test (Wechsler, 1955). And, we administered the Bem Sex-Role Inventory (BSRI; Bem, 1974) to test the hypothesis that women's advantage in appearance accuracy is mediated by gender differences in communal or agentic orientation. *Communion* describes an orientation toward others characterized by concern and caring, whereas *agency* describes an orientation toward the self characterized by independence and self-assertion. Women are more likely to possess a communal orientation, whereas men are more likely to possess an agentic orientation (Bakan, 1966; Cross & Madson, 1997; Lippa, 2001). Study 2 showed that the focus on others versus the focus on the self did not explain why or when women have better memory for appearance. However, communion and agency are not only about focus of attention; communion also means a more emotional and interdependent orientation, whereas agency means a more controlling and independent orientation. Women's more pronounced interdependence most likely encompasses all aspects of the other person, including appearance. We included measures of communion and agency in Study 3. Also, we again included the importance of appearance questionnaire and the appearance knowledge measure of Study 1.

Method

PARTICIPANTS

Participants were 335 (159 male and 176 female) students from the participant pool at Northeastern University, as in Studies 1 and 2. Ethnicity data were as follows: 81% White, 6% African American, 5% Asian, 5% Hispanic/Latino, and 3% Other.

APPEARANCE STIMULI

For this study, 16 Northeastern University students (8 men, 8 women) were recruited to be photographed. Each student was photographed several times standing against a neutral wall while photographs were taken. Between photographs, each student changed various elements of appearance (hair, shirt, pants, shoes, or accessories) according to a predetermined schedule.

The first photograph was called the target photograph, and the remaining ones were called changes. The schedule of changes was as follows. In Change 1, they changed one (randomly determined) of the aforementioned elements of appearance; in Change 2, they returned that element to its original state and changed a different element (randomly determined from the remaining elements); in Change 3, they changed the first element to its Change 1 state so that now their appearance incorporated both Changes 1 and 2; and in Change 4, they changed both of these elements back to their original states and changed two other randomly determined elements from those remaining. Students were free to stand as they wished (e.g., position of hands, expression on face), but across different photographs, a given student was instructed to maintain the same pose. Visual inspection established that the students were successful in maintaining essentially identical poses across photographs.

MATERIALS

Photographs were taken with a 35 mm camera and developed into color slides. Administration of the experiment was done using a Kodak carousel slide projector. In the cognitive load condition (see the following), additional slides showing the five-digit numbers that participants were to remember while watching the target slides were loaded into the carousel.

INDEPENDENT VARIABLES

The following four independent variables were randomly assigned between participants, making for 16 experimental conditions: (a) length of exposure to the target slide (4 seconds vs. 8 seconds, referred to as short vs. long), (b) delay before responding (none vs. 8 seconds, referred to as no delay vs. delay), (c) cognitive load (none vs. being required to view a slide containing a random string of five digits for 2 seconds just prior to seeing the target slide and keep it in short-term memory while watching the target slide, referred to as no load vs. load), and (d) response format (writing down details of the target person or room after the slide was removed from view vs. recognizing the target person's appearance from an array of photographs of the same person, referred to as verbal vs. nonverbal). These 16 experimental conditions were randomly ordered by session with all participants within a given session being in the same condition. Three sessions were run for each experimental condition.

RESPONSE FORMAT

Verbal response format. The verbal response format was the same as in Study 2 with the response categories being hair, shirt or top, pants/skirt or bottom, shoes, and other.

Nonverbal response format. The nonverbal response format was based on a recognition memory paradigm. Participants saw the target slide, followed by five test slides that consisted of a second (identical) target slide mixed randomly with the four changes, shown one at a time. Each test slide was shown for 2 seconds with a 2-second pause for responding. After each test slide, participants indicated on an answer sheet whether that slide was the same as the target slide or not.

PROCEDURE

Participants were run in groups of 5 to 12 people by either a male or female experimenter. The first task was the appearance recall task. For this task, participants were told,

> We are interested in people's accuracy in remembering information they have seen in slides. The slides will be projected for brief periods and you will have an opportunity to indicate what you remember about what you saw. You will need to pay close attention because the slides will be projected for seconds only.

Specific instructions that followed depended on the experimental condition. In the verbal condition, the 16 target slides were presented in a random order. In the nonverbal condition, the order was the same, but altogether there were 96 slides (16 target slides each followed by 5 test slides, each of which was shown for approximately 2 seconds). In addition, in the cognitive load conditions an additional 16 slides showing a random string of five digits were shown (one before each target slide). Following the recall task, participants were administered a battery of other instruments in the order listed (see the following).

SCORING OF RECALL ACCURACY

Verbal response format. Responses were scored by three coders by comparing responses to the target slide. Appearance recall was scored as in Study 2. Responses that were ambiguous or not confirmable were not scored (these were infrequent). Points were not given for descriptions of behavior (e.g., hands on hips), personal judgments (e.g., ugly), repetitions, information that was a given (e.g., curly hair would receive a point for curly but not for hair because hair was a given), or tautologies (e.g., sleeveless vest would receive only one point). Accuracy was the average number of correctly recalled details ($M = 9.89$, $SD = 1.85$, range = 5.81 to 15.06).

Nonverbal response format. Accuracy was calculated as the proportion of items for which the participant selected the correct test slide and only the correct test slide (i.e., the slide that was the same as the target slide). Nonverbal appearance accuracy was $M = .52$ ($SD = .20$, range = .06 to .94).

OTHER INSTRUMENTS

Digit-span test. The digit-span test from the Wechsler Adult Intelligence Scale (Wechsler, 1955) was adapted for group administration. The experimenter said, "I am going to say some numbers. Listen carefully, and when I am through write them down right away." The experimenter then read nine number strings of increasing length (from 3 to 11 numbers). Participants were given time to write down the numbers after each string was read. Accuracy was the proportion of strings remembered without error. The average score was .51 (SD = 0.14, range = .11 to .78).

Bem Sex-Role Inventory. The 20 communal and 20 agentic items from the BSRI (Bem, 1974) were administered, each with a 7-point scale anchored by *never or almost never true* to *always or almost always true*. Sample feminine items are soft-spoken, loves children, and gentle, and sample masculine items are self-sufficient, forceful, and analytical. Cronbach's alphas for the communion and agency scales were both .78. The average communion score was 4.90 (SD = 0.68, range = 2.25 to 6.55), and the average agency score was 5.08 (SD = 0.72, range = 3.30 to 8.95).

Importance of appearance questionnaire. The same 14-item questionnaire on importance of appearance was given as in Study 1. Cronbach's alpha was .82. The average score was 4.48 (SD = 0.61, range = 2.43 to 6.00).

Appearance knowledge measure. Participants were given the same task as in Study 1. The average score was 52.41 (SD = 19.19, range = 11 to 129).

Results

GENDER DIFFERENCES

As in Studies 1 and 2 and Horgan et al. (2004), we again found that women scored higher on verbal appearance recall than men did, $t(162)$ = 5.24, p < .001 (M women = 10.60, SD = 1.77; M men = 9.19, SD = 1.66; point-biserial r = .38). For accuracy tested using the nonverbal response format (recognition memory), women were also more accurate on appearance recall than men were, $t(169)$ = 2.82, p < .01 (M women = .56, SD = .19; M men = .48, SD = .21; point-biserial r = .21).

MEDIATION

We examined general memory ability and the communion and agency scales of the BSRI as potential mediators of the aforementioned gender differences. General memory ability (digit span) was not related either to gender, r = –.04, p = .59, or to the appearance recall measures, r = .11, p > .26. General memory was not therefore a mediator.

In terms of the BSRI communion scale, women were more communal than men, r = .37, p < .001, and more

communion was related to both verbal appearance recall, r = .14, p < .07, and nonverbal appearance recall, r = .16, p < .05. However, the partial correlations that controlled for communion were identical to the zero-order correlations of gender with appearance recall. Finally, although men scored higher than women on the BSRI agency scale, r = –.12, p < .05, that scale had no relations with appearance recall, p > .21.

We gave the importance of appearance and knowledge tests and found that women scored higher on importance of appearance, $t(333)$ = 3.67, p < .0001, and also on appearance knowledge, $t(328)$ = 2.58, p = .01. Importance of appearance was related to verbal appearance recall, $r(162)$ = .15, p < .05, but not to nonverbal appearance recall, $r(170)$ = .04, p = .56. Knowledge was related to verbal appearance recall, $r(161)$ = .41, p < .001, and also to nonverbal appearance recall, $r(166)$ = .21, p < .01. Controlling for importance of appearance, the partial r between gender and verbal appearance recall was $pr(161)$ = .36, p < .001, and the corresponding partial r for nonverbal appearance recall was $pr(168)$ = .21, p < .01. Controlling for appearance knowledge, the partial r between gender and verbal appearance recall was $pr(160)$ = .33, p < .001, and the corresponding partial r for nonverbal appearance recall was $pr(164)$ = .20, p = .01. These effects are only slightly smaller than their respective zero-order correlations.

MODERATION

It was anticipated that shorter exposure, longer delay, and cognitive load would all impair accuracy relative to longer exposure, no delay, and no cognitive load. Our goal was to find out whether any of these variables would moderate women's advantage in appearance recall. Accuracy was analyzed with a 2 (exposure: short/long) × 2 (delay: none/delay) × 2 (cognitive load: none/load) × 2 (gender: male/female) between-subjects ANOVA. Separate ANOVAs were conducted for verbal and nonverbal appearance accuracy.

Two of the experimental factors produced significant main effects on accuracy. Shorter exposures produced lower scores for verbal appearance accuracy (p < .01), and cognitive load produced lower scores for nonverbal appearance accuracy (p < .001). For nonverbal appearance accuracy, there were two interactions among factors (Exposure × Load and Delay × Load) that we do not discuss because they do not involve gender. In summary, the experimental variables had some, though not consistent, impact on appearance accuracy.

Moderation would be demonstrated by interactions between gender and the experimental variables. Gender did not interact with any of the experimental factors in two-way, three-way, or four-way interactions (all ps > .12). Thus, the gender effects in appearance recall were not
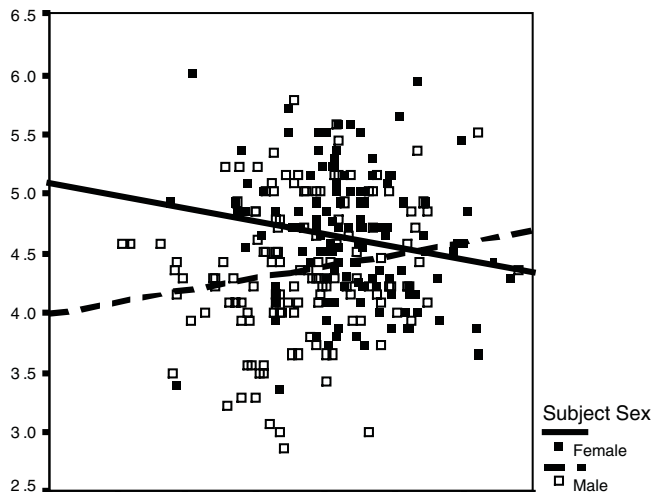
Figure 1   Relation between importance of appearance and appearance recall separately for women and men (Studies 1 and 3 pooled).

Figure 2   Relation between appearance knowledge and appearance recall separately for women and men (Studies 1 and 3 pooled).

affected by delay before responding, length of exposure, and cognitive load.

Another potential moderator was response modality: Did the gender difference vary according to whether accurate responding required the use of language? As stated earlier, the gender differences for the verbal and nonverbal conditions were, expressed as point-biserial correlations, $r = .38$ and $r = .21$, respectively. These two effects were marginally significantly different ($Z = 1.72$, $p < .10$). Therefore, it appears that women's advantage on appearance recall is somewhat larger when verbal language is required.

We also calculated linear regressions, each with appearance recall as the dependent variable (separately for verbal and nonverbal appearance recall) and two predictors (gender and either digit span, agency, communion, importance of appearance, or appearance knowledge). In each case, the interaction of gender and the potential moderator would signify the occurrence of moderation. With two exceptions, none of the interaction terms was significant (all $ps > .15$). The exceptions were a marginally significant interaction effect of gender and communion on verbal appearance recall ($p < .10$) and a significant interaction effect of gender and importance of appearance on verbal appearance recall ($p < .009$).

Note that in Study 1, contrary to the results found here, the Gender × Appearance Knowledge interaction was significant whereas the Gender × Importance of Appearance interaction was not. Because even a nonsignificant result can be based on a large effect, combining the results of different studies can help to obtain a clearer picture of these effects. Because we used the same appearance knowledge measure and the same importance of appearance measure in Studies 1 and 3,
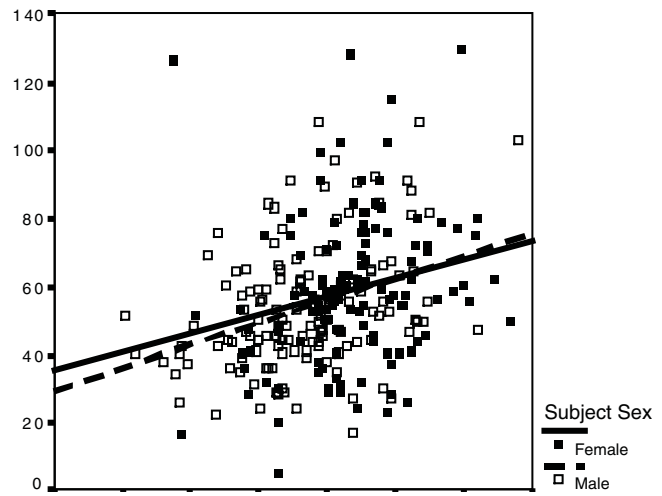
we were able to combine the results of these two studies. We therefore redid the regression analysis with both data sets pooled (Studies 1 and 3) after standardizing each appearance recall measure. To control for study effects, we included study as a variable in the regression analysis.

We calculated a linear regression with importance of appearance, gender, study, and the Importance of Appearance × Gender interaction as predictors. Results showed that there was a significant interaction effect ($p = .006$). The standardized beta coefficient of the interaction term was $-.16$, indicating that the gender difference in appearance recall became smaller as importance of appearance increased. Moreover, as can be seen in Figure 1, men's importance of appearance was positively related to appearance recall, $r(135) = .17$, $p < .05$, whereas women's importance of appearance was negatively related to appearance recall, $r(129) = -.17$, $p = .053$.

We calculated a linear regression with appearance knowledge, gender, study, and the Appearance Knowledge × Gender interaction as predictors. Results yielded a significant interaction effect ($p = .05$). The gender difference in appearance recall became smaller as appearance knowledge increased (standardized beta coefficient of the interaction term was $-.11$). This effect was due to men's more pronounced relation between appearance knowledge and appearance recall than women's, $r(135) = .36$, $p < .0001$, $r(128) = .21$, $p < .02$, men and women, respectively. Appearance knowledge for men more than for women was related to recalling others' appearance (Figure 2).

Discussion

In Study 3, we replicated the gender difference in accuracy of recalling appearance. Moreover, general memory ability, communal and agentic orientation, and appearance knowledge and importance of appearance

were tested for their role as mediators of the gender difference in appearance recall. Results showed that none of them explained the gender difference. With regard to moderation, results showed that the gender difference in appearance recall was unaffected by length of exposure to the target, delay before responding, and cognitive load. However, the response mode in terms of whether it was verbal or nonverbal was related to the gender difference in appearance accuracy. The gender difference was marginally larger in the verbal response condition than in the nonverbal response condition. Interestingly, the effect size for the nonverbal appearance recall gender difference ($r = .21$) was more like the general trend of the previous verbal studies. The verbal appearance recall gender difference of Study 3 ($r = .38$) therefore was unusually big. It has to be noted however that verbal versus nonverbal response modality was not the only difference between the two tasks. For example, in the verbal condition participants could take all the time they wanted to answer, whereas in the nonverbal condition they were limited in time. Moreover, although the nonverbal condition did not require the participant to produce words, it was still a "verbal" task in that it required the participant to read words to achieve accuracy. Therefore, the differences between the verbal and nonverbal response mode should not be overinterpreted also given that they only marginally significantly differed from each other.

The results concerning the gender difference in the relations of appearance knowledge and importance of appearance to recalling the appearance of others are discussed in the general discussion section because they are based on aggregating Studies 1 and 3.

GENERAL DISCUSSION

The goal of the present research was to look for explanations and boundary conditions for the gender difference showing that women are better at recalling others' appearance than men are. In other words, we tested the robustness of this gender difference and looked at whether a series of variables can explain why and when women are better. Using three distinctly different tasks, we corroborated the finding that women have better memory for the appearance of others (Horgan et al., 2004) in three studies. Table 1 presents a meta-analytic summary of the appearance recall gender differences. In this table we list results for the verbal and nonverbal appearance recall conditions from Study 3 separately because these were different groups of participants, making for a total of four independent studies. It is noteworthy that the magnitude of the effect is almost identical to the one reported in Horgan et al. (2004), which was based on five independent studies. Thus, a total of nine studies has converged on the conclusion that

TABLE 1: Quantitative Summary of Gender Differences in Appearance Recall (Studies 1, 2, 3a, and 3b)

Study	Correlation Between Gender and Appearance Recall	N	Z
1	.26**	100	2.60
2	.15[†]	157	1.88
3a	.38***	164	4.87
3b	.21**	171	2.75
Weighted mean r	.25		
Unweighted mean r	.25		
Combined Z	6.05***		

NOTE: Effect sizes are simple two-group comparisons, expressed as point-biserial correlations (r) (dummy coding for gender: male = 1, female = 2). Study 3a is verbal appearance recall, and Study 3b is nonverbal appearance recall (different participants). Combined p is one-tail; ps are otherwise two-tail.
[†]$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

women remember others' appearance better than men. Moreover, homogeneity testing revealed that the four studies reported in Table 1 were homogenous, chi-square ($df = 3$) = 5.45, $p > .10$, corroborating the robustness of the gender difference.

Although numerous potential mediators and moderators were tested, the gender difference in appearance recall remained largely unaffected. We tested whether general task motivation, general memory ability, importance of appearance, appearance knowledge, attention paid to target, gazing at target, and communal or agentic orientation could explain why women did a better job at recalling others' appearance than men did. None of these variables could explain the gender difference. As for moderation, we tested whether general task motivation, importance of appearance, appearance knowledge, attention paid to target, length of exposure to target, delay in responding, cognitive load, and response format (verbal vs. nonverbal) affected the magnitude of the gender difference in appearance recall. We found that importance of appearance and appearance knowledge moderated the gender difference in that more importance of appearance and more appearance knowledge decreased the gender difference. Also, the response format (verbal vs. nonverbal appearance recall) affected the gender difference. It was marginally smaller in the nonverbal than in the verbal appearance recall condition. Of course, there are many more distal explanations that we did not test. We believe however that we included a broad range of different variables that we deemed relevant.

The robustness of the gender difference in appearance recall is striking and may be an indicator that for women it is functional to remember the other's appearance, at least more so than for men. Under an evolutionary perspective, it can be argued that for women, the

most important thing is how they look. Attractiveness is a selective advantage for women when it comes to mate selection (Buss, 1989; Buss & Barnes, 1986). This entails that among women, competition is likely based on appearance: The prettiest is selected by the man with the highest status. In all likelihood, social status for women is based on appearance more so than for men (Cashdan, 1998). Therefore for women, focusing on appearance in social interactions might be functional—at least more so than for men. Social comparison most likely occurs more along the appearance dimension for women than for men. If it is true that social status is linked to appearance more for women than for men and that social comparison involves appearance more so for women than for men, women should have better memory for appearance (which they have). Moreover, we would predict that in a socially competitive as compared to a collaborative situation, the appearance recall gender difference should emerge even more clearly because social status and therefore social status indicators (e.g., appearance cues for women) are supposed to be more salient. If women are more likely to use appearance to assess social status in others than men are, women's advantage in recalling others' appearance might even be more pronounced when social competition is involved. This is the direction in which future research could head.

Possessing more appearance knowledge and giving high importance to appearance both decreased the gender difference in appearance recall. These effects were mostly due to men profiting more from an increase in appearance knowledge and in importance of appearance than women did. Thus, we found an indication for different mechanisms at work for women and men when it comes to recalling another's appearance. The more men reported that appearance was important to them and the more knowledge they had about appearance, the better they were at recalling the appearance of others. For women, the effect went in the opposite direction for importance of appearance and was significantly less pronounced for appearance knowledge. This could be explained by men being novices and women being experts in everything that concerns appearance. A novice is not very skilled at the task at hand. Therefore, motivation to improve (i.e., importance of appearance) and prior knowledge about the topic (i.e., appearance knowledge) both can help performance. Experts on the other hand might be very much attuned to appearance details (e.g., which kind of fabric the pants were) so that their higher task-specific motivation (e.g., importance of appearance) does not help them in a recall task like the one in the present study, which did not require much attention to appearance details. Note that the smaller (in absolute magnitude) relation between importance

of appearance and appearance recall and between appearance knowledge and appearance recall for women was not due to a restriction of range problem.[2]

The robustness of the gender difference in appearance recall is striking and reminiscent of the gender difference in nonverbal sensitivity. Very much like in the nonverbal sensitivity literature, our understanding of the gender difference in recalling another's appearance is not very advanced. The present series of studies used a systematic approach and tested a comprehensive number of potential mediator and moderator variables to try to discover the why and when of the gender difference.

NOTES

1. We also calculated a 2 (participant gender) × 2 (target gender) ANOVA. Results revealed no significant target gender main effect, $F(1, 150) = 0.67$, $p = .42$, and no significant Target Gender × Participant Gender interaction effect, $F(1, 150) = 0.01$, $p = .97$.

2. For Study 1, the range of appearance recall was –2.56 to 1.27 and 1.94 to 1.59; for importance of appearance, 3 to 5.08 and 3.46 to 5.69; for appearance knowledge, 17 to 108 and 5 to 126 (men and women, respectively). For Study 3, the range of appearance recall was 5.81 to 15.06 and 5.94 to 14.88; for importance of appearance, 2.86 to 5.79 and 2.43 to 6.00; for appearance knowledge, 14 to 108 and 11 to 129 (men and women, respectively).

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