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# We Value What Values Us: The Appeal of Identity-Affirming Science

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*Members of the public (Study 1;* n = *184) and university students (Study 2;* n = *101) evaluated a piece of research and indicated their support for its continuation. The research findings were held constant, but the methods that revealed those findings were attributed to either neuroscience or social science, and the conclusions based on those findings were biased either in favor of men or in favor of women. Study 1 revealed that participants were more positive about research that affirmed their gender identity and that was based on neuroscience rather than social science. Study 2 found this pattern to be apparent in more specialist samples. Indeed, participants with some scientific training were more influenced by research that affirmed the reader's gender identity. Participants with less scientific training, in comparison, were more influenced by the type of science described when making judgments about the value of the research. Contrary to popular claims, this suggests that scientific knowledge alone is no protection against the effects of bias on research evaluation. Implications for the practice and popularization of science are discussed.*

**KEY WORDS:** social identity, motivated reasoning, evaluations of science, popularization, bias, gender



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> Science is facts; just as houses are made of stone, so is science made of facts; but a pile of stones is not a house, and a collection of facts is not necessarily science.
>
> Jules Henri Poincaré (1854–1912)

Society is increasingly exposed to scientific research, scientific findings, and scientific facts. At the same time, cynicism and mistrust of scientists within the community is increasing (e.g., House of Lords, Science and Technology Committee, 23rd Feb., 2000). Among some sections of the community, rejection of science is based on the challenge it presents to cherished beliefs (e.g., opposition to evolutionary theories among some religious communities). Equally, the media and the public are often derided by scientists as sites of distortion as scientific findings drift from specialist forums and into the public domain—perhaps disguising the role scientists themselves play in selling their work to the media and public alike (Miller, 1995). Finally, scientific findings are routinely brought to bear on debates that are otherwise political (e.g., when alleged evidence for gender differences in ability is used to explain gender differences in societal attainments; see Summers, 2005, for a recent and controversial example). These phenomena all point to political aspects of scientific production, evaluation, and use.

Against the backdrop of science that is increasingly politicized, it is interesting to take a closer look at the link between scientific findings and public acceptance. What kinds of science do the public find interesting, and when do they put their trust in the products of scientific research? Conversely, when the public resist scientific findings, on what basis is that resistance explained? Essentially, the question is: When do people accept that “scientific findings” represent “actual facts”? To provide some answers to this question, the present research considers the social and psychological factors that might guide scientific evaluations, beyond the scientific merits of research itself.

One possibility is that people evaluate scientific findings on the basis of a fairly simple representation of what science is (i.e., a stereotype). Findings that are produced by science that conforms to people’s expectations might be more likely to be accepted as facts. Consistent with this notion, research has shown that people are prone to use heuristics when making judgments about when to accept or reject new information (Eagly & Chaiken, 1993; Petty & Caccioppo, 1986). For example, when people are not motivated to think carefully about an issue (e.g., because it is not important to them; Johnson & Eagly, 1989) or they lack the ability to do so (e.g., because they lack necessary knowledge; Johnson, 1994), they rely more heavily on simple decision-making rules (e.g., that experts always know best; Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo, & Schumann, 1983). Under these conditions, information is accepted to the extent that it is presented in a manner that conforms to these rules (e.g., people will accept information from experts and reject information from nonexperts).

Much of the general public lacks specialized scientific knowledge. Despite this, the public is likely to have an image of what “real science” looks like (e.g., on the basis of media exposure). In the absence of detailed knowledge, people might evaluate, and accept, scientific findings on the basis of whether such findings are produced by research that conforms to their stereotypes.

If this is the case, improved ability to decode scientific research should lead to more balanced responses to scientific research. Indeed, it is often claimed that improved knowledge would minimize misinterpretations of scientific research by the public (e.g., Rensberger, 2000). Yet while knowledge might move people beyond purely superficial considerations, whether or not this necessarily leads to more informed judgments is a separate issue. Across a range of domains, research indicates that people evaluate information in self-serving ways. For example, even loosely held beliefs tend to persist when discredited (Anderson, Lepper, & Ross, 1980). This is in part because beliefs are cognitively easier to form than they are to dismantle. Motivational factors also come into play. People preferentially seek belief-confirming evidence and avoid, or downgrade the validity of, disconfirming evidence (Lord, Ross, & Lepper, 1979). They are also likely to be particularly skeptical about information that holds negative implications for the self (Ditto & Lopez, 1992; Kunda, 1987; Liberman & Chaiken, 1992) and to evaluate such information according to more stringent criteria than information which has positive implications (Chaiken, Liberman, & Eagly, 1989).

Direct self-interest may not even be necessary to bias people’s interpretations of the facts. Beliefs, attitudes, and actions are guided by membership in social groups in a variety of domains. Group memberships are important for individual self-definition (i.e., identity) and self-evaluation (e.g., self-esteem; Tajfel, 1982; Tajfel & Turner, 1979), and people strive to maintain positive images of the groups to which they belong (i.e., a positive social identity that can contribute to a positive sense of self-esteem). Accordingly, people develop theories about the social world which frame their identities in a positive light (e.g., Hewstone, 1990), and they accept new information when it accords with such social identities, at times irrespective of personal self-interest (Ellemers, Spears, & Doosje, 2002; see also Sherif, 1935, for a discussion of the role of social groups in anchoring judgments).

Just as is the case for the population at large, studies suggest that scientists’ judgments about the qualities of research are equally colored by their biases (e.g., Mahoney, 1977, 1979; Peters & Ceci, 1982; see also Starbuck, 2003). For example, Mahoney submitted for review versions of a single article that varied only in the direction of the results obtained. Reviewer’s judgments of the quality of the research methods, and willingness to accept the manuscript for publication, reflected their prior known directional preferences. This suggests that expertise alone does not guard against biased interpretations of science. Scientists are, after all, ordinary people themselves. Indeed, this is a core notion in critiques of empiricism within the social sciences (e.g., Jasonoff, Markle, Petersen, & Pinch, 1995). According to this perspective, scientists are unable to detach themselves from the other identities they hold and the perspectives these afford (e.g., based on gender, class, race, or sexuality). Along these lines, a second aim of this research was to investigate the extent to which salient identities influence the scientific theories that people prefer, and the scientific findings they are likely to accept.

It seems reasonable to assume that so-called ordinary people would be influenced by a range of factors when evaluating science, including stereotypic images of what science is and motivations to preserve a positive image of the social groups to which they belong. However, despite suggestions to the contrary, it remains unclear whether scientific training alone is sufficient to counteract such tendencies. To provide some answers to the question of when "scientific findings" become accepted as "actual facts," the present research examined the relative influence of each of the above factors (i.e., identity concerns and stereotypic views of science) on people's willingness to accept scientific findings and to put faith in scientific research. First, we explored this issue using a general community sample. After this, we repeated the study using a university sample in an attempt to replicate, and identify boundary conditions for, the findings of the first study.

## Study 1

### *Method*

*Participants.* One hundred and eighty-four members of the public were surveyed on a train traveling between two British towns ($n = 91$) or in various public places within the centre of one of these towns ($n = 93$). Of these, 84 were male (46%) and 100 were female (54%). Participants were aged between 13 and 84 years (mean age = 34.57 years; $SD = 15.22$). Participants were equally divided across each of the bias conditions, with men and women represented approximately equally within each of these cells.

*Design and materials.* The experiment had a 2 (gender of participant: male, female) × 2 (science type: neuroscience, social science) × 2 (bias: pro-male, pro-female) between-groups design. Male and female participants were presented with one of four different versions of a scientific article which orthogonally manipulated the gender bias of the research conclusions (pro-male or pro-female) and the stereotypicality of the science on which those conclusions were based (neuroscience or social science). Participants were told that the articles had been taken from a recent edition of a popular science magazine, but in fact they had been written specifically for the study. Articles were approximately equal in length, ranging between 325 and 337 words long, and began with identical lead paragraphs that informed readers of new scientific research that was shedding light on gender differences.

To manipulate science type, the article described research being conducted by Alex Hutchison, identified as a professor of neuroscience (or social science) who had been investigating gender differences in brain function (or decision-making styles) using state-of-the-art brain imaging technology (or in-depth interviews and surveys). This research, the article explained, uncovered systematic differences in brain functioning (decision-making styles) such that women expended more cognitive effort when thinking about complex rather than simple tasks. To reinforce the manipulation, the articles describing neuroscience research included pictures of brain scans comparing male and female brain activation (e.g., as in Phillips, Lowe, Lurito, Dzemidzic, & Matthews, 2001), whereas the articles describing social science research were accompanied by pie charts that graphically depicted men and women's different preferences.[1]

To manipulate gender bias, the identical finding was explained in one of two ways. In the pro-female condition, it was concluded that this gender difference demonstrated that women's thinking was deeper than men's and that they were more willing to take on challenging tasks. In contrast, men, it was concluded, displayed more simplistic thinking and a preference for "the easy option." In the pro-male condition, the article concluded that this gender difference demonstrated that men's thinking is quick and efficient and that men were better able than women to identify tasks that would lead to success. Women's thinking, on the other hand, was described as convoluted and more likely to lead to failure. To reinforce the manipulation, the pro-male articles were accompanied by the banner "Men think quicker than women" and the pro-female articles were accompanied by the banner "Women think more deeply than men."

*Procedure.* Participants were approached by members of the research team while in transit on an intercity train or in the main street of the town centre. The experimenters explained that they were conducting a survey on public ideas about scientific research. After giving their consent, participants were presented with one of four versions of an article describing the findings of a piece of recent scientific research. After reading the article, they were asked to summarize briefly in their own words the key points of their article. This was done to ensure that participants had read the research and reflected on its meaning.

Participants then indicated on 7-point semantic-differential scales what they thought about the findings presented in the research (*boring–interesting, false–true, unpersuasive–persuasive, unconvincing–convincing, invalid–valid*). These five items were combined and averaged to form an index of participants' *evaluations of the findings* ($\alpha = .88$). On a second set of semantic-differential scales, participants evaluated the research methods used in the study they had read (*unscientific–scientific, inappropriate–appropriate, unsystematic–systematic,*

[1] It is possible that the inclusion of brain scans versus pie charts manipulated the vividness of the article, rather than just the stereotypicality of the science as was intended. Pilot testing ($N = 20$), however, revealed that the neuroscience and social science articles were rated equally in terms of visual impact (as measured by an averaged index of the adjectives *vivid, impressive, dramatic, colorful, graphic, eye-catching, boring, dull, dreary, unexciting*; $\alpha = .92$, $t_{(18)} = 1.28$, $p = .22$) and perceived professionalism (as measured by an averaged index of the adjectives *well-presented, professional*; $\alpha = .88$, $t_{(18)} = 1.07$, $p = .30$).

*superficial–rigorous, biased–unbiased*). These five items were combined and averaged to form a composite measure of participants' *evaluations of the research methods* ($\alpha = .87$).

Finally, participants evaluated the merits of the research more globally. On a series of 7-point scales, they were asked to what extent they agreed or disagreed that the research they had read about (a) should continue, (b) deserved more government funding, (c) made a significant contribution to the understanding of human nature, and (d) was beneficial. These items were combined and averaged to form a single measure of *willingness to support continued research* ($\alpha = .85$). Participants also indicated their gender and their age.

## *Results*

To examine participants' reactions to the research, a series of 2 (gender: male, female) × 2 (science type: neuroscience, social science) × 2 (bias: pro-male, pro-female) between-groups analyses of variance were conducted on the three dependent measures (evaluations of the findings, evaluations of the research, willingness to support the research). Initially, these analyses were conducted with survey location (train or town centre) as a fourth factor. This did not affect the results and accordingly the effects of this variable are not considered further.

Examination of participants' *evaluations of the research findings* revealed a significant main effect for participant's gender, $F_{(1,176)} = 4.25$, $p = .04$, $\eta^2 = .02$. Women evaluated the research findings more positively than did men (*M*s = 4.51 and 4.11 respectively). However, this effect was qualified by a significant interaction between participant's gender and the bias of the research conclusions, $F_{(1, 176)} = 14.48$, $p < .001$, $\eta^2 = .08$. As can be seen in Figure 1, men were more positive towards research findings when the conclusions were biased in favor of men rather than women (i.e., when the research affirmed their male identity). Women, too, were more positive toward research that was biased in favor of their gender group rather than in favor of men. Follow-up analyses indicated that divergence between male and female responses was more pronounced in reactions to the pro-female article, $F_{(1, 176)} = 16.73$, $p < .001$, $\eta^2 = .09$, than in reactions to the pro-male article, $F_{(1, 176)} = 1.57$, $p = .21$, $\eta^2 = .01$.

A similar pattern emerged when this analysis was repeated on participants' *evaluations of the research methods*. Women were somewhat more positive about the research methods than were men (*M*s = 4.40 & 4.05 respectively), $F_{(1,174)} = 3.34$, $p = .07$, $\eta^2 = .02$. In addition, respondents were generally more positive about research which drew pro-female rather than pro-male conclusions (*M*s = 4.42 & 4.03, respectively), $F_{(1, 174)} = 3.90$, $p = .05$, $\eta^2 = .02$. Both these effects were, however, qualified by a significant interaction between the factors, $F_{(1, 174)} = 15.96$, $p < .001$, $\eta^2 = .08$. Women considered the research methods to be more scientific to the extent that its conclusion presented women's abilities in a positive light (*M*s: pro-female = 4.98, pro-male = 3.82). Men, on the other hand,

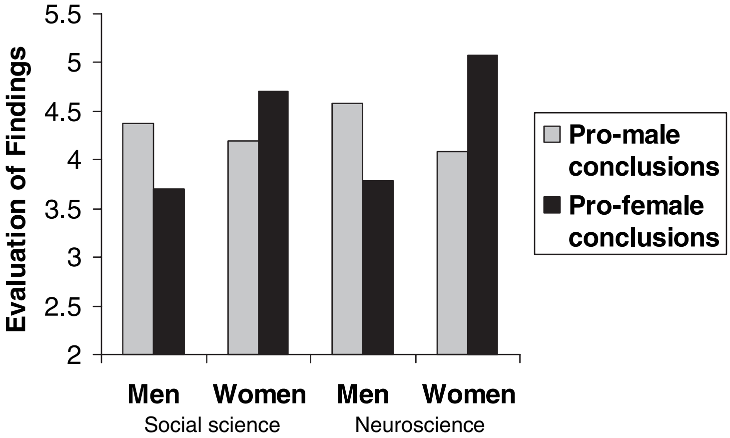


**Figure 1.** Study 1: Evaluations of research findings as a function of participant gender, gender bias of research conclusions, and science type.

were more favorably disposed to the research when it drew conclusions that presented men's abilities positively (*M*s: pro-female = 3.85, pro-male = 4.24). As before, men's and women's evaluations of the research methods diverged more strongly in responses to the pro-female article, $F_{(1,\ 174)} = 16.72$, $p < .001$, $\eta^2 = .09$, than they did in responses to the pro-male article, $F_{(1,\ 174)} = 2.38$, $p = .12$, $\eta^2 = .01$.

The above findings suggest that positive evaluations of scientific research are predicated on a match between the gender of the reader and the implications of the research findings for that gender group. Although this effect has been found to be particularly pronounced for women, a similar, albeit weaker, pattern of responses was evident among men. In comparison to the effects of bias, however, the manipulation of science type had little impact on responses.

However, when the analysis was repeated on the measure of participants' *willingness to support continued research*, there was a reliable effect of science type, $F_{(1,\ 176)} = 5.50$, $p = .02$, $\eta^2 = .03$. Respondents were more inclined to fund research when it was neuroscientific rather than social scientific (*M*s = 4.19 & 3.72). In addition to this independent effect of science type, the interaction between bias and gender was again significant, $F_{(1,\ 176)} = 12.80$, $p < .001$, $\eta^2 = .07$. As for the previous dependent measures, men were also somewhat more willing to support continued funding of research when its conclusions were pro-male (*M* pro-male = 4.07, *M* pro-female = 3.58), $F_{(1,\ 176)} = 2.79$, $p = .10$, $\eta^2 = .02$. Women instead gave more support to the research when the conclusions were pro-female (*M* pro-male = 3.58, *M* pro-female = 4.55), $F_{(1,\ 176)} = 11.89$, $p = .001$, $\eta^2 = .06$. Thus support for continued research was contingent both on whether the research was stereotypically scientific and, independently, on whether its conclusions affirmed participants' gender identities.

### *Discussion*

The findings of this study suggest that evaluations of the quality of scientific research, and willingness to support funding for that research, are influenced by identity concerns. Respondents were more interested in research when it portrayed their own gender group in a positive light (i.e., when the research affirmed their social identity; Oakes, Haslam, & Turner, 1994). More importantly, they also described such research as being more scientific and more worthy of continued funding. This suggests that scientific conclusions are more likely to gain currency, and to be treated as fact, to the extent that they furnish people with a positive sense of identity, irrespective of the actual scientific merits of the research. Independent of the role of identity concerns, there was some, albeit weaker, evidence that support for continued research was also based on whether or not the research conformed to a stereotypic image of science.

Given the use of a general community sample in this study, it could be argued that respondents were swayed by gender-biased conclusions because they did not understand the science and thus were unduly influenced by simple biases. Thus, a caveat on our conclusions might be warranted: research is likely to gain *popular* currency to the extent that it flatters people's social identities. It seems reasonable to contend, however, that those with more knowledge of science would not be so easily led by such identity concerns. Indeed, commentators of science routinely lament public misunderstandings of science and suggest improved knowledge is the key to minimizing biased interpretations of scientific research (e.g., Rensberger, 2000).

In light of the possibility that the effects Study 1 might have been attributable to a lack of scientific knowledge in the public at large—and given the suggestion that improved knowledge should ameliorate the tendency to be swayed by bias—a second study was conducted. Study 2 replicated Study 1 using a population of university students who, in addition to being from a more uniform educational background, were also likely to differ systematically in their level of scientific expertise (i.e., depending on whether they were arts or science students). Thus it was possible to see whether the pattern observed in the first study generalized to a second population, and within that population, whether the tendency to evaluate scientific research on the basis of identity concerns was limited to (or exaggerated among) those likely to have less scientific knowledge.

## Study 2

### *Method*

*Participants.* One hundred and one British university students participated in this study. Respondents included equal numbers of males (51%) and females (49%), who ranged from 18 to 48 years ($M = 19.83$, $SD = 2.98$), and who were distributed across years of study (60% had been enrolled for one year or less; the remainder had been enrolled for between 1.5 and 4 years). More importantly, an equal mix of students from nonscience (e.g., arts, languages, drama, history, philosophy; 56%) and science backgrounds (e.g., chemistry, biology, physics; 44%) was recruited. Participants were told that the research was concerned with people's attitudes and opinions about scientific research. No reward or other incentive was offered for participation.

*Design and materials.* The design and materials used in this study were identical to those used in Experiment 1. Again, participants read one of four versions of a scientific article (social science versus neuroscience; pro-male versus pro-female) and gave their evaluations of (a) the findings (five items, with wording as for Experiment 1, $\alpha = .83$), (b) the research methods (five items, with wording as for Experiment 1, $\alpha = .70$), and (c) indicated their support for continued research (a single item measure in this study).

## *Results*

First, to examine the overall pattern of responses, a series of 2 (gender of respondent: male, female) × 2 (science type: neuroscience, social science) × 2 (bias: pro-male, pro-female) analyses of variance were conducted on each of the three dependent measures (evaluations of the findings, evaluations of the research, and agreement that the research should continue).

Examination of respondents' *evaluations of the research findings* revealed significant main effects for both the respondent's gender, $F_{(1,98)} = 6.03$, $p = .02$, $\eta^2 = .06$, and type of science, $F_{(1,98)} = 5.08$, $p = .03$, $\eta^2 = .05$. Across conditions, women gave more positive evaluations of the research findings than men (*M*s = 4.44 & 3.91, respectively). Across gender groups, respondents evaluated neuroscience findings more positively than social scientific findings (*M*s = 4.42 & 3.99, respectively). There were no further effects of research bias and no interactions among the factors.

Analysis of *evaluations of the research methods* revealed a marginally significant effect for science type, $F_{(1,99)} = 3.72$, $p = .057$, $\eta^2 = .04$. Again, the neuroscientific research tended to be evaluated more positively than the social scientific research (*M*s = 4.11 & 3.76, respectively). Beyond this, though, there was also a significant interaction between respondent's gender and the gender bias of the research, $F_{(1,99)} = 4.13$, $p = .05$, $\eta^2 = .04$. As can be seen in Figure 2, regardless of its type, research was evaluated more positively to the extent that it was biased in favor of the respondent's gender identity. Men evaluated research more positively when it favored men (and not women), and women evaluated research more positively when it favored women (and not men). Follow-up tests revealed that this was largely due to a significant difference between men's and women's evaluation of the pro-male article, $F_{(1,99)} = 6.19$, $p = .01$, $\eta^2 = .06$. Indeed, responses to the

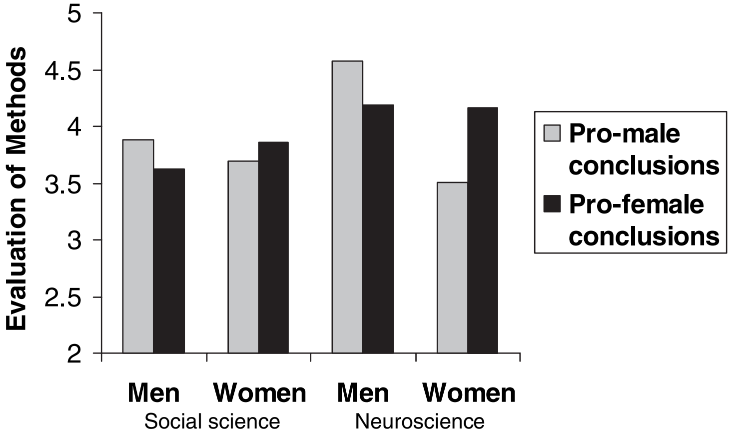


**Figure 2.** Study 2: Evaluations of research methods as a function of participant gender, gender bias of research conclusions, and science type.

pro-female article did not differ significantly as a function of gender, $F_{(1, 99)} = .16$, $p = .69$, $\eta^2 = .00$.

Analysis of respondents' judgments about whether the research should continue revealed a similar, though less significant, interaction between respondent's gender and the direction of bias in the conclusions, $F_{(1,99)} = 3.56$, $p = .06$, $\eta^2 = .04$. Again, men were more likely to recommend that the research should continue to the extent that its conclusions presented men in a favorable light (*M*s: pro-male = 4.46, pro-female = 3.46). Women, on the other hand, were more inclined to recommend that the research should continue when its conclusions presented women in a positive light (*M*s: pro-male = 4.38, pro-female = 4.40). In this instance, follow-up analyses revealed that the divergence between male and female evaluations was stronger in relation to the pro-female article, $F_{(1,99)} = 5.96$, $p = .02$, $\eta^2 = .06$, than the pro-male article, $F_{(1, 99)} = .05$, $p = .83$, $\eta^2 = .00$.

*The role of expertise.* The patterns above broadly replicate those observed in Study 1. That is, in a second sample, people's conclusions about the validity of research (although not the veracity of its findings) again depended on whether the conclusions affirmed their own gender-based social identities. To explore whether this pattern could be partially attributed to deficits in scientific knowledge, level of scientific expertise (as judged by degree program: arts versus science) was entered as an additional variable in the previous analyses. This variable did not moderate any of the effects reported above. Contrary to what might have been expected, there was also no evidence of a Science Type × Expertise interaction on any of the dependent variables, all *F*s < 1. Science students, for instance, did not give extra weight to scientific methods that matched their degree-based identity (i.e., by giving preference to neuroscience over social science). This suggests that gender-based identities were more salient while reading the article. These analyses also demonstrate that scientific knowledge did not minimize the effects of gender-based identity concerns on research evaluation.

To explore this further, the analyses were repeated separately for arts and science students. In all cases the pattern reported above was more, rather than less, pronounced among science students (who were assumed to possess greater scientific knowledge) than it was among arts students (who were assumed to possess less scientific knowledge). Among science students, the interaction between research bias and respondent's gender approached significance for evaluations of the research findings, $F_{(1,43)} = 3.34$, $p = .076$, $\eta^2 = .09$, and judgments about whether the research should continue, $F_{(1,43)} = 3.49$, $p = .07$, $\eta^2 = .09$, and was significant for evaluations of the research methods, $F_{(1,43)} = 4.14$, $p = .05$, $\eta^2 = .11$. In contrast, none of these effects approached significance for arts students, all $F\text{s} < 1$. Among this group, responses were instead contingent on the type of science with which they were presented. Arts students tended to evaluate the findings from neuroscience research more positively than social science findings, $F_{(1,55)} = 3.38$, $p = .07$, $\eta^2 = .07$, and they evaluated neuroscience research methods more positively, $F_{(1,56)} = 4.36$, $p = .04$, $\eta^2 = .08$. Arts students did not, however, make recommendations about whether research should continue based on its type, $F_{(1,55)} = .04$, $p = .84$, $\eta^2 = .00$.[2]

## Discussion

Replicating the pattern observed in Study 1, the results of Study 2 showed that scientific research was evaluated more positively to the extent that it conformed to a stereotypical image of what science is and to the extent that it affirmed the reader's gender-based identity. Moreover, these effects were found to operate differentially within subsamples that were presumed to vary in their level of scientific expertise. Arts students, who should have less scientific expertise, evaluated scientific findings largely on the basis of simple stereotypes. That is, they were more likely to accept scientific findings as facts to the extent that those findings were produced by stereotypically "scientific" science (i.e., neuroscience rather than social science) and thus appeared to be guided by simple heuristics when judging the validity of scientific research (Eagly & Chaiken, 1993; Johnson, 1994). Although science students, who should have more scientific expertise, were less inclined to be guided by such stereotypes, their judgments were *more* influenced by identity concerns than arts students. Science students were more inclined to accept scientific findings and gave more positive evaluations of the research that

[2] In addition to the measure of expertise based on degree program, additional analyses tested whether the patterns observed could be accounted for by length of study (in years) and differences in political ideology (as measured by social dominance orientation—a value orientation associated with conservatism and more prejudiced attitudes; Sidanius & Pratto, 1999). Controlling for these variables did not change the pattern of results.

produced these, to the extent that the findings were interpreted in a way that affirmed their gender identity. These findings question the notion that improved knowledge should automatically result in more objective responses to scientific research. Our results suggest that while specialist knowledge may ameliorate one type of bias (the reliance on a stereotyped image of science), it may not necessarily lead to judgments that are entirely value-free or unbiased.[3]

## General Discussion

The two experiments we have reported provide novel insights into how "research findings" are evaluated and when these are likely to become accepted as "facts." The research reveals that people's judgments about science are influenced significantly by identity concerns. Across both studies, people were more positive about research when its conclusions affirmed their gender identities. That is, men were more positively disposed to research that presented men in a favorable light, and women were more positively disposed to research that presented women in a favorable light. Moreover, research that affirmed the reader's gender identity was more likely to be seen as worthy of continuation and worthy of continued funding. Evidence for the role of simple stereotypes in influencing evaluations of research was also evident across the two studies; however, the effects of this variable were less consistent.

Scientific commentary often laments the public's tendency to be swayed by biased readings of scientific research and point to improved knowledge as the cure for this problem (e.g., Rensberger, 2000). Following this line of reasoning, it was possible that the readiness with which people accepted the different interpretations of scientific findings presented in Study 1 might be attributable to the generally low level of scientific expertise in the public at large (the population sampled in Study 1). However, contrary to this view, Study 2 replicated this pattern of results within a population that had a uniformly high level of education (i.e., university students) but that included individuals who were likely to vary in their level of scientific expertise (because they were arts or science students). Moreover, this study revealed that the effects of bias were not limited to those with reduced specialist knowledge—indeed the opposite was true. Although arts students (lower expertise) were more likely to be guided by stereotypes when judging the validity of research, science students (higher expertise) were more likely to be guided by the implications of the research for their gender-based social identities.

### *Implications*

The pattern of findings is consistent with theoretical perspectives that emphasize the role of heuristics in judgment and decision making (e.g., Eagly & Chaiken,

[3] We thank an anonymous reviewer for making this point so clearly.

1993) and with perspectives that emphasize the role of identity factors in informing these judgmental processes (e.g., Oakes et al., 1994; Turner, 1991). We believe this demonstrates the utility of adopting a social psychological approach to understanding public responses to scientific research. When applied to the understanding of scientific practice, we also believe these processes have quite far-reaching implications.

One conclusion from this research is that the transition from "scientific finding" to "accepted fact" will be more swift when research (a) affirms important social identities for those in a position to evaluate it and, to a lesser extent, (b) when it "looks like" science (i.e., conforms to a stereotypic image of scientific research). This suggests that researchers who arrive at equally valid conclusions using nonstereotypic methods and whose findings challenge evaluators' valued social identities are likely to be frustrated by resistance to their ideas. This conclusion does not undermine the value of the scientific process (which may indeed provide identity-affirming evidence), but rather highlights the social psychological processes involved in the public acceptance of that science.

However, a second conclusion is that ordinary people are not the only ones who fall prey to the attractions of identity-affirming science. Our findings show that scientists-in-the-making (i.e., those studying science) are no less prone to accept the validity of research on the basis of subjective concerns. Indeed, in our research they were *more* likely to do so than students without scientific training. Thus, researchers who produce knowledge that challenges dominant identities might be frustrated by resistance to their ideas not only outside, but also within the scientific community (see Haslam & McGarty, 2001; Kuhn, 1970, for discussions along these lines).

Scientific knowledge might equip people with the tools to engage with scientific research, but that knowledge can equally be used to discredit findings that are at odds with what one would like to believe (Chaiken et al., 1989; Lord et al., 1979; Mahoney, 1979). Although our data point to this possibility, examination of the underlying processes through which people arrived at their judgments was beyond the scope of the present research. Notwithstanding this, the observed pattern raises questions about whether judgments about science can ever be value-free. On the basis of the present findings, we would suggest the answer is "no" and that identity factors necessarily come into play when people evaluate science.

In this respect, we have assumed that gender-based identities would be most salient to people in the reported experiments. However, particularly among specialist audiences, one's identity as a scientist might be equally important. The absence of degree-based identity biases in Study 2 suggests that gender identities were, indeed, more salient among our participants. In addition, it is likely that gender identities were more *consequential*. That is, the research findings linked gender identities to differences in value in a way that was not true for scientific identities. Notwithstanding this, it would be interesting to further explore how concerns based around scientific identities interact with other identities when experts evaluate scientific research. At the very least, the identity of scientist should carry with it certain norms and values (i.e., neutrality and impartiality) that might work against tendencies toward bias.

While we believe that the preferential acceptance of identity affirming science is an important issue, scientists themselves may be more concerned by biased ignorance of science and public preferences for less reliable sources of information (e.g., bogus or pseudoscience). How people understand, evaluate, and accept pseudoscientific theories and the research that purports to validate these is an interesting question. Although beyond the scope of the present findings, we speculate that similar processes operate in this context. Pseudoscience routinely alludes to stereotypically scientific processes and thus may be uniquely powerful because it has both the appearance of science and typically presents a message that people want to hear (i.e., affirms important aspects of personal or social identity).

More generally, if it is the case that both scientists and the public are more inclined to support science that makes "us" look good (whoever we may be), and which conforms to shared beliefs about what science should look like, then the more challenging and potentially revolutionary aspects of scientific pursuit are likely to be overlooked—not because they are any less likely to be true but simply because they are less likely to win favor (Haslam & McGarty, 2001). This being the case, there is a danger that pressures to engage in acceptable scientific endeavor will lead to science that is, in the philosopher Kuhn's (1970) terms, increasingly normalized. In one sense, our research confirms the existence of processes that philosophers and sociologists of science have long argued need to be accounted for in our understanding of scientific progress (e.g., Feyerabend, 1965; Gilbert & Mulkay, 1984; Kuhn, 1970). By putting some empirical meat on the philosophical bone, and in showing these processes at work in the evaluation of current scientific fashions, the present findings are a powerful and timely reminder of the importance of the social psychological dimensions of science as it is practiced and appraised.

Reflecting on the well-known quotation from Poincaré with which this article was prefaced, we must submit that while science may be built on facts, what qualifies as a fact is not set in stone. Instead what comes to be accepted as scientific fact is the outcome of a process in which different identities and associated worldviews are contested. Among other things, science is politics. Accordingly, we see that social psychological and political forces shape individuals' perceptions of the facts—both among those involved in the creation of scientific knowledge and among those who consume it.

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