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Automatic Ingroup Bias as Resistance to Traditional Gender Roles?

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Abstract

Traditional roles are problematic for women because they constrain their life choices. Therefore, women have a vested interest in challenging them. We argue that women can resist pervasive traditional roles by showing automatic ingroup bias. In two studies we used an associative procedure to expose two groups of women to stereotypical vs. counter-stereotypical roles, and measured implicit ingroup bias with an evaluative decision task. Study 1 shows that women activated ingroup bias when they were exposed to stereotypical roles and targets appeared in a stereotype-congruent context (kitchen). Study 2 shows that automatic ingroup bias was activated only when gender roles were salient. Further, stereotypic role associations promote negative emotions, and increased persistence on a stereotype-relevant performance task in women.

Keywords

ingroup bias, stereotypes, identity threat, gender roles, resistance



Social identity theory argues that low status groups are motivated to contest their negative identity (Tajfel & Turner, 1979). This can take the form of rejecting negative stereotypes, or otherwise affirming the group through in-group bias against the disadvantaged group (Hewstone, Rubin, & Willis, 2002; Reynolds, Oakes, Haslam, Nolan, & Dolnik, 2000; Spears, Jetten, & Doosje, 2001). In the present research we extend this argument, previously assessed on *explicit* measures, by examining the automatic reactions of women to traditional roles as a form of *implicit* resistance. We define implicit resistance as a motivated shift towards implicit attitudes that favor the ingroup under conditions that could be seen as threatening for the group identity. Thus when the value of the group is questioned, implicit resistance would imply affirming the group value by activating implicit ingroup bias.

Whereas several studies have shown that in-group bias emerges in response to in-group threat (e.g., Cadinu & Cerchioni, 2001; Mullen, Brown, & Smith, 1992), there are good reasons to suspect that this resistance may not occur at the implicit level. Just as non-prejudiced people may have negative stereotypes of minority groups at the implicit level, members of such minorities themselves may also suffer from chronic exposure to negative ingroup images implicitly (Devine, 1989; Livingston, 2002). Nevertheless, women actually do not show evidence of legitimizing their disadvantaged situation using the IAT (Rudman & Goodwin, 2004). According to these authors their pro-female bias is robust. So there is some hope that women are able to contest identity threat even implicitly. In line with this, previous research shows implicit stereotype reversal in reaction to identity threatening conditions (de Lemus, Spears, Bukowski, Moya, & Lupiáñez, 2013; Ramos, Barreto, Ellemers, Moya, Ferreira, & Calanchini, 2016). The present research builds on these previous findings and extends them to the use of implicit ingroup bias as a form of resistance to traditional gender stereotypes.

Automatic Activation of Gender Stereotypes and Ingroup Bias

The automatic activation of gender stereotypes has been widely explored in the literature (e.g., Blair & Banaji, 1996). Further, evidence of implicit ingroup bias has been previously found using gender categories and positive stereotypes in the IAT (Rudman & Goodwin, 2004). De Lemus, Moya, Bukowski, and Lupiáñez (2008) examined gender priming effects for competence and warmth traits in Spain. They found that, independent of valence, competence traits were activated when primed with male faces, whereas warmth traits were activated when primed with female faces¹. Therefore, using an evaluative decision task

¹ Because de Lemus et al. (2008) was published in Spanish, we provide here a brief description of the methods used and results obtained for comparison purposes. Materials used: 8 competence traits, 4 positive (Capable - Capaz, Intelligent - Inteligente, Demanding - Exigente, Rational - Racional) and 4 negative (Inefficient - Ineficaz, Unreliable - Inconstante, Incompetent - Incapaz, Intransigent - Intransigente), and 8 warmth traits, 4 positive (Kind - Amable, Pleasant - Agradable, Sensitive - Sensible, Emotional - Sentimental) and 4 negative (Gossip - Cotilla, Closed-minded - Intolerante, Hostile - Hostil, Frivolous - Superficial). The evaluative priming task used was the same as in Study 1 from de Lemus et al., 2014, using only a short SOA condition. Results showed a significant Gender x Dimension interaction, $F(1, 42) = 5.53, p = .02$, not moderated by valence ($F < 1$), indicating a stereotype congruency effect.

(Fazio, Jackson, Dunton, & Williams, 1995), there was evidence of stereotype activation but no sign of ingroup bias using male or female faces as primes.

In this research we adopt the methodology of de Lemus et al. (2008) to examine whether implicit ingroup bias activates in response to traditional roles. The hypothesis that women's automatic ingroup bias is at least partly activated as a response to identity threat has not been directly tested. That is the goal of this research.

Implicit Resistance to Traditional Roles

Women are bombarded daily with stereotypical instances that subtly remind them to follow the norm. Even when they are aware of these, they might not always have the time or resources to *explicitly* confront them. We argue that women are motivated to resist such identity threats and they show it even at the implicit level. This does not imply that they do not respond explicitly to the threats if they are given the opportunity to do so. But whereas this explicit resistance might be sometimes constrained by the situation, *resistance can also be activated (and measured) implicitly*. Explicit forms of resistance (e.g., support for collective action) may also occur in response to extensive exposure to threatening stimuli (e.g., Grant & Brown, 1995). What is of interest here is whether such motivational processes also operate at the implicit level.

We argue that resistance is a motivated response even when it occurs at the implicit level. Motivational processes operate implicitly (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Glaser & Kihlstrom, 2005). For instance, chronic egalitarian goals can prevent the activation of implicit stereotypes (Moskowitz, Gollwitzer, Wasel, & Schaal, 1999; Moskowitz, Salomon, & Taylor, 2000), and goal pursuit can operate without conscious intention (Bargh et al., 2001). Some previous research already supports the idea of implicit resistance. De Lemus et al. (2013) found that women *extensively exposed to* stereotypical role associations (i.e., men-office, women-kitchen) reverse gender stereotype activation. That is, women activated more competence when primed with women (vs. men) and more warmth when primed with men (vs. women). These data imply that although a stereotypical association between sex and social roles is activated, this does not lead to the activation of role-congruent traits but rather triggers an associative contrast effect (role-incongruent traits are activated). Likewise, Ramos et al. found that women who observed sexist interactions between men and women reversed gender stereotypes using an IAT and Go/No-go association task (Ramos et al., 2016). Therefore, one way to contest traditional stereotypes is to inhibit (or even reverse) their expression as a form of contrast.

Another form in which sexist roles can be resisted is by expressing ingroup bias. Asserting or affirming the value of the group is a well-known means of countering such threats (e.g., Branscombe, Schmitt, & Harvey, 1999; Hewstone et al., 2002; Tajfel & Turner, 1979). However, there is no clear evidence that this can occur at the implicit level and thus forms our focus: we examine whether implicit ingroup bias is used as a “resistance strategy”, along with other coping strategies such as behavioral persistence in a counter-

stereotypical task, supporting collective actions (van Zomeren, Postmes, & Spears, 2008), and emotional reactions. We consider implicit ingroup bias a form of resistance when it *reverses* the negative value of the group implied by the associations being primed (e.g., in response to stereotypes that imply a lower status/value of the group).

Overview of the Research

To investigate this question we measure the activation of implicit ingroup bias after exposing women to stereotypical or counter-stereotypical roles. Social roles represent the status difference between genders in society and are considered the source of much stereotyping and prejudice (e.g., Eagly, Wood, & Diekmann, 2000). In the current research, we expose women to pictures of men and women disproportionately represented in stereotypically female (domestic kitchen) and male (office) contexts (as in de Lemus et al., 2013).

This associative paradigm differs from others used to train new associations as an intervention to reduce prejudice (cf., Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000) because it allows the manipulation of the relation between gender and stereotypical *roles* rather than asking participants to intentionally select the counter-stereotypical alternative response. Further, it emphasizes the pervasiveness of social roles (by repetition in several blocks), rather than presenting a (typically one-off) subtype or inconsistent exemplar (cf. Blair, Ma, & Lenton, 2001). This is important because it is the *pervasiveness* of gender role distributions what can be threatening (e.g., Schmitt, Branscombe, & Postmes, 2003). Repeated exposure to stereotypic roles should activate gender identity and its related stereotypes in an incidental way (Abelson, Dasgupta, Park, & Banaji, 1998) resembling everyday conditions, where people are routinely exposed to a gendered division of labor (Eagly & Steffen, 1984). It is both subtle (because discrimination is implied by the role distribution), but also powerful (because the distribution implies it is pervasive). At a purely associative level, we might expect such exposure to *reinforce* gender stereotype activation. However because such a stereotypic manipulation can be appraised as threatening (Branscombe et al., 1999) we propose that it should trigger a motivation to affirm the ingroup value through *implicit* ingroup bias.

After exposing women to traditional versus non-traditional roles, automatic ingroup bias is measured using an evaluative decision task (Fazio et al., 1995). In this task, faster responses to positive words and slower responses to negative words primed with the ingroup (vs. outgroup) would indicate ingroup bias. Therefore, our main dependent variable, ingroup bias, is operationalized as an interaction between Gender of the prime x Valence of the target stimuli.

We test the hypothesis of implicit resistance (in the form of ingroup bias) in two studies. In Study 1 gender neutral words (i.e., not related to stereotypes) are used as targets of the evaluative decision task. We hypothesize that participants will activate ingroup bias in response to stereotype exposure. In Study 2 we use competence and warmth

words as targets. Resisting stereotypes on the stereotypical status-defining dimensions might be particularly difficult, because of social reality constraints (Ellemers, 1993; Spears et al., 2001). For instance, it might be harder to show ingroup bias on competence, which is traditionally not associated with women. Further, salience of gender roles in the evaluative decision task is manipulated to test whether the implicit resistance effect is specifically triggered by social roles and not gender categorization *per se*. The effects of gender role exposure on emotions and motivated behavior (i.e., persistence on a gender-relevant task) are also examined. We hypothesize that participants will activate ingroup bias in response to stereotype exposure only when social roles are primed. Also, participants exposed to stereotypes should be more motivated to persist in a subsequent task to disprove stereotypes.

Study 1

Our first experiment aims to study the influence of stereotypical vs. counter-stereotypical gender-role associations on implicit ingroup bias. We expect that exposure to traditional stereotypes will enhance automatic ingroup bias as a form of resistance (Hypothesis 1). By contrast, exposure to counter-stereotypical associations implies higher competence for women and is consistent with egalitarian motives. This condition highlights the instability of the ingroup's lower status position, decreasing the level of perceived threat. Therefore, to test Hypothesis 1 we predict an Exposure x Gender x Valence interaction.

In previous research, de Lemus, Moya, Lupiáñez, and Bukowski (2014) found that the classical gender stereotype pattern (men-competence, women-warmth) was activated among women participants when primes appeared in the context of an office (that resembles the power distribution in society), but not in the context of a home kitchen (that reinforces the traditional female role, presumably threatening women's identity). Consistent with these previous findings, automatic resistance might be more easily found in the kitchen context (arguably more threatening for the ingroup) than in the office context (Hypothesis 2), hence we predict that role context (kitchen vs. office) will moderate the Exposure x Gender x Valence interaction.

We also measure women's emotional reactions explicitly, as well as support for collective actions and attitudes towards men. We predict participants will show more negative emotions, support for collective actions and less positive attitudes towards men after stereotypical exposure (vs. counterstereotypical) (Hypothesis 3).

Method

Participants and Design

A total of 53 female first year students at the University of Granada participated in this experiment for course credit. Sixteen male participants were excluded from the analyses.

The experiment was a 2 (Exposure: stereotypical vs. counter-stereotypical) x 2 (Gender target: male vs. female) x 2 (Role Context: office vs. kitchen) x 2 (Valence: positive vs. negative) design. The first factor was manipulated between participants (Phase 1), whereas the other three were manipulated within participants in the evaluative priming task (Phase 2).

A small to medium effect size based on our previous work using a similar task and design (de Lemus et al., 2013, 2014) is expected. A power analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) using ANOVA repeated measures, within-between interaction as the statistical test, would indicate that a sample of 38 participants is required to detect a medium effect size ($\eta^2 = .19$) with a power of $1 - \beta = .80$ when $\alpha = .05$, for 2 groups and the minimum number of measurements (2).

Materials and Procedure

Participants completed the task in a lab with low lighting, seated approximately 50 cms away from the 15" monitor and using a keyboard input. They were told that the experiment was designed to study decision making processes about social stimulus.

Pictures (Primes)

We used pictures of 7 men and 7 women in their mid-twenties with an emotionally neutral face, appearing in different contexts (kitchen, office). Stimuli examples are shown in Figure 1. Pretest of the prime stimuli showed that the pictures in which a man (vs. a woman) appeared in an office or women (vs. men) appeared in a kitchen were seen as currently more prototypical in society. Further, women in the office were evaluated more positively than



Figure 1. Examples of stimuli used as primes in all studies.

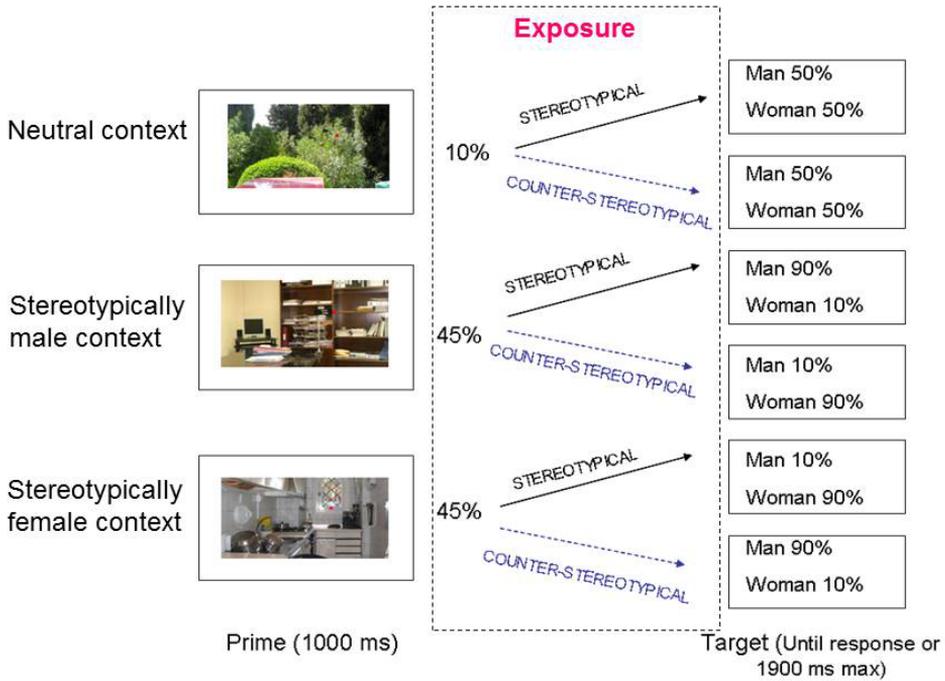


Figure 2. Exposure (identity threat manipulation) phase for Studies 1 and 2. Participants’ task was to categorize the gender of the target.

in the kitchen, whereas there was no difference between the two contexts for men (see de Lemus et al., 2014)².

Exposure Phase: Gender Categorization Task

Participants were asked to categorize the target person appearing in the image as a man or a woman, only when the person appeared indoors (i.e., kitchen or office), withholding responses when s/he appeared outdoors. This instruction was given in order to focus participants’ attention on both the context (respond or not) and the gender (woman/man), but not on the gender-context association, in order to avoid participants’ awareness of the purpose of the study. In 90% of the trials a person appeared in a kitchen or an office (45% of the trials each context), whereas in the remaining 10% of the trials, the target appeared outdoors. The same 6 persons (3 women and 3 men) appeared in the kitchen and the office contexts, while 2 different men and 2 women appeared outdoors.

The procedure is represented in Figure 2. An image of the context with a fixation point was presented during 1000 ms, followed by the target person superimposed on it, until the

² Pictures were not pretested for being recognized equally fast as “woman/man” and as “kitchen/office”.

participant gave a response or for a maximum of 2000 ms. One group was presented with 90% of the women in a kitchen, and 90% of the men in an office (stereotypical exposure group); whereas another group of participants was presented with 90% of the men in a kitchen, and 90% of the women in an office (counter-stereotypical exposure group). The proportion of men and women appearing outdoors was equal (50-50%). Participants were presented with 160 trials in total.

Test Phase: Explicit Measures and Implicit Ingroup Bias

After the exposure phase participants were asked to report their negative emotions (e.g., angry, humiliated; 5 items: $\alpha = .84$), and positive emotions (e.g., proud; 2 items: $\alpha = .66$) in a random order.

Next, participants were asked to do an evaluative decision task in which they had to categorize a target word preceded by a pictorial prime (man or woman) as positive or negative as quickly as possible while minimizing mistakes (Fazio et al., 1995). Target words were 12 positive and negative words not related to stereotypes (e.g., happiness, luck, vomit, pain), taken from the standard IAT measure translated to Spanish (Rodríguez-Bailón, Ruiz, & Moya, 2009). Each target word was preceded by pictures of men and women appearing either in a kitchen, an office or an outdoors context as in Phase 1, but with different persons appearing in them. The stereotype related contexts appeared in 80% of the trials (40% each), and the neutral context appeared in 20% of the trials as a filler. Participants were presented with 8 blocks of 60 trials each, a total of 480 trials, of which 384 (the ones in which stereotype contexts were primed) were analyzed in a 2 (Gender) x 2 (Role context) x 2 (Valence) design.

The priming sequence is represented in Figure 3. A fixation point (red dot) appeared on a picture of the role context for 1000 ms, followed by the prime (man or woman) which

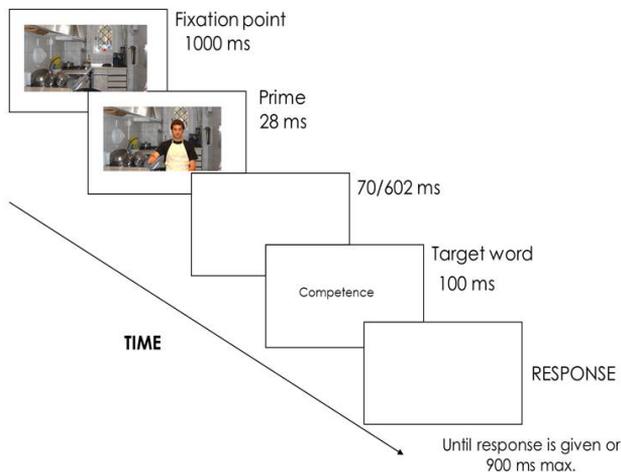


Figure 3. Priming sequence in the evaluative decision task (Study 1 and 2-role priming condition).

was presented for 28 ms. After an interval of 70 ms in which the screen was blank (ISI), the target word appeared at the centre of the screen for 100 ms, followed by a blank screen, until a response was given or to a time limit of 900 ms.

Finally, participants were asked to fill in a questionnaire measuring their support for normative (4 items from 1 (not at all) to 11 (very much), e.g., “Actively lobbying for women’s interests”; $\alpha = .64$) and non-normative collective action (5 items; e.g., “Blackmailing an unsupportive government official”; $\alpha = .77$) to increase gender equality (adapted from Tausch et al., 2011), as well as an open-ended attitude measure (Esses & Zanna, 1995) in which they could generate a maximum of ten typical characteristics of men and rate their valence on a 7-point scale ranging from -3 to +3 .

Results

Manipulation Check: Gender Categorization Task

The mean RTs in Phase 1 were introduced into a 2 (Exposure: stereotypical vs. counter-stereotypical) x 2 (Gender target: male vs. female) x 2 (Role Context: kitchen vs. office) repeated measures ANOVA. The results showed a significant interaction of Exposure x Gender target x Role context, $F(1, 51) = 37.50, p < .001, \eta^2 = .42$. As expected, exposure facilitated responses to the trained associations. That is, in the stereotypical exposure condition participants categorized women more quickly ($M = 561$) than men ($M = 626$) when they appeared in a kitchen, $F(1, 51) = 6.58, p = .01, \eta^2 = .11$, and they tended to categorize men more quickly ($M = 575$) than women ($M = 610$) when they appeared in the office, $F(1, 51) = 2.75, p = .10, \eta^2 = .05$. In counter-stereotypical exposure, participants showed faster reaction times for men ($M = 579$) than for women ($M = 670$) when they appeared in the kitchen, $F(1, 51) = 13.20, p < .001, \eta^2 = .21$, and for women ($M = 574$) than for men ($M = 680$) when they appeared in an office, $F(1, 51) = 24.27, p < .001, \eta^2 = .32$. These results indicated that the exposure phase successfully managed to associate gender and context differentially.

Implicit Ingroup Bias: Word Categorization as a Function of Role Priming

Trials with incorrect responses (7%) or no response (2.6%) were eliminated from the analyses. Trials with reaction times faster than 200 ms (1.2%) were equally discarded, considered as anticipations.

Mean RTs were analyzed by means of a 2 (Exposure: stereotypical vs. counter-stereotypical) x 2 (Gender target: male vs. female) x 2 (Role Context: kitchen vs. office) x 2 (Valence: positive vs. negative) repeated measures ANOVA, where the first factor was manipulated between participants, and the rest within participants (see Table 1).

We found a main effect of valence, $F(1, 51) = 5.55, p = .02, \eta^2 = .10$, indicating a facilitation effect for positive (vs. negative) words. This might be due to a negative delay, (e.g., Wentura, Rothermund, & Bak, 2000). There was also a main effect of role context, $F(1, 51) = 6.15, p = .02, \eta^2 = .11$, indicating faster RTs for trials primed with a kitchen (vs. office)

Table 1*Mean RTs and SDs (in Parentheses) for the Test Phase in Study 1*

		Kitchen		Office	
		Negative	Positive	Negative	Positive
Stereotypic training	Male	431 (38)	441 (44)	435 (47)	438 (45)
		439 (49)	430 (44)	440 (38)	439 (43)
	Female	447 (44)	426 (56)	448 (51)	437 (51)
		444 (46)	427 (55)	460 (48)	435 (48)
Counter-stereotypic training	Male				
	Female				

context, and a significant Exposure x Valence interaction, $F(1, 51) = 6.42, p = .01, \eta^2 = .11$, indicating faster RTs for positive words in the counter-stereotypical condition (vs. stereotypical). This suggests that positive affect is implicitly triggered by counter-stereotypical exposure. The Gender x Valence interaction did not reach significance, $F(1, 51) = 3.46, p = .07, \eta^2 = .06$, although the means are in the direction of ingroup bias.

The predicted Exposure x Gender x Valence interaction (Hypothesis 1) was not significant, $F < 1, ns$. However, in line with Hypothesis 2, which predicted an ingroup bias effect in the kitchen context, results showed a significant 4-way interaction between exposure, gender target, valence, and role context, $F(1, 51) = 4.20, p = .046, \eta^2 = .08$. To examine whether ingroup bias as a response to stereotypic exposure mainly occurred in the kitchen we decomposed the interaction by context. The interaction Exposure x Gender target x Valence approached significance only in the kitchen, $F(1, 51) = 3.44, p = .069, \eta^2 = .06$, but not in the office, $F < 1, ns$. Specifically, in the kitchen, the critical Gender target x Valence interaction was significant in the stereotypical condition, $F(1, 51) = 4.55, p = .037, \eta^2 = .08$, but not in the counterstereotypical one, $F < 1, ns$. In the stereotypical condition, participants responded more quickly to positive words primed with women ($M = 430$) than men ($M = 441$), $F(1, 51) = 3.44, p = .069, \eta^2 = .06$, indicating implicit ingroup bias. No differences were found for negative words, $F(1, 51) = 2.05, p = .16, \eta^2 = .04$. Therefore, a pattern consistent with automatic ingroup bias emerged in the kitchen after stereotypical exposure (see Figure 4).

Self-Reported Measures

The two main scores of self-reported negative and positive emotions after the exposure phase were analyzed in a MANOVA with exposure (stereotypical vs. counter-stereotypical) as an independent factor. Wilks' Lambda showed a significant overall effect of exposure, $\lambda = .87, F(2, 50) = 3.58, p = .035, \eta^2 = .12$. Univariate analyses showed significant effects of exposure only for negative emotions, $F(1, 51) = 7.18, p = .01, \eta^2 = .12$, but not for positive ones, $F < 1, ns$: in line with Hypothesis 3, participants felt more negative emotions in the

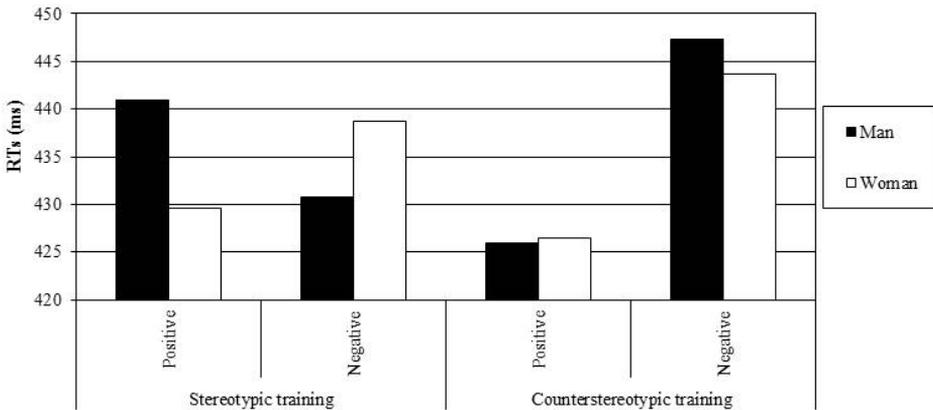


Figure 4. Reaction times (RTs) per stereotype exposure condition in Study 1 for the interaction of Gender x Valence in the kitchen context.

stereotypical exposure condition ($M = 2.38$; $SD = 1.31$) than in the counter-stereotypical one ($M = 1.58$; $SD = .78$). Negative emotions did not mediate the effects of exposure on automatic ingroup bias.

Regarding support for normative and non-normative collective action there was no significant multivariate effect of exposure, $\lambda = .92$, $F(2, 50) = 2.07$, $p = .14$. However, univariate F values showed significant effects of exposure for non-normative actions, $F(1, 51) = 4.18$, $p = .046$, and not for normative ones, $F < 1$, ns . Participants supported more radical (non-normative) collective actions in the stereotypical exposure condition ($M = 2.99$; $SD = 2.04$) than in the counter-stereotypical one ($M = 2.08$; $SD = 1.06$). There were no effects on explicit attitudes towards men, $F < 1$, ns .

Discussion

In Study 1 we found initial evidence of automatic ingroup bias activation as a consequence of prior exposure to traditional roles especially in the context in which they are most sensitive to this (i.e., the kitchen). The kitchen might be seen as the most sexist setting as it refers to the traditional 'place for women', and therefore resistance is more easily applied. This is consistent with previous findings showing no stereotype activation in the context of the kitchen vs. the office in similar samples (de Lemus et al., 2014).

Further, participants reported experiencing more negative emotions in the stereotypical (vs. counter-stereotypical) condition. This is important because it seems to rule out the possibility that the manipulation is creating a normative context of traditional gender roles that simply triggers more positive associations with (traditional) women in the categorization task. If that were the case, participants should *not* feel more negatively after the stereotypical exposure, as they did.

Although promising, the implicit effects in this study are not very robust and therefore we conducted one additional highly powered study to replicate the effects. Additionally, we examined whether these results are affected by stereotype content (competence and warmth) and by the salience of social roles (by including a non-role priming condition as a comparison group). Finally, we examined the motivational consequences of stereotype exposure on emotional and behavioral (persistence) measures.

Study 2

In Study 1 we found that women react to stereotypical roles by activating implicit ingroup bias in the kitchen. In Study 2 we wanted to test two boundary conditions for this effect: stereotype content and the salience of social roles.

Previous research has shown that extensive traditional role exposure leads to stereotype reversal when gender categories are salient (de Lemus et al., 2013). Social roles are strongly related to the content of gender stereotypes (Eagly & Steffen, 1984), so reversing stereotypes is a way to challenge these oppressing roles for the ingroup. However, such stereotype reversal effects at the implicit level can be purely associative in nature, based on accessibility processes and not necessarily motivated (e.g., contrast effect; Bless & Burger, 2016; Herr, Sherman, & Fazio, 1983). On the contrary, ingroup bias as a preferential treatment for ingroup members is intrinsically motivated (Brewer, 1999).

In order to examine whether exposure to traditional roles leads to stereotype reversal and/or ingroup bias in Study 2 we used competence and warmth related words as targets. Further, we used the same paradigm as in de Lemus et al. (2013) in which gender categorization was made salient by means of a gender priming task (using faces as primes) and compared it to a task in which social roles were primed as in Study 1. That is, apart from being extensively exposed to (counter)stereotypes, in Study 1 participants were primed with social roles in the evaluative decision task itself. In Study 2 we used two versions of the evaluative decision task after the exposure to (counter)stereotypical associations: one measuring ingroup bias as a function of *roles* as primes (as in Study 1), and a second one measuring pure ingroup bias as a function of priming male vs. female *faces* as primes (as in de Lemus et al., 2013). We compared the effects of (counter)stereotypical exposure in these two tasks in a 2 (Exposure: stereotypes vs. counterstereotypes) x 2 (Role salience: roles vs. faces) between group design.

We argue that stereotypical roles are threatening for women, so only when such roles are primed will we find implicit resistance responses in the form of ingroup bias. Therefore, we expect to replicate the implicit ingroup bias effect found in Study 1 only when participants have been exposed to traditional roles *and* social roles are salient in the subsequent priming task (as in Study 1), but not when just gender is primed with male and female faces (Hypothesis 1). Complementarily, we aim to replicate de Lemus et al.'s stereotype reversal effect when faces are used as primes (Hypothesis 2). In order to check these predic-

tions, we used the evaluative decision task in which content and valence were manipulated orthogonally. Note that in this study the moderating role of context in the evaluative decision task can only be tested in the condition where social roles are salient, but not when only faces are used as primes. For this group, in line with the findings of Study 1, we predict stronger ingroup bias effects in the kitchen context (Hypothesis 3).

Emotions were measured as in Study 1. Note that this measure was *not* taken in de Lemus et al. (2013). We expect to replicate the effect of stereotype exposure on negative emotions from the previous study (Hypothesis 4).

In order to go beyond implicit ingroup bias as a form of resistance, we introduced a measure of persistence in solving a stereotype-related task (spatial problem solving). Spatial ability is an area in which women are stereotypically perceived as inferior to men (see, e.g., Deaux, 1985), therefore it can potentially provoke stereotype threat in women (Steele & Aronson, 1995; Steele, Spencer, & Aronson, 2002). We hypothesize that stereotype exposure will motivate women to disprove the stereotype and persist *more*, showing that they are competent in this domain (Hypothesis 5). Further, we predict that those who activate more implicit ingroup bias to stereotype exposure will also be the ones who persist more in the spatial task (Hypothesis 6).

Method

Participants and Design

A total of 134 female first year students at the University of Granada participated in this experiment in exchange for course credit.

The experiment was a 2 (Exposure: stereotypical vs. counter-stereotypical) x 2 (Role salience: faces vs. role context) x 2 (Gender target: male vs. female) x 2 (Dimension: competence vs. warmth) x 2 (Valence: positive vs. negative) design. The first two factors, exposure and role salience, were manipulated between participants, whereas the other four were manipulated within participants. The main difference from the previous study is that in this case there are two between participants factors, one of them referring to the stereotypical vs. counter-stereotypical exposure phase as in the first study (Phase 1), and the second one referring to the stimuli (faces or social roles) that are used as primes in the test phase (Phase 2).

A small effect size ($\eta^2 = .08$) based on our previous findings (Study 1) is expected. A power analysis using G*Power (Faul et al., 2007) would indicate that a sample of 136 participants is required to detect a small effect with a power of $1 - \beta = .80$ when $\alpha = .05$ (G*Power, Faul et al., 2007).

Materials and Procedure

The materials and procedure used for the exposure phase were exactly the same as those in Study 1. Half of the participants were exposed to stereotypical associations and half to counter-stereotypical ones.

After the exposure phase participants reported their negative ($\alpha = .73$), and positive ($\alpha = .57$)³ emotions. Then, half of the participants from each of the exposure conditions completed an evaluative decision task in which male and female *faces* appeared as primes, whereas the other half of the participants completed a task in which *social roles* were primed.

The procedure of the evaluative priming task was the same as in Study 1 (Figure 3). However, in order to reduce the length of the task and make the number of trials equal for both priming conditions, no neutral context was used and participants were presented with 4 blocks of 64 trials each. Further, competence and warmth traits were used as targets: 8 competence traits, 4 positive (*perseverance - constancia, motivation - motivación, efficacy - eficacia, intelligence - inteligencia*) and 4 negative (*discouragement - desmotivación, unreliability - inconstancia, inefficiency - ineficacia, intransigence - intransigencia*); 8 warmth traits, 4 positive (*kindness - bondad, understanding - comprensión, sensitivity - sensibilidad, friendliness - simpatía*) and 4 negative (*antipathy - antipatía, hostility - hostilidad, tactlessness - indiscreción, "lack of sympathy" - incomprensión*)⁴ (de Lemus et al., 2013, 2014). Each target word was randomly presented preceded by pictures of men and women appearing either in a kitchen or an office context.

After completing the evaluative priming task, participants did a spatial intelligence test, which consisted of drawing a geometric figure without retracing any lines or lifting the pencil from the paper (see Guinote, 2007). They could spend as much time as they wished in solving it. The first two figures were solvable. The solution was shown on the screen after clicking the spacebar. The last task was unsolvable. They were instructed that they could make as many attempts to draw the figures as they wished. If after 5 minutes the participant had not given up on the task, the experimenter would instruct them to leave it and move onto the next task.

Finally, participants were asked to fill in a questionnaire⁵.

Results and Discussion

Manipulation Checks: Gender Categorization Task

As in Study 1, the analysis of the RTs in the gender categorization task indicated that the exposure phase successfully managed to associate gender and context differentially. Interaction of Exposure x Gender target x Role Context, $F(1, 132) = 150.13, p < .001, \eta^2 = .53$.

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Trials with incorrect responses (8%) or no response (3%) were eliminated from the analyses. Trials with RT faster than 200 ms (0.5% of trials) were equally discarded, considered as anticipations.

³ Positive emotions (low reliability) were not included in the analyses.

⁴ All the traits were presented in noun forms (e.g., "comprensión" [understanding]) to avoid male and female endings in Spanish adjectives (e.g., "comprensivo" or "comprensiva" [understanding]).

⁵ Several measures were included in the questionnaire for exploratory purposes, because they are not the main goal of this research and for the sake of clarity and simplicity they are presented in supplementary materials.

Because the scenario (kitchen vs. office) in which primes appeared in the role context condition was nested within the design (it was only introduced in the role context condition), we first conducted a repeated measures ANOVA including this factor, selecting cases just for the role context condition. Mean RTs were analyzed by means of a 2 (Exposure: stereotypical vs. counter-stereotypical) x 2 (Role context: kitchen vs. office) x 2 (Gender target: male vs. female) x 2 (Dimension: competence vs. warmth) x 2 (Valence: positive vs. negative) repeated measures ANOVA. There was no significant main effect of the role context, nor did it figure into any interaction with the other factors, all $F_s < 3.20$, $p_s > .07$. Therefore the moderation by context of Study 1 did not replicate. The data were collapsed across this variable and analyzed with the general design, as described below.

Mean RTs were analyzed by means of a 2 (Exposure: stereotypical vs. counter-stereotypical) x 2 (Role salience: faces vs. role context) x 2 (Gender target: male vs. female) x 2 (Dimension: competence vs. warmth) x 2 (Valence: positive vs. negative) repeated measures ANOVA. The mean RTs per condition are shown in Table 2.

There was a significant interaction of Exposure x Role salience x Gender target x Valence, $F(1, 130) = 4.50$, $p = .036$, $\eta^2 = .033$, not moderated by dimension, $F < 1$, *ns*. To test our predictions, we divided it by priming condition (social roles and faces). In the social role condition, there was a significant interaction of Exposure x Gender target x Valence, $F(1, 130) = 5.20$, $p = .02$, $\eta^2 = .08$. We decomposed the interaction by stereotype exposure. There was a significant interaction of Gender x Valence, $F(1, 130) = 5.32$, $p = .02$, $\eta^2 = .04$, in response to stereotypical exposure but not in the counter-stereotypical condition, $F < 1$,

Table 2

Mean RTs and SDs (in Parentheses) for the Test Phase in Study 2

			Social Role		Face	
			Negative	Positive	Negative	Positive
Stereotypic training	Male	Competence	477 (46)	472 (53)	482 (54)	467 (53)
		Warmth	466 (46)	445 (45)	483 (48)	446 (48)
		Female	Competence	483 (45)	465 (50)	475 (48)
		Warmth	472 (48)	438 (51)	475 (42)	440 (54)
	Male	Competence	466 (49)	434 (46)	483 (57)	462 (55)
		Warmth	460 (53)	422 (53)	469 (51)	439 (61)
Female		Competence	462 (56)	445 (52)	480 (57)	458 (55)
	Warmth	458 (55)	415 (49)	471 (54)	434 (46)	

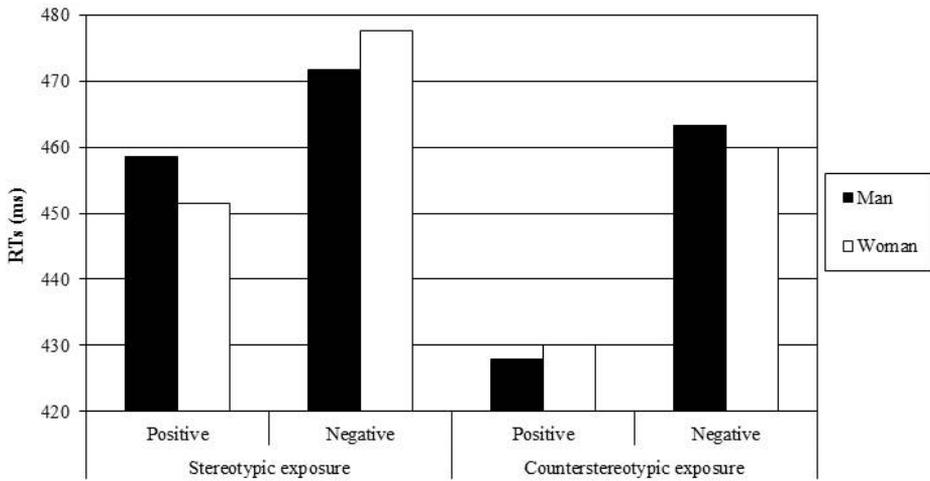


Figure 5. Reaction times (RTs) per stereotype exposure condition in Study 2 for the interaction of Gender x Valence in the role priming condition.

ns. The pattern suggested that men (vs. women) primes activated negative traits more readily, $F(1, 130) = 2.61, p = .11, \eta^2 = .02$, whereas women (vs. men) primes facilitated positive ones, $F(1, 130) = 3.00, p = .09, \eta^2 = .02$ (although this ingroup bias effect is spread over the reliable crossover interaction rather than contained in individual simple effects). Therefore, the results support Hypothesis 2, indicating an ingroup bias effect in response to stereotype exposure when social roles were salient (see Figure 5). These results replicate the finding of Study 1 using competence and warmth related words instead of neutral ones, however the effect does not depend on context. Therefore, Hypothesis 3, which predicted a stronger ingroup bias effect in the kitchen context, was not confirmed. This does not undervalue our main finding referring to the activation of ingroup bias as a function of stereotype exposure. Rather, it suggests that the ingroup bias effect is more robust as it holds across contexts.

Contrary to our fourth hypothesis there was no pattern of stereotype reversal in the face-priming condition, as the Exposure x Role salience x Gender target x Dimension was not significant, $F < 1.3$, ns. Therefore, we did not replicate de Lemus et al. (2013), but also we did not find evidence of stereotype activation as in de Lemus et al. (2008). The fact that participants completed the emotions measure *before* completing the evaluative priming task (which was not the case in de Lemus et al., 2013) seems to have interfered with the activated associations. Still, finding no evidence of stereotype activation suggests that the stereotypes are somewhat adjusted.

Emotions and Persistence

All the variables were analyzed using ANOVA 2 (Exposure: stereotypical vs. counter-stereotypical) x 2 (Role salience: faces vs. roles).

Our fourth hypothesis was confirmed as participants felt more negative emotions in the stereotypical exposure condition ($M = 2.11$; $SD = 1.21$) than in the counter-stereotypical one ($M = 1.58$; $SD = .68$), $F(1, 130) = 10.17$, $p = .002$, $\eta^2 = .07$. This result replicates Study 1.

The analysis of the time spent trying to solve the unsolvable drawing task showed significant effects of exposure, $F(1, 130) = 5.92$, $p = .016$, $\eta^2 = .04$, whereas no effects were found for the solvable tasks, both $F_s < 1.1$, *ns*. Means indicated that participants persisted more when they had been exposed to stereotypic associations ($M = 241.384$ s) than when exposed to counter-stereotypical associations ($M = 181.502$ s) supporting Hypothesis 5.

In order to test Hypothesis 6 about the moderating role of ingroup bias activation on the persistence measure we conducted a 2 (Exposure) x 2 (Role salience) x Ingroup bias (as a continuous predictor, centered⁶) mixed ANOVA on the response time to the unsolvable task. When implicit ingroup bias was included in the design as a predictor, the main effect of exposure was still significant, $F(1, 126) = 5.08$, $p = .026$, $\eta^2 = .04$. Further, there was a significant Exposure x Ingroup bias interaction, $F(1, 126) = 4.35$, $p = .039$, $\eta^2 = .03$. In order to analyze this interaction we conducted a moderation analysis including exposure, ingroup bias and the interaction of both as predictors, and controlling for role salience (faces vs. roles) as a covariate using Hayes (2013) process syntax. The conditional effect of exposure on persistence was significant for participants high in ingroup bias ($t(129) = -3.22$, $p = .001$), but not for participants low in ingroup bias ($t(129) = -.28$, *ns*). That is, confirming Hypothesis 6, those who have higher scores on ingroup bias are the ones who persist more as shown in Figure 6.

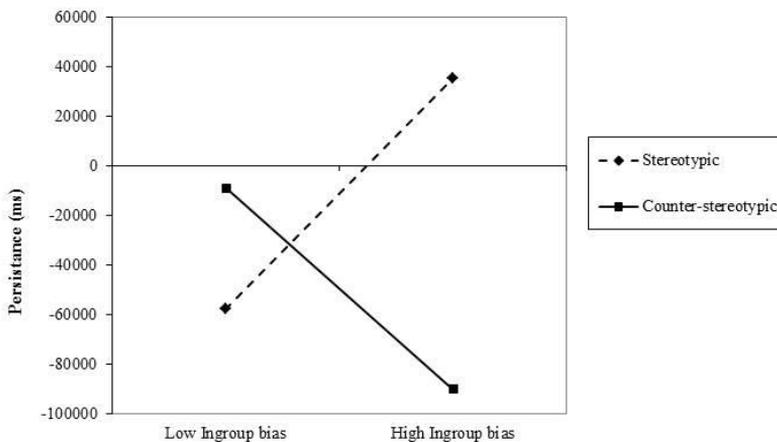


Figure 6. Persistence (in ms mean-centered) for an unsolvable task as a function of implicit ingroup bias, and exposure (controlling for priming) in Study 2.

⁶ An index for implicit ingroup bias was calculated using the following formula: [(Men, Positive) – (Women, Positive)] + [(Women, Negative) – (Men, Negative)]. This way, more positive outcomes show more ingroup bias.

General Discussion

The main goal of our research was to examine the automatic activation of ingroup bias by women, and how these effects are moderated by exposing them to (counter)stereotypic associations between gender and two occupational contexts: kitchen (stereotypically female), and office (stereotypically male). Our findings show that: a) An automatic ingroup bias effect is activated when participants are pre-exposed to traditional stereotypes, but not when counter-stereotypes are used (Studies 1 and 2), b) exposure to stereotypical associations provokes increased negative emotions (Studies 1 and 2), and higher persistence in trying to solve a typically male task whereby those who show more automatic ingroup bias after being exposed to stereotypes, also tend to persist more on this task (Study 2).

This is the first research that shows automatic in-group bias in a disadvantaged group when the status defining dimension (i.e., stereotypic role relations) has actually been *reinforced*. This is important because whereas there is considerable evidence that disadvantaged groups *can* resist and contest their disadvantage on explicit measures (see e.g., Mullen, Brown, & Smith, 1992), there was hitherto little evidence that this can occur implicitly (cf. de Lemus et al., 2013; Ramos et al., 2016). Such implicit responses to threatening information such as stereotype-reinforcing associations can operate even when explicit resistance does not manifest. This suggests that women are vigilant to contextual cues that reinforce the traditional distribution of roles, and are motivated and able to contest them at a more basic level of information processing. This psychological resistance might function as a coping strategy, helping them to protect their self-esteem (Barreto, Ellemers, Scholten, & Smith, 2010).

Importantly, we extend previous findings of implicit stereotype reversals in response to identity threats by showing the effects of such threats on implicit *ingroup bias*. Although stereotype reversal might be an effective way of challenging stereotypes, the underlying mechanism of such effects might not necessarily be motivated by resistance to identity threat. It could be a purely cognitive contrast effect based on associative processes. Hence in this work we go one step further by showing implicit ingroup bias as stronger evidence for our motivated resistance hypothesis.

Although automatic in-group bias in women has been previously analyzed (Rudman & Goodwin, 2004), the identity enhancing function thereof was not previously demonstrated. Rudman and Goodwin (2004) emphasized maternal bonding and male intimidation as triggers of women's preferences for their own group. The present research goes beyond these findings by suggesting that the salience of intergroup conflict and the experience of identity threat arising from gender role distributions might also explain women's automatic ingroup biases. Our results also suggest that implicit resistance is not just triggered by the intergroup salience *per se*, but specifically by stimuli threatening social identity, namely traditional (sexist) social roles. Based on previous findings of gender ingroup bias (Rudman & Goodwin, 2004), it could be argued that our results are due to a *lack of* activation of ingroup bias in the counterstereotypical condition, rather than a reaction to stereotypical

roles. Although plausible, we argue that this explanation is not justified by other research findings using an evaluative priming paradigm as in the present studies. De Lemus et al. (2008) used exactly the same evaluative priming task as in Study 2 to measure ingroup bias and/or gender stereotype activation without exposing participants to stereotypical vs. counter-stereotypical roles a priori, and found that participants showed gender stereotype activation but no sign of ingroup bias. Although this research was not conducted as part of the same design and therefore cannot be considered a control group, we can use those results as a baseline for the task used in the present experimental set. Further, we have replicated this ingroup bias effect in response to subliminal exposure to stereotypes using an evaluative priming task as well as a moral choice dilemma (van Breen, Spears, Kuppens, & de Lemus, 2018b), as well as in a non-gender intergroup context (Spanish-German intergroup relations) (van Breen, de Lemus, Spears, & Kuppens, 2018a). In future studies it would be interesting to check whether the pattern found on IAT with US samples (Rudman & Goodwin, 2004) replicates in a different cultural context and whether it is influenced by stereotypical exposure.

Participants who activated ingroup bias more also persisted for a longer time in solving a problem task when they had been exposed to stereotypic roles. This result indicates a higher motivation to show that women can also solve spatial problems under such threatening conditions (i.e., in a stereotypically male, competence domain). Davies, Spencer, Quinn, and Gerhardstein (2002) showed that the presentation of women in traditional gender roles in advertising increases stereotype threat effects. We do not contradict these findings. Rather, we argue that when traditional stereotypes are *extensively* presented, they are not only activated but reinforced in associative terms, they become threatening for women's identity activating a motivation to disprove them. Therefore, we think that the effects on the persistence measure support our resistance hypothesis and provide converging evidence for it with a different behavioral measure. The effect of higher perseverance on a problem-solving task could be also interpreted as a form of challenging the gender stereotype. Previous research showed that when women's positive social identity is threatened (e.g., in a car parking context) cardiovascular patterns indicating enhancement of challenge responses could be observed (Derks, Scheepers, Van Laar, & Ellemers, 2011). Reframing threat as challenge was also shown to be an effective stereotype threat reduction strategy (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010). We think that the results we obtained on the persistence measure could be interpreted as a form of challenging the competence related aspect of gender stereotypes. Future studies should focus more on the motivational mechanisms that are related to effort investment as a form of coping with identity threat.

We are aware of the limitations in our research. The size of our effects are small, however considering how robust implicit ingroup bias in women is (Rudman & Goodwin, 2004), the fact that this effect can be moderated by stereotype exposure is still of theoretical significance (see Prentice & Miller, 1992). Study 1 is underpowered, however we resolved this in Study 2 with a highly powered replication of our main implicit ingroup bias effect in reaction to stereotypes. Although we assume that the manipulation we use creates a form

of identity threat for many women, we did not directly measure the activation of threat *per se* in these studies. Still, we consider that the evidence of automatic ingroup bias, negative emotions and increased persistence in response to indirectly activated traditional stereotypes supports the claim that identity-based motivational processes are operating. Finally, it could be argued that in order to prove the intergroup nature of our results, we would need a male comparison group. As interesting as examining men's attitudes could be, we do not need it in order to understand women's own responses (in the same way that most literature on prejudice has traditionally focused on studying the majority group perspective without comparing it with minority groups' views). In this research, the counter-stereotypic condition provides a control for our stereotype threatening condition, allowing us to infer the ingroup protecting underlying motivation for women's reactions to stereotypes.

Summing up, the key finding of our research is that women, as members of a disadvantaged group, resist the implications of traditional gender role stereotypes that threaten their group identity, even in an automatic or implicit way, compared to cases when the threat is reduced or not salient. These results support the idea that although positive examples of counter-stereotypical women might reduce the use of stereotypes on an individual basis, acknowledging the pervasive existing disadvantages, and activating their common identity and common fate, is an important motivator for challenging stereotypes and prejudice. The often heard claim that gender inequality no longer exists in our society might actually work against equality to the extent that it lessens women's motivation to challenge an unequal status quo. One way that gender disadvantage and intergroup inequity in general may be perpetuated is through the often subtle, but nevertheless pervasive effects of being exposed to stereotypic roles, and coming to accept this as social reality, not least among the "victim" groups themselves. Much theorizing on the (system-justifying, or inequality legitimizing) effects of ideology suggests it may often work most effectively at the subtle or implicit level. The present research provides some solace against this pessimistic vision by showing that implicit resistance is possible, and may be a vital "firewall" in which disadvantaged groups inoculate themselves against a sense of inferiority and all the negative consequences this can have for esteem and performance.

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Competing Interests

One of the authors (SDL) is a member of SPB's Editorial Board, but played no editorial role for this particular article or intervened in any form in the peer review procedure. One of the authors (MB) is Editor-in-Chief of SPB, but played no editorial role for this particular article or intervened in any form in the peer review procedure.

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The authors have no support to report.

Data Availability

The data analyzed in this paper are freely available via the PsychArchives repository. For further information see the "Supplementary Materials" section.

Supplementary Materials

Supplementary Materials for the present paper contain the data of studies 1 and 2 and additional analyses for study 2.

Index of Supplementary Materials

de Lemus, S., Spears, R., Lupiáñez, J., Bukowski, M., & Moya, M. (2018). Supplementary materials to "Automatic ingroup bias as resistance to traditional gender roles?". PsychOpen <https://doi.org/10.23668/psycharchives.2349>

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