

# THE ROLE OF STEREOTYPE THREAT PERCEPTION AND SUBTLE CUES ON STEREOTYPE THREAT EFFECT

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## Abstract

The manuscript presents the results of an original research.

In the experiments presented, we investigated the role of subtle (Experimenter's gender) and blatant cues (Diagnosticity) on perceived stereotype threat and performance, and showed that perceived stereotype threat can be an informative ecological predictor of performance decrease when added to subtle cue manipulation.

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**Manipulating Stereotype threat in the absence of diagnosticity : the role of stereotype  
threat perception and subtle cues.**

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## **Abstract**

Although stereotype threat phenomenon (ST) has largely been investigated, its manipulation is not systematically ecological. The present research aims to contribute to work on a minimal paradigm of ST using perceived stereotype threat (PST). We investigated the role of subtle (Experimenter's gender) and blatant cues (Diagnosticity). The first study (N=82), using a ST paradigm, showed that participants felt threatened because of subtle cues only when the context was not Diagnostic, and that participants performed lower when greeted by a Female experimenter only when they scored high on PST. The second study (N=132) revealed that participants who felt threatened performed lower in the presence of a subtle cue. These results suggest that PST can not be the only predictor of performance decrease in ecological ST experiments. However, it can be an informative ecological predictor of performance decrease when added to subtle cue manipulation.

*Keywords:* stereotype threat; perceived stereotype threat; contextual cues; minimal paradigm

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## **Do female participants perform better with female experimenters? Methodological considerations for ecological stereotype threat experiments.**

Although research has largely investigated the stereotype threat phenomenon (ST, Steele & Aronson, 1995), its manipulation is mostly experimental hence not systematically ecological. This research proposes to be a first step in identifying a minimal paradigm of ST based on perceived stereotype threat (PST, Chasteen, Bhattacharyya, Horhota, Tam, & Hasher, 2005). In the pioneering studies on ST, Steele and Aronson (1995) observed the detrimental effects of ST on Black participants on a verbal test, and since, many studies have shown the pervasiveness of this phenomenon, as for example on women in math (e.g., Brown & Pinel, 2003; Forbes & Schmader, 2010; Inzlicht & Kang, 2010; Spencer, Steele, & Quinn, 1999). However, ST is a very complex phenomenon that requires numerous conditions to be observed (Crocker, Major, & Steele, 1998; Forbes & Schmader, 2010; Inzlicht & Kang, 2010; Roberson & Kulik, 2007; Steele, 1997; Steele, Spencer & Aronson, 2002). As a consequence, ST is mostly investigated in experimental studies that do not resemble to everyday life experiences.

The following two studies aim to contribute to work on a minimal paradigm of ST. More precisely, we investigate some of the situational cues creating a threatening environment (i.e., independently of Diagnosticity).

To do so, we used the experimenter's gender as a situational cue. According to Strack and Deutsch (2004), it constitutes a "subtle cue" possibly influencing performance and provoking a ST effect in a less conscious way than "blatant cues" (as clearly mentioning the stereotype).

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This is confirmed by Stone and McWhinnie (2008) who showed that in a golf task, women tend to be less precise when facing a male experimenter than a female one.

As experimenter's gender may affect individuals' performance in making them perceiving the context as threatening, we questioned the role of Perceived Stereotype Threat (PST, Chasteen, Bhattacharyya, Horhota, Tam, & Hasher, 2005) on this effect. Does facing an experimenter from a positively stereotyped group can increase the feeling of stereotype threat of a member of a negatively one and therefore negatively impact his performance? Indeed, Chasteen et al. (2005) already showed that PST is an important determinant of memory functioning in elderly, as it influenced the relation between age and memory performance on recall and recognition tasks.

## **Overview of the studies**

The first study proposes to determine to what extent a subtle cue (i.e., the experimenter's gender) may generate a decrease in performances, in comparison with a blatant cue (i.e., Diagnosticity of the instruction). We hypothesize that participants will report more PST when facing a blatant cue than in control condition, and all so the more when this blatant cue is paired with a subtle cue. The performance decrease would be mediated by PST. The procedures performed in these two studies were in accordance with the ethical standards of the national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No ethics committee was consulted for these studies since none existed at Paris-Nanterre University when the studies were conducted. Informed consent was obtained from all participants and none choose to quit the experiment.

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## Study 1

### Material and method

**Participants and design.** 82 male students ( $M_{age} = 19$ ,  $SD_{age} = 3.47$ ) participated in this study in exchange for course credits. We cannot provide Participants were randomly assigned to one of the 4 conditions of a 2 (Diagnosticity: Diagnostic condition vs. Control) x 2 (Experimenter's gender: Female vs. Male) between-subjects design

**Procedure.** At their arrival, whether a female or a male experimenter greeted the participants and asked them to sit in front of a sheet of paper on which all instructions were indicated. The study was presented as commissioned by the National School of Engineering and Technology (CNAM). During the session, the experimenter gave all the instructions orally making salient their gender identity (i.e. saying “I am Mr...” vs. “I am Mrs.”), which was displayed on the top of each page of the questionnaires.

In the Diagnostic condition, participants had to provide their gender and had to read the performance task instructions. They were told that they would have to perform a task linked to sewing. In order to increase stereotype threat, they were also informed that the aim of the study was to test the statement that men tend to be bad at sewing, contrary to women. In the Control condition, participants were told that the aim of the study was to test if a course was easy enough so that students could acquire and retain the substantive knowledge about sewing, without any mention of the stereotype. After reading the instructions, all participants had to complete the Perceived Stereotype Threat scale (PST scale, Chasteen et al., 2005),  $\alpha = .69$ . They were then reminded about the task instructions and had to read the course carefully. The experimenter then took back the course and gave them the questionnaire of the performance task. They had to remind some of the information given in the course about the history of sewing, the tools and

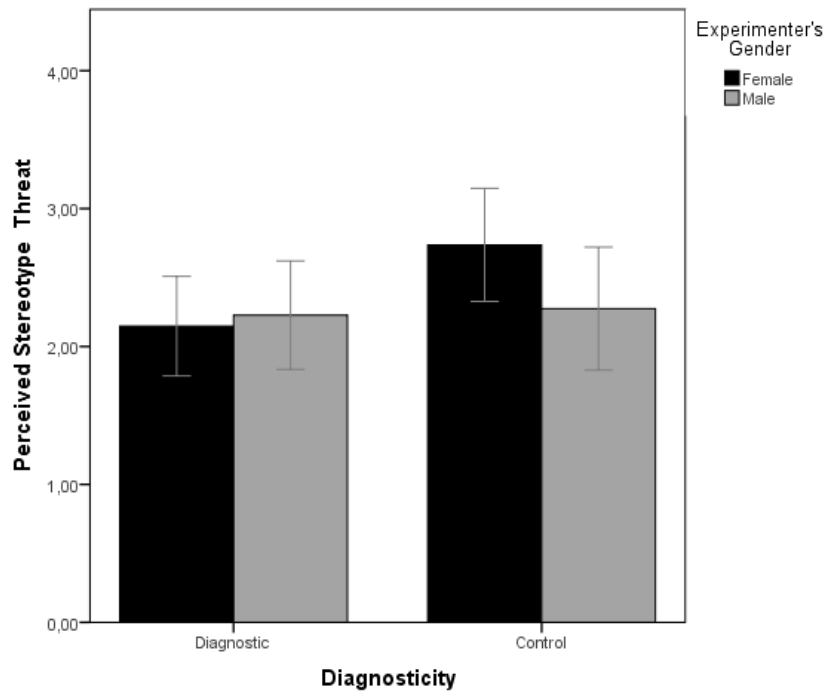
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techniques used in sewing on a MCQ of 13 questions. Finally, they had to estimate their sewing level on a Likert scale ranging from 1 "novice" to 5 "expert". They were then debriefed and thanked. One participant was excluded from the data analysis because he reported not to understand French.

### Results

**Perceived Stereotype Threat.** We first analysed PST scores distribution among experimental conditions using Hayes's Process for SPSS program (Hayes, 2013). This analyses showed no effect of Diagnosticity nor of the Experimenter's gender ( $ps > .10$ ). However, we observed an unexpected reversed effect of Diagnosticity for participants greeted by the female experimenter,  $t(79) = 2.15, p = .04, 95 \% CI [.02, .57]$  participants reporting more PST in the Control condition ( $M = 2.74, SD = 0.82$ ) than in the Diagnostic condition ( $M = 2.14, SD = 0.85$ ). Results of this analyses are reported in Fig1.

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*Fig1.* PST ratings as a function of the Experimenter's gender and Diagnosticity. Errors bars represents 95% CI.

**Performance.** The analysis of performance scores among experimental conditions first revealed a marginally significant reversed effect of Diagnosticity,  $F(1,76) = 2.70$ ,  $p = .10$ , 95% CI [-2.3, .23]. Participants of the Diagnostic condition ( $M = 7.16$ ,  $SD = 1.89$ ) performed better than participants in the Control condition ( $M = 7.05$ ,  $SD = 2.24$ ). This surprising effect was consistent with the manipulation check because the Diagnosticity x PST interaction yielded a marginally significant effect,  $B = .44$ ,  $F(1, 76) = 2.85$ ,  $p = .10$ . The simple effects of this interaction indicated that PST positively impacted performance in the Control condition ( $B = .26$ ) and negatively impacted it in the Diagnostic condition ( $B = -.40$ ). However these effects did not reach significance ( $ps > .28$ ), as the direct effect of PST, the direct effect of the Experimenter's gender, as well as the Experimenter's gender x PST and the Diagnosticity x Experimenter's gender x PST interactions ( $ps > .28$ ).

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In order to clarify these results, we studied this last interaction with Hayes's Process for SPSS program (Hayes, 2013). This analysis showed that the Experimenter's gender played a role in the Diagnosticity  $\times$  PST impact on performance. That is, in the Control condition, we observed a positive effect of the Experimenter's gender on performance for average PST ( $B = .82$ ,  $t(75) = 2.39$ ,  $p = .02$ , 95%CI[.14, 1.5]) and high PST ( $B = .86$ ,  $t(75) = 2.04$ ,  $p = .04$ , 95%CI[.02, 1.7]), suggesting that participants had lower performance with the female experimenter than with the male experimenter. This effect was nonsignificant for participants in the Control condition with low PST ( $p = .14$ ) and for all participants in the Diagnostic condition ( $ps > .44$ ).

### Discussion

These results are unexpected but consistent and very informative. We hypothesised that a Diagnostic context and a Female experimenter would have an additive negative effect on men's performance at a sewing task, through PST. This hypothesis could not be verified because participants seemed to feel threatened only when the experimental context was not initially Diagnostic. We also observed that participants performed lower when greeted by a the Female experimenter only when they scored high on PST.

We argue that participants might use subtle cues as a justification for their failure when they feel threatened by the context. To this end, subtle cues seem to be far more needed in the absence of a blatant cue that would fulfil this justification function. Furthermore, as participants who felt threatened by the context did not necessarily tend to underperform for the task in the absence of a subtle cue, PST can not be considered as a mediator. However, it questions its

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status as a main predictor of performance decrease, and as a moderator of subtle cues effects. Exp2.'s aim is to focus on this PST-subtle cue interaction.

## Study 2

### Material and method

**Participants and design.** 133 female students ( $M_{age} = 19$ ,  $SD_{age} = 2.7$ ) in first year of psychology participated to this study in exchange for course credits. Participants were greeted whether by a female or a male experimenter. No observations were excluded.

**Material and procedure.** The experimental material was similar to the one used in Study 1. The major modification is that the whole study was conducted on a computer running Qualtrics. At their arrival participants were asked to take place in front of the computer and were explained that the study would asked them to test a pedagogical material for math classes. Participants were asked to read the instructions carefully which should be clear enough for them to complete the study without any problem". Thus, participants had no more interaction with the experimenter during the study, who was simply seated at a desk at the entrance of the lab. The survey first asked them to complete the PST scale (Chasteen et al, 2005). Finally, participants had to indicate their age and were thanked and debriefed.

**Sampling.** Based on Exp1. effect sizes, we computed an a priori power analysis using Gpower.

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## Results

**Manipulation checks.** We first analysed reported PST as a function of the Experimenter's gender. This analysis showed that participants did not feel significantly more threatened when greeted by a Male experimenter ( $M = 2.00$ ,  $SD = 0.84$ ) than by a Female experimenter ( $M = 1.83$ ,  $SD = 0.70$ ),  $F(1,133) = 1.59$ ,  $p = .21$ , 95% CI [-.43, .96]. Additionally, we did not observed any effect of reported math level on PST,  $B = -.036$ ,  $t(130) = -.55$ ,  $p = .58$ , 95% CI [-.17, .09].

**Performance.** We computed the PST x Experimenter's gender interaction effect on math scores using Hayes's Process for Spss program (Hayes, 2013). This analysis reported no significant interaction and no Experimenter's gender direct effect ( $ps > .17$ ). Although the effect of PST was marginal as a main effect, it appeared non-significant for participants greeted by a Female experimenter ( $B = -.007$ ,  $t(131) = -.18$ ,  $p = .85$ , 95% CI [-.08, .07],  $\eta^2 < .001$ ) and significant for participants greeted by a Male one ( $B = -.07$ ,  $t(131) = -2.41$ ,  $p = .017$ , 95% CI [-.13, -.01],  $\eta^2 = .084$ ). Participants' scores and regression slopes for the effect of PST as a function of the Experimenter's gender are reported in Fig2.

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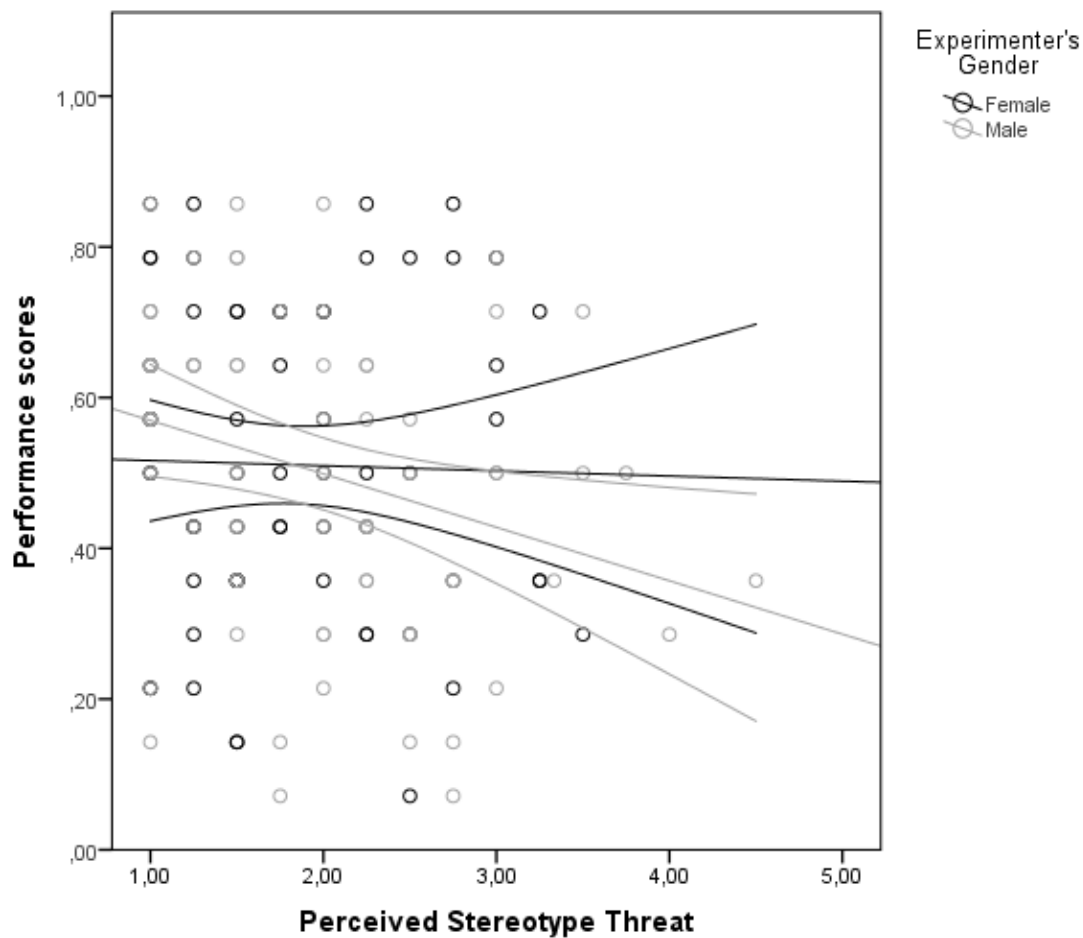


Fig2. Performance scores based on Perceived Stereotype Threat ratings as a function of Experimenter's gender. Curves slopes represent 95% confidence intervals.

## Discussion & Conclusion

As in Exp1., we did not observe any direct effect of the manipulated subtle cue on performance. Additionally, we observed that PST can not be the only predictor of ST effects. Participants who felt threatened performed lower - because of PST - in the presence of a subtle cue. This results confirms our assumptions about the interactional relation between PST and subtle cues already observed in Exp1.

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All these results yielded evidence of a general cognitive consistency (Gawronski, 2012; Gawronski & Strack, 2012) interpretation of ST. The threat induced by a blatant cue may be so strong that one would avoid any other cue that could lead to more uneasiness. However, fearing to confirm the stereotype may lead one to look for justifications of his potential failure (i.e a subtle cue). His performance would be either negatively impacted or preserved whether he manages or fails to find any. Regarding those results we argue that ST - as a lot of other self-threat concepts - can be interpreted under the scope of the Meaning Maintenance Model (Heine, Proulx, & Vohs, 2006). However, our fail to replicate the classical effect of Diagnosticity on performance in Exp1. (Steele & Aronson, 1995) is a limitation of this interpretation. Indeed, the higher performance observed in participants greeted by a Female experimenter in the Diagnostic condition is consistent because the participants felt more threatened than in the Control condition. Nevertheless, it is less consistent that participants greeted by a Male experimenter did not significantly perform better in the Diagnostic condition. One possible explanation for this result is that the Male experimenter has been perceived by participants as an expert in sewing (Marx & Roman, 2002) - which has lowered the threatening component of the stereotype. It may also be explained by the fact that participants filled the PST scale just after the Diagnosticity induction. In a fluid compensation perspective (Heine, Proulx, & Vohs, 2006; Proulx & Heine, 2009; Proulx, Inzlicht, & Harmon-Jones, 2012), we could argue that participants used this scale to express their fear of the stereotype and thus to reduce it.

Our results confirm that Diagnosticity can be substituted by subtle contextual cues to induce ST (Strack & Deutsch 2004). A particular attention should be given to those cues in studies using PST as a control of ST, as they are needed to observe ST effects in ecological contexts (i.e., without manipulation of Diagnosticity).

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## **Footnotes**

<sup>1</sup>: Number of papers obtained by searching for “stereotype threat” - criteria: everywhere in the text - in Psychinfo database.