In the version of this article initially published, Dr. Menno W. Vos's effort and his co-authorship were not specified. A communication error between the two authors led to Dr. Vos's omission in the manuscript submission and revision process. To correct for this omission, the authors would like to disclose in full their involvement:

Adrian Stanciu (first author) provided his contribution, partially because of his Master thesis requirements, in the processes of idea development, research design development, literature review, data collection and analysis, manuscript drafting and, subsequently, manuscript revision for the publication in *The Journal of Social Psychology*.

Menno W. Vos (second author) provided his contribution, partially because of his role as a Master Thesis Supervisor, in the process of idea development, and literature suggestions, research design development, support in data analysis and support in writing up the research by means of both feedback (e.g. suggestions on structure and argumentation) and active involvement in the writing process itself (e.g. rewriting specific sentences).

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Stereotype-based faultlines and out-group derogation in diverse teams: The moderating roles of task stereotypicality and need for cognition

Adrian Stanciu

Bremen International Graduate School of Social Sciences

ABSTRACT

Alignment of individuals on more than one diversity attribute (i.e., fault-lines) may lead to intergroup biases in teams, disrupting the efficiency expectancies. Research has yet to examine if this can be a consequence of a stereotypical consistency between social and information attributes of diversity. The present study tests the hypothesis that, in a team with a stereotype-based faultline (a stereotypical consistency between gender and skills), there is increased out-group derogation compared to a team with a stereotype-inconsistent faultline. Furthermore, the study proposes that tasks can activate stereotypes, and the need for cognition dictates whether stereotypes are applied. The findings confirm the hypothesis and additionally provide evidence that tasks that activate gender stereotypes emphasize out-group derogation, especially for team members with low need for cognition.

Organizations increasingly rely on teams that are diverse in terms of social category aspects (onwards as social aspects or attributes), such as gender and ethnicity, and in terms of information/decision-making aspects (onwards as information aspects or attributes), such as skills and task-relevant knowledge. Research has shown that, while the latter can boost performance, the former can impede a diverse team's efficiency (e.g. Homan, van Knippenberg, Van Kleef, & De Dreu, 2007a, 2007b). Since both attributes can occur simultaneously within a team, there can be competing predictions as to whether diversity is beneficial or detrimental. In an attempt to clarify this paradox, van Knippenberg, De Dreu, and Homan (2004) proposed the intergroup bias postulate, stating that a social attribute can be disruptive to the potency of an information attribute. According to the postulate, team performance is low under intergroup bias. Nevertheless, to the best of our knowledge, no study has examined whether the nature of the relationship between the two diversity attributes can cause intergroup bias in diverse teams. In the present study, we address this gap from the perspective of diversity faultlines.

A diversity faultline occurs when the characteristics of team members align based on two distinct attributes (Lau & Murnighan, 1998). Given that different social aspects often imply distinct information aspects (cf. van Knippenberg et al., 2004), the composition of a diverse team can align based on mixed social-information aspects. The alignment of these attributes in a stereotypically consistent manner may intensify a team's intergroup biases (Blanz & Aufderheide, 1999). Thus, in this study we test the hypothesis that intergroup bias is higher in a faultline where social and information attributes align in a stereotypically consistent manner in contrast to a stereotypically inconsistent faultline.

CONTACT Adrian Stanciu ✉ stanciu.v.adrian@gmail.com ▢ Bremen International Graduate School of Social Sciences, Jacobs University Bremen, Campus Ring 1, South Hall, Bremen 28759, Germany.

ⓘ Supplemental data for this article can be accessed on the publisher's website.

Task characteristics can influence the outcomes of diverse teams (e.g. Bowers, Pharmer, & Salas, 2000). Tasks that elicit expectations of who should perform them can act as contextual cues for stereotype activation, which has been previously associated with intergroup biases in diverse groups (Wood, 1987). Moreover, given the activation of a stereotype, the degree to which it is applied depends on one's available cognitive resources to process any external stimuli—one's need for cognition (NFC, Cacioppo, Petty, Feinstein, & Jarvis, 1996). Although there is evidence that NFC is associated with performance in a diverse team (Kearney, Gebert, & Voelpel, 2009), it is yet unclear whether NFC has an impact on intergroup biases in a diverse team. Therefore, in this study, in addition to testing the hypothesis of the stereotype-based faultline, we examine whether the association of faultline-intergroup bias is moderated by a task that is stereotypically consistent with social attributes of a diverse team. Lastly, we examine whether the effects of task stereotypicality is moderated by NFC.

Diversity in teams

Diversity in teams refers to differences among team members on varying social and information attributes (Jehn, Northcraft, & Neale, 1999; Joshi & Roh, 2009; Scheepers, Spears, Doosje, & Manstead, 2006; van Knippenberg et al., 2004). The social perspective states that similarities and differences on demographic aspects, such as gender and ethnicity, represent a basis for group categorizations (Williams & O'Reilly III, 1998). In line with predictions of the social identity and social categorization theories (Abrams & Hogg, 1990; Oakes, Turner, & Haslam, 1991), group categorization is associated with favoritism toward one's in-groups and derogation toward out-groups (Brewer, 1999; Cuddy et al., 2009). Research has shown that, as a result of the dual standards, the degree of social heterogeneity of a team is negatively associated with the team's efficiency (Jehn et al., 1999; for a review see, Van Knippenberg & Schippers, 2007). Contrasting with the social perspective, the information perspective proposes that heterogeneity in teams is an indicator of unique task-relevant abilities. A wider range of pertinent skills and abilities facilitates a thorough processing of task-relevant demands, which in turn has been linked with an increase in efficiency (Bantel & Jackson, 1989; Cox, Lobel, & McLeod, 1991).

The key difference between the two perspectives is that, while social attributes emphasize the nature of social interactions among team members, information attributes highlight the efficiency of a team. The apparent contradicting predictions of the two perspectives have fueled the concern that new and more complex research is needed in order to examine whether diversity is beneficial or detrimental. In an attempt to reconcile this shortcoming, van Knippenberg and colleagues (2004) have suggested that, while information attributes are beneficial to a team's efficiency, social attributes may override this potency via biases occurring in intergroup relations. In other words, intergroup bias, the preference of one's in-group and derogation of out-groups, can disrupt the identification process and the inclusion of different task-relevant skills and abilities. The segmentation into in-groups and out-groups generates barriers in the elaboration of task-relevant information.

Intergroup bias as symbolic out-group derogation

Efficiency of a team is highest during low levels of intergroup bias (cf. Van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007). As a general understanding, intergroup bias represents the manifestation of a tendency to evaluate one's in-groups more favorably at the expense of other groups at the cognitive, affectionate, and behavioral levels (Hewstone, Rubin, & Willis, 2002). This manifestation can take the form of in-group favoritism and/or out-group derogation. On the one hand, the former represents an intrinsic desire to maintain high levels of esteem and coherence of one's identity (Smith & Henry, 1996). Members of in-groups are seen as trustworthy entities that, as a result of sharing similar values (Roccas & Schwartz, 1993), can assist in this process. Noteworthy is that this type of bias does not necessarily imply detrimental relations with out-groups (Brewer, 1999).

On the other hand, the out-group derogation approach to intergroup bias indicates that while in-group favoritism elicits mild reactions, heightened levels of emotion and threat can elicit strong reactions against out-groups (cf. Hewstone et al., 2002). Hewstone and colleagues have pointed out that strong emotions (e.g. anger) are more likely to be associated with out-group derogation in contrast to milder emotions (e.g. disgust).

In fact, recent developments have articulated the link between starkness of an emotional reaction and out-group derogation (Cuddy, Fiske, & Glick, 2007). Generally speaking, although out-group derogation can manifest itself as either passive harm (i.e., acting without) or active harm (i.e., acting against) (Cuddy et al., 2007), the former is more common in the context of diverse teams. An overt and unequal misplacement of team resources contradicts the very notion of a team. Since the ultimate goal of a team is productivity (in a variety of forms), actively harming the dynamic exchange of information among team members is unequivocally sanctioned (Bettenhausen & Murnighan, 1985). Instead, milder forms of out-group derogation may go under the radar and, as a consequence, can passively harm the efficiency of a team. Thus, symbolic forms of out-group derogation (i.e., trait ratings) rather than materialistic forms (i.e., resource allocation) (Scheepers et al., 2006) seem to fit more to the expectancy of the intergroup bias postulate in a diverse team.

Stereotype based faultlines

Faultlines represent hypothetical dividing lines that split a group into relatively homogeneous subgroups based on two diverse attributes (Lau & Murnighan, 1998; Thatcher & Patel, 2011, 2012). For instance, a team composed of two Dutch men and two Romanian women has a faultline on nationality and gender. Research has shown that diverse teams with a faultline composition underperform when compared to diverse and homogeneous teams (Lau & Murnighan, 2005; Pearsall, Ellis, & Evans, 2008; Sawyer, Houlette, & Yeagley, 2006). Contrasting with research that has examined the effects on team efficiency from faultlines that are based on social or information attributes, faultlines based on mixed social-information attributes are underrepresented (for reviews see, Stanciu, 2015; Thatcher & Patel, 2012).

The recent affinity of research to acknowledge both social and information attributes of diversity plays a central role in this study. As an alternative to considering social attributes as moderating the benefits of information attributes on team efficiency, we propose that the efficiency of diverse teams may depend on the nature of the association between the two aspects of diversity following two assumptions. The first is the hierarchical assumption that posits that a social attribute can trigger expectations about the presence of an information attribute (Phillips, 2003; Phillips & Loyd, 2006). The second is the congruent assumption that suggests that similarities on a social attribute can elicit expectations of similarities on an information attribute (Chatman, Polzer, Barsade, & Margaret, 1998). Men can easily be distinguished from women. The mere dissimilarity based on gender can extend expectancies that there are dissimilarities on psychological aspects. Moreover, the mere similarity based on gender provides a cue for similarities based on skills. For example, while men are more likely to perceive themselves as sharing common skills with other men, women are more likely to perceive themselves as sharing common skills with other women. These assumptions are suggestive of a mixed social-information diversity faultline.

In other words, social attributes can elicit stereotypical expectancies regarding information attributes. We suggest that alignment in a stereotypical manner between an information attribute and a social attribute represents a stereotypically consistent faultline. An example of a team with such a stereotypical consistent faultline is one with two men possessing stereotypical male skills (e.g., entrepreneurship) and two women possessing stereotypical female skills (e.g. artistic). In the present paper we expect that, more than a stereotypically inconsistent faultline, a stereotypically consistent faultline will be associated with intergroup bias.

Task stereotypicality as a stereotype activator

Task characteristics can influence the nature of social relations within a diverse team. Tasks that necessitate specific skills can act as contextual cues for stereotype activation (Meyer, Shemla, & Schermuly, 2011). Tasks that are stereotypically feminine can emphasize differences among abilities possessed by women and men in mixed gender teams. For example, the development of an advertisement intended for female audience may elicit cues that distinguish among skills that are stereotypically attributed to women rather than skills that are stereotypically attributed to men. A confirmation of the stereotypical expectation (i.e., women possess stereotypical female skills) will be more potent in triggering stereotypes. In fact, as a study by Casper, Rothermund, and Wentura (2010) suggests, stereotypes are more likely to be triggered when there is a match between a social attribute and context, in contrast to a mismatch between the two. Moreover, there is evidence that a fit among social attributes and context has a stronger influence on one's attitude and behaviors as compared to when they do not match (Blair, 2002; Bukowski, Moya, De Lemus, & Szmajke, 2009). Nevertheless, the question remains as to whether a stereotypical task can moderate the effects of a stereotypically consistent faultline on intergroup bias. Since under this circumstance there will be a dual confirmation of the stereotype expectancy, we hypothesize that intergroup bias will be strongest in this situation.

Need for cognition as a resource in stereotype application

Complementing stereotype activation, research has shown that the actual application of a stereotype in social interactions is a function of (among others) one's NFC (e.g. Carter, Hall, Carney, & Rosip, 2006; Schaller, Boyd, Yohannes, & O'Brien, 1995). Moreover, although studies indicate that NFC is supportive for the elaboration of task-relevant information in diverse teams (Kearney et al., 2009), to our knowledge it is still unclear whether NFC can influence a team's efficiency from the perspective of intergroup bias. As we previously suggested, a likely manifestation of intergroup bias in a diverse team may take the form of symbolic out-group derogation. Since this manifestation in fact pertains to an application of stereotypes, we argue that NFC can determine its potential variation. Members with high NFC will deem stereotypes regarding social attributes as insufficient information in evaluating others and, as a consequence, will likely correct for any perception biases (Sommers & Kassin, 2001). In contrast, we expect that members with low NFC will apply any existing stereotypes with the implicit effect of showing increased levels of intergroup bias (Chaiken, 1980). Thus, in the present study, we test whether NFC explains the effects of a stereotype-based faultline and task stereotypicality on intergroup bias. In short, we hypothesize a three-way interaction among a stereotype-based faultline, task stereotypicality, and NFC.

The present study

Due to the complexity of the study design, we controlled by design a fourth, fifth, and sixth factor—social and information diversity attributes, as well as participant gender. While we indeed examined a mixed social-information faultline, we maintained the diversity attributes constant across study conditions. This allowed us to test whether intergroup bias in a diverse team is associated with the nature of the association between the two attributes of diversity—stereotypically consistent vs. stereotypically inconsistent. Moreover, we examined the hypotheses among female participants only. More details are given below.

Summarizing the study's hypotheses, our first expectation was that participants in a stereotypically consistent faultline would show higher out-group derogation when compared to a stereotypically inconsistent faultline (Hypothesis 1). Furthermore, we hypothesized that a task that matches the stereotypical expectations regarding the participants' gender would intensify levels of out-group derogation in a stereotypically consistent faultline (Hypothesis 2). Lastly, we hypothesized a three-
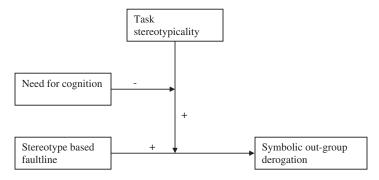
Figure 1. Model depiction of the study hypotheses.

way interaction among the stereotype-based faultline, task stereotypicality, and NFC. In short, we expected that the effects tested in Hypothesis 2 would be stronger among participants with lower levels of NFC (Hypothesis 3). A graphical representation of the tested model can be seen in Figure 1.

Method

Participants and design

Eighty-five female undergraduate students enrolled at a local university (age: $M = 21.65$, $SD = 2.36$) participated in exchange for course credits or monetary compensation (5 Euros). The participants were randomly assigned to one of the study conditions in a 2 (faultline: stereotype consistent vs. stereotype inconsistent) × 2 (task stereotypicality: fragrance vs. football team) between-subjects design. Post-data-collection, we included a third factor as a result of mean split assignment: NFC —high vs. low. Thus, the present study had a 2 (faultline) × 2 (task stereotypicality) × 2 (NFC) between subject design.[1]

Procedure and materials

After arrival at the laboratory, each participant was invited into private cubicles. All participants were given information regarding the supposed nature and setting of the study, namely how brainstorming functions and that they would be working together with three other participants in a brainstorming task. They were then asked for their consent. To create the alleged collaboration for the brainstorming task, we used the software Authorware (version 7.00, Macromedia Inc., 2003) in programing computers to act as three other team members. Although only one real participant was involved in each experimental session, all participants were informed that other participants were either already in their cubicles or were seated in a different part of the laboratory. On the computer, participants could first read the study instructions and then were presented the study manipulations and measures. Each participant received a full debrief at the end of the experiment (for a flow diagram of the study procedure see Appendix A in supplemental material).

Manipulation of stereotype based faultline

In order to manipulate the stereotype consistency of a faultline, we first had to systematically establish the participants' information attributes. In doing so, we used the bogus feedback technique (Homan et al., 2007b). This technique uses a set of 19 items allegedly pertaining to a test of problem-solving style (e.g., I feel that I prefer ideas that are not fully formed). After the participants were told that they are later required to work in teams, they were informed that, in order to find a fitting team

for each participant's skills, it was necessary to identify their problem-solving style. Furthermore, the participants were informed that a computer would automatize the placement. Then, the participants were asked to give their answers to the 19 items on a 7-point scale (1 *strongly disagree* to 7 *strongly agree*). Upon completion of this task, an automated buffer period was shown to indicate that a computer was calculating each participant's problem-solving style. In order to create a sense of realism, the participants were told that, given the lengthy calculation, they could help a fellow colleague "Joanna" in a seemingly unrelated study on diversity and situation handling. By key-stroking "Enter," participants agreed to take part in this study. In fact, among a series of unrelated questions, our measure of NFC was then introduced. Shortly after completion of the "Joanna" study, an automated buffer period was introduced to indicate that the calculation of each participant's problem solving style was being finalized. Next, the results of the bogus problem-solving test were presented as the likelihood of endorsing one of the problem-solving styles, and this was graphically depicted as a dot on a scale ranging from intuitive to logic styles. The participants in the *stereotype consistent* condition could see an "X" followed by "81%" in the vicinity of the intuitive extremity of the scale, and they could read the following:

The results indicate that you are very likely to possess an intuitive problem-solving style.

In contrast, the participants in the *stereotype inconsistent* condition could see an "X" followed by "81%" in the vicinity of the problem solving extremity of the scale, and they could read the following:

The results indicate that you are very likely to possess a logical problem-solving style.

To reinforce the perceived stereotypicality of the test results, all participants were presented with an excerpt from a fictional report stating that 82% of women have an intuitive problem-solving style, and 79% of men have a logical problem-solving style. Immediately thereafter, we addressed the manipulation check regarding gender typicality.[2]

The second step in manipulating the stereotype consistency of a faultline was to emphasize the links between gender and problem-solving style. The participants were told that, given the completion of the assessment of problem-solving style, teams could now be established. An automated buffer period was presented to indicate that each participant's computer had to connect to an alleged network of three other computers. Upon completion of this stage, in both conditions, participants were informed that their group was composed of two women and two men, and that there were two members with each type of problem-solving style. In the *stereotype consistent* condition, participants were informed that all female members had an intuitive problem-solving style and that all male members had a logical problem-solving style. In contrast, in the *stereotype inconsistent* condition, participants were informed that all female members had a logical problem-solving style and that all male members had an intuitive problem-solving style. A visual depiction of each type of team was maintained throughout the brainstorming task (see Appendix B).

Manipulation of task stereotypicality

After the participants were informed about their team composition, they were invited to greet the alleged other team members, and in doing so they familiarized themselves with the brainstorming task procedure. Upon completion, the participants were presented with the requirements of the task, and subsequently they were presented with instructions: answers are given by one team member at a time, each member is allowed to indicate as many answers as possible, answers should be unique, and the task lasts 5 minutes. De facto, here we introduced our manipulation of task stereotypicality using text and a picture (see Appendix C). Participants in the *fragrance* condition were shown a picture of a fragrance bottle, and they could read:

The nature of this task was chosen randomly from a sample of possible tasks. The task represents a brainstorming session on coming up with possible names for a fragrance. Below, to give you an idea about the nature of the fragrance, we present you an image of it. [*placement of image*]. Therefore, how would you name a fragrance with such characteristics? Please write down as many ideas as you may have. There are no right or wrong answers. This is just a brainstorming task.

Participants in the *football team* condition were shown a picture with a team logo and could read the same text as participants in the fragrance condition, but the words that are underlined were exchanged with: football team, team, the logo, and football team (for a print screen that illustrate the tasks see Appendix D).[3,4]

When the time limit was reached, an automated buffer screen was introduced to indicate that each participant's computer was disconnected from the network of computers. Then, the participants were asked to answer a set of questions about the following: manipulation check on gender stereotypicality of tasks, symbolic out-group derogation, and manipulation check on degree of believability of both the results of the bogus personality test and the brainstorming task. Finally, the participants were thanked for the participation, fully debriefed, and asked about their preferred type of reward.

Measures

Manipulation checks

For each manipulation, two types of single-item measures were used: one measuring the gender typicality and another measuring how believable the manipulation was in the study context. Gender typicality was evaluated on a 7-point scale and had as anchors: 1 *typical male* and 7 *typical female* (for the task manipulation "typical" was exchanged with "characteristic"). An example item is: "When you think back to your result of the BSCM test [n.b. bogus problem solving style] you could say it is…" Degree of believability was evaluated on a 7-point scale and had as anchors: 1 *unbelievable in the context of a study* and 7 *believable in the context of a study*. An example is: "When you think back to the task that you had to perform you could say it is…"

Need for cognition (NFC)

The need for cognition was measured using the 18 items of the "Need for Cognition Scale" (Cacioppo, Petty, & Kao, 1984). All items were assessed on a 7-point scale (1 = *extremely uncharacteristic of me*; 7 = *extremely characteristic of me*). Examples of items were: "I prefer complex to simple problems" and "I usually end up deliberating about issues even when they do not affect me personally."

Symbolic out-group derogation

Symbolic out-group derogation was measured using the three items of the "Symbolic Out-group Derogation Scale" (Scheepers et al., 2006). Specifically, the participants were informed to consider their collaboration with the team members with an opposite problem-solving style. Subsequently, they were asked about their agreement on the following aspects: born to be losers, little chances to find a solution, and difficulties in succeeding. All items were assessed on a 100-point scale with one-point increments and with anchors 1 *not at all* and 100 *very much*. An item example is: "Those who have a logical [n.b. intuitive] problem-solving style have very little chances to find a solution to a given problem."

Results

Manipulation checks

Gender stereotypicality

As intended, participants perceived the intuitive problem-solving style as female stereotypical and the logical problem solving style as male stereotypical, $t(83) = 18.42$, $p < .001$, $d = 4.02$. Participants in the stereotype-consistent condition perceived their assigned bogus personality style as more female stereotypical compared to participants in the stereotype-inconsistent condition (stereotype-consistent, $M = 6.18$, $SD = 0.88$ vs. stereotype inconsistent, $M = 2.19$, $SD = 1.11$). Furthermore,

according to the condition to which they were assigned, participants distinguished between a stereotypically female task and a stereotypically male task, $t(83) = 10.14$, $p < .001$, $d = 2.20$. Participants in the fragrance condition perceived the task as more female stereotypical than participants in the football team condition (fragrance, $M = 5.58$, $SD = 1.10$ vs. football team, $M = 2.95$, $SD = 1.36$).

Degree of believability in the context of a study

Participants perceived the estimation of their solving style as equally believable in the study context, $t(83) = 0.34$, $p = .73$, $d = 0.07$ (stereotype consistent, $M = 4.63$, $SD = 1.53$ vs. stereotype inconsistent, $M = 4.52$, $SD = 1.27$). Likewise, participants perceived the tasks as equally believable in the study context, $t(83) = -1.18$, $p = .24$, $d = -0.25$ (fragrance, $M = 3.93$, $SD = 1.58$ vs. football team, $M = 4.33$, $SD = 1.57$).

Main analysis

Means, standard deviations, and scale reliabilities are presented in Table 1.

Main effect of stereotype based faultline

To examine Hypothesis 1, we estimated an independent t-test between mean levels of out-group derogation in the stereotype-consistent and -inconsistent faultlines. In line with our expectation, participants in the stereotype-consistent condition showed more out-group derogation when compared to participants in the stereotype-inconsistent condition, one tailed test: $t(83) = 1.67$, $p = .05$, $d = 0.36$, $M_{\text{stereotype consistent}} = 22.81$ ($SD = 17.19$), $M_{\text{stereotype inconsistent}} = 17.35$ ($SD = 12.65$).

Moderating effects of task stereotypicality and NFC

To examine Hypotheses 2 and 3, we regressed each participant's level of out-group derogation on the main effects of faultline, task stereotypicality, and need for cognition, and on their interaction coefficients. All main effects were introduced collectively in a first step, all first-order interactions in a second step, and the second order interaction in a third step. Faultline and task stereotypicality were dummy coded, and need for cognition was mean-centered. The results of the hierarchical regression are summarized in Table 2.

Evidence for Hypothesis 2 was revealed in the second step of the hierarchical regression. The interaction effect between stereotype-based faultline and task stereotypicality was significant, $b = .37$, $t(74) = 2.87$, $p = .005$. Simple effect analyses revealed that, in line with our predictions, participants in the stereotype-consistent condition showed more out-group derogation if they were in the fragrance condition compared to the football team condition, $F(1,81) = 4.06$, $p < .05$, $\eta^2 = .05$. Furthermore, participants in the stereotype consistent condition showed more out-group derogation compared to participants in the stereotype-inconsistent condition, who also shared membership in the fragrance condition, $F(1,81) = 8.28$, $p < .05$, $\eta^2 = .09$. Table 3 displays the means and standard deviations for these differences.

Table 1. Means, scale reliabilities, and inter-correlations among study variables.

	M	SD	α	1	2	3	4
1. Stereotype based faultline	–	–	–	–			
2. Task stereotypicality	–	–	–	.01	–		
3. NFC	4.60	0.77	.88	.17^p	.16^p	–	
4. Symbolic out-group derogation	64.40	20.11	.83	.18*	.05	−.08	–

Note. Stereotype based faultine: 1 = Stereotype consistent, 0 = Stereotype inconsistent. Task stereotypicality: 1 = Stereotypical female, 0 = Stereotypical male. NFC = need for cognition. Correlations are in italics: r for 3^4, Point biserial for 1^3, 1^4, 2^3, 2^4, Phi for 1^2. Tests are one-tailed; ^{p} significant at $p = .10$; * significant at $p < .05$.

Table 2. Symbolic out-group derogation as a function of faultline, task stereotypicality, and NFC.

		Symbolic out-group derogation	
Predictor		ΔR^2	b
Step 1		.65**	
	Faultline		.17[p]
	Task stereotypicality		.06
	NFC		−.08
Step 2		.05**	
	Faultline		−.08
	Task stereotypicality		−.19
	Need for cognition		.07
	Faultline × Task stereotypicality		.37**
	Faultline × NFC		.01
	Task stereotypicality × NFC		−.24**
Step 3		.02[p]	
	Faultline		−.06
	Task stereotypicality		−.16
	NFC		−.03
	Faultline × Task stereotypicality		.37**
	Faultline × NFC		.16
	Task stereotypicality × NFC		−.08
	Faultline × Task stereotypicality × NFC		−.23[p]
Total R^2		.72	
n		85	

Note. b = standardized values; NFC = need for cognition; [p] significant at $p < .10$; * significant at $p < .05$; ** significant at $p < .01$.

Table 3. Symbolic out-group derogation as a function of faultline and task stereotypicality.

	Task stereotypicality	
	Fragrance	Football
Stereotype consistent	27.25[a][c]	18.17[b]
Faultline	(3.15)	(3.22)
Stereotype inconsistent	14.28[d]	20.42
Faultline	(3.22)	3.22

Note. Means in the same row/column that do not share the same superscript/subscript are significant at $p < .05$; SDs are in brackets.

Evidence for Hypothesis 3 was indicated in the third step of the regression. The two-way interaction between task stereotypicality and NFC was qualified by a marginally significant three-way interaction with NFC, three-way interaction: $b = −.23$, $t(74) = −1.88$, $p = .065$. To facilitate the understanding of the effects of the three-way interaction on out-group derogation, we investigated the 2-way interaction effects of task stereotypicality × NFC separately for the stereotype-consistent and -inconsistent conditions. We compared participants low in NFC (−1 SD) and participants high in NFC (+1 SD). The results showed that in the stereotype-inconsistent condition, task stereotypicality was not associated with out-group derogation neither for low NFC, $b = −1.68$, $t(74) < 1$, nor for high NFC participants, $b = −10.04$, $t(74) = −1.25$, $p = .21$. In the stereotype-consistent faultline condition, task stereotypicality had a positive effect on out-group derogation for low NFC participants, $b = 32.26$, $t(74) = 4.13$, $p < .01$, but it was not related to out-group derogation for high NFC participants, $b = −7.24$, $t(74) = −1.11$, $p = .26$. Figure 2 depicts these patterns.[5]

Discussion

Stereotype consistent attributes and team efficiency

A new perspective on the effects of diversity in teams can be indicated by the study's main finding that a stereotypically consistent faultline is associated with out-group derogation. Although past research has
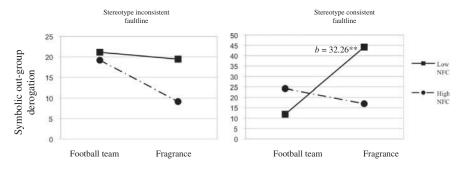
Figure 2. Symbolic out-group derogation as a function of faultline, task stereotypicality, and NFC (± 1 *SD*).

experimentally controlled the information attribute (Homan et al., 2007a, 2007b), the present study was among the first to control this attribute as part of a diversity faultline. The study provides initial evidence that relations among team members may be influenced by *how* social and information attributes of diversity are related. This can be a consequence of convergent identities (cf. Roccas & Brewer, 2002). Identities may be completely embedded (e.g. all women are sensitive), some identities may be orthogonal (e.g. all men are sensitive), and some identities may overlap only moderately (e.g. empathetic men). When multiple identities are embedded, as is the case in our stereotype-consistent condition, the process of categorization after one identity can extend to the second identity (Brewer & Pierce, 2005). In a sense, a stereotypical convergence between two distinct diversity attributes facilitates memory retrieval and the application of stereotypes (Blanz & Aufderheide, 1999). In other words, the comparative and normative fit of a social category increases and, as a consequence, the effects of the social attribute are emphasized (cf. van Knippenberg et al., 2004).

While the study focused on intergroup bias as a dependent variable, the results also have an implication for a team's efficiency. As we pointed out in the review of literature, there is a link between levels of intergroup bias and the efficiency of a diverse team. A strong intergroup bias is disruptive to a team's performance (cf. van Knippenberg et al., 2004). The present approach to the study of intergroup bias, namely from a diversity faultline perspective, can extend to predictions of efficiency of a team with a stereotype-based faultline. As a speculation, one can expect that a team with a stereotype consistent faultline will underperform compared to a team with a stereotype inconsistent faultline.

Scenarios to avoid in diverse teams

Since a team's structural composition (for instance, stereotype consistency between social and information attributes) can influence the team's degree of intergroup bias and implicitly its level of performance, we examined what can circumvent the negative effects of the team's structural composition. Our findings show that tasks play a detrimental role. Specifically, tasks that elicit evident expectancies regarding who should perform them are more likely to disrupt the benefits of a team's diversity (Hypothesis 2). In our experimental setting, we found that female participants in the stereotypically consistent faultline show more out-group derogation when they are required to perform a female stereotypical task compared to when they are asked to perform a male stereotypical task (see simple effect of stereotypically consistent faultline, Table 3). This corroborates with Meyer and colleagues' (2011) indication that task characteristics can emphasize certain identities. On the one hand, being required to perform a task that evidently puts certain team members at an advantage can cause fringes along the team's faultline structure; this validates the already-formed in-group on social and information attributes. On the other hand, being required to perform a task that evidently blurs the team's faultline structure can invalidate the in-group based on social and information attributes.

Another scenario can occur. Since some organizations practice a specific set of tasks, and as such it is unlikely for them to modify their offer, it was necessary to examine what possibilities are available to overcome the stereotypical expectancies of a task. The findings reveal that tasks that elicit stereotypical female skills are associated with lower out-group derogation in a team that has a stereotypical inconsistent faultline (see simple effect of fragrance, Table 3). When mental schemes do not clearly differentiate among team members, there is no reason for a task to disrupt the teams' functioning (Bukowski et al., 2009). As a result, and depending on whether a team's faultline is validated or invalidated, the task itself can represent a subtle leverage point that organizations can use to harvest the benefits of diversity. An organization that correctly distributes tasks among team members may be more efficient than organizations that fail to consider the influence of a task's stereotypicality.

Noteworthy is that the study showed the highest level of out-group derogation for participants who endorsed low NFC and no difference for participants high in NFC (Hypothesis 3). In the stereotype-consistent condition, participants low in NFC showed more out-group derogation when asked to perform a stereotypical female task compared to a stereotypical male task. This is an indication of what scenario is least desirable in diverse teams. The need for cognition is innate to every person, and as such it is unrealistic to create teams accordingly. However, it seems more realistic that managers become aware of the composition of their teams. In cases where team members possess a low desire for cognitive effort, a manager may find it helpful to promote a superordinate identity (Rico, Sánchez-Manzanares, Antino, & Lau, 2012). In doing so, the attention shifts from faultline identity to the overarching identity.

Limitations and future research

A number of limitations should be considered in interpreting these results. Although the study was successful in proposing a novel methodology for assessing a stereotype-based faultline, the validity and reliability of this methodology, acknowledging here our manipulation checks, are yet to be fully examined (Aronson, 1990). Furthermore, some sample-related aspects narrow the findings' generalizability. First, due to budgetary concerns, the study design was restricted to an investigation of female participants. While there is evidence to support our hypotheses, we can only speculate that this evidence is also applicable to male participants. Gender studies indicate that there can be differences in the way men and women react to the social environment (Feingold, 1994), a variation that could be interesting to examine in the context of the present study. Second, due to pragmatic reasons, the hypotheses were studied among a sample of undergraduate students. While this is common practice in psychological research, a recent debate has emerged as to whether findings based on such samples can be generalized to an overall population (Henrich, Heine, & Norenzayan, 2010). One way to address these issues is to explore the reproducibility of these findings (Nosek, Spies, & Motyl, 2012). Replication studies could seek to account for these shortcomings by testing the present hypotheses with samples of male participants and non-undergraduate participants.[6]

The overall study was guided by the implicit assumption that, conceptually speaking, intergroup bias precedes performance. In attempting to systematically control for confounding variables, we also had to disregard by design a number of other relevant variables. Perhaps the most concerning limitation in this approach is that our assessment of out-group derogation did not capture intergroup relations per se; rather it captured a real participant's reaction to pre-programmed software. Although the findings support the postulate of the minimal group paradigm (Tajfel, 1970), it is unclear whether *actual* interactions among participants would have had a different outcome. Especially in the context of team diversity, it is recommended that future research address this issue. As it is, the findings provide speculative predictions on how a stereotype-based faultline is associated with a team's efficiency (van Knippenberg et al., 2004). Whether actual interactions among members of a team with a stereotype-based faultline will elicit intergroup biases remains to be examined further. In addition, and central to the debate of diversity benefits, a next step would be to complement the actual findings with measures of team performance. A complex design in

which intergroup bias mediates the relationship between a stereotype-based faultline and team efficiency can bring valuable insights to the mechanisms that occur in diverse teams.

Lastly, post-hoc power analysis revealed that the study was efficient in detecting a true significant effect of the three-way interaction only at a level of 58%. While the interaction approached significance at $p = .065$, it failed to achieve a value below $p = .05$. Given the present effect size ($f^2 = .06$), to achieve a power of $1\text{-}\beta = .80$ in detecting true significance, we acknowledge that a sample of $N = 136$ could have been more adequate (Soper, 2015). Although the direction of significance was in the hypothesized direction, a further rigorous testing is recommended in order to systematically validate the present findings (Stangor & Lemay, 2016).

Conclusion

The present research constitutes one of the first attempts to show that stereotype-based faultlines (convergence in a stereotype-consistent way between information and social diversity attributes) can lead to intergroup biases within diverse teams. Assessed as the level of out-group derogation, it was shown that tasks that activate stereotypes as well as whether team members have low levels of cognitive thinking could lead to such biases.

Notes

1. The initial sample was $N = 89$ female participants. During the debriefing, four indicated that they were aware that they did not collaborate with other participants. Their data was discarded from main analyses.
2. In a pilot study, 20 female undergraduate students indicated *intuitive problem-solving style* to be more female specific than *logical problem-solving style*, $F(1,19) = 3.27$, $p = .04$, one sided test, $\eta^2 = .08$. Vice versa holds for *logical problem solving style*, where participants indicated to be more male specific than *intuitive problem-solving style*. All participants indicated that both scenarios were equally believable in a study context.
3. Twenty undergraduate students (14 female and 6 male) were asked to evaluate four different scenarios on a gender-characteristic measure and task-difficulty measure. Out of the four scenarios, the dyad of scenarios football team and fragrance showed clear differences. Participants indicated that the fragrance scenario was more female characteristic than the football team scenario, $F(1,19) = 110$, $p < .001$, one sided test, $\eta^2 = .81$, and that they would rather assign a female to the fragrance scenario than a male, $F(1,19) = 33.05$, $p < .001$, one sided test, $\eta^2 = .56$. In addition, no differences in task difficulty emerged, $F(1,19) = .02$, $p < .44$, one sided test, $\eta^2 = .001$.
4. We coded the participants' answers with the intention to assess performance and creativity. However, we did not find consistent effects, and as such they were discarded from further analyses.
5. The post-hoc power analysis for hierarchical regression had the following value for the three-way interaction: At Cohen's $f^2 = .06$, $\alpha = .05$, $N = 85$, power of the statistical test was $1\text{-}\beta = .58$ (Soper, 2015). The statistical test was underpowered to detect a true significant result (Cohen, Cohen, West, & Aiken, 2003).
6. Upon request, the author can provide the interested researcher with the program that was used for data collection.

Notes on contributor

Adrian Stanciu conducted the present research to fulfill the requirements of his Master's degree thesis at the University of Groningen, the Netherlands. Now, he is writing his doctoral thesis on "The Accommodation of Migrants' Personal Stereotypes to Cultural Stereotypes in Host Societies" at the Bremen International Graduate School of Social Sciences.

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