When diversity leads to closed-mindedness: Cognitive factors explain the effects of perceived diversity

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Abstract

This paper makes a case for explaining diversity effects through cognitive factors as compared to demographic or other differences in backgrounds. We argue that studying perceived diversity in conjunction with diversity beliefs can explain positive and negative effects through a motivated opening or closing of the mind (Need for Cognitive Closure, NFCC). NFCC is the motivation to avoid uncertainty and ambiguity. In Study 1, we experimentally demonstrate that asking participants to think about differences among their coworkers increases their NFCC. Study 2 shows that greater uncertainty about social norms in the workplace is positively related to NFCC. Study 3 confirms the mediating role of NFCC in explaining divergent thinking attitudes in expatriates working in various multicultural cities around the world. Study 4 demonstrates that perceived diversity is positively associated with NFCC when people hold negative beliefs about diversity, whereas positive beliefs mitigate this effect. Lastly, Study 5 shows that the interaction between perceived diversity and diversity beliefs is further moderated by task type. Taken together, the present research highlights the importance of studying cognitive factors to explain diversity effects.

Keywords Perceived diversity · Diversity beliefs · Need for cognitive closure · Diversity effects

> "The question is not what you look at, but what you see"
> –Henry David Thoreau (1851)

Diversity has typically been defined as "the distribution of differences among the members of a unit with respect to a common attribute X, such as tenure, ethnicity, conscientiousness, task

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attitude, or pay" (Harrison & Klein, 2007, p. 1200). Decades of research on diversity in organizations had yielded positive as well as negative results (van Knippenberg & Schippers, 2007; Williams & O'Reilly, 1998) —a phenomenon also known as the "paradox of diversity" (Bassett-Jones, 2005). On the one hand, diversity has the potential to increase organizations' competitiveness by promoting innovation and problem solving (e.g., Bantel & Jackson, 1989; Hoffman & Maier, 1961; McLeod, Lobel, & Cox, 1996; McLeod & Lobel, 1992). On the other hand, diversity is related to greater turnover, resulting in loss of competitiveness (Jackson et al., 1991; Sacco & Schmitt, 2005; Wagner, Pfeffer, & O'Reilly, 1984). Given the increasingly diverse workforce in organizations (The National Center for Public Policy and Higher Education, 2005), it is paramount for managers to understand under which conditions specifically diversity leads to positive or negative results. To explain the paradox of diversity, previous research has looked at moderating factors such as task characteristics (e.g., Jehn, Northcraft, & Neale, 1999) or different types of diversity (Harrison, Price, & Bell, 1998).

Previous research has distinguished between surface and deep-level diversity (van Knippenberg & Schippers, 2007; Williams & O'Reilly, 1998). Whereas surface-level diversity

refers to differences in demographic (visible) characteristics such as age, gender, or race, deep-level diversity describes differences in team members' attitudes, values, or personalities, which have to be inferred from interactions and behaviors (Harrison et al., 1998). Typically, surface-level diversity has been found to have little impact on team outcomes (Horwitz & Horwitz, 2007; Jackson et al., 1991). In comparison, deep-level diversity such as differences in personality traits like conscientiousness are often job-related, and hence, can impact team performance. Likewise, diversity in team members' values have been associated with decreased team performance (Jehn & Mannix, 2001). Horwitz and Horwitz (2007) found that task-related diversity (e.g., differences in education) promoted teams' effectiveness, whereas bio-demographic diversity was unrelated to team performance.

The different types of diversity could not be reliably linked to positive and negative effects (for a review see van Knippenberg & Schippers, 2007). More recently, researchers have shifted their attention from examining objective diversity to studying individuals' perception of diversity (e.g., Harrison, Price, Gavin, & Florey, 2002; Hentschel, Shemla, Wegge, & Kearney, 2013; Unzueta & Binning, 2012; Unzueta, Knowles, & Ho, 2012) and people's beliefs about diversity (Van Dick, van Knippenberg, Haegele, Guillaume, & Brodbeck, 2008). After all, (objective) diversity should only exert influence on employees when they actually perceive dissimilarity (Härtel & Fujimoto, 2000). Perceived diversity has been linked to predominantly negative outcomes such as less team identification and more relationship conflict (Hentschel et al., 2013). However, it depends on how open employees are toward dissimilarity and what their beliefs about diversity are (Chattopadhyay, 2003; Härtel, Douthitt, Härtel & Douthitt, 1999; Härtel & Fujimoto, 2000; Fujimoto, Härtel, & Härtel, 2004; van Dick et al., 2008; van Knippenberg, Haslam, & Platow, 2007). When employees believe in the value of working with diverse others, diversity leads to positive outcomes such as those related to group identification (van Knippenberg et al., 2007) or greater performance (Homan, van Knippenberg, Van Kleef, & De Dreu, 2007). However, it is still unclear through which psychological mechanism these effects occur and the present research seeks to shed light on this question.

In this paper, we propose the *Need for Cognitive Closure* (NFCC, Kruglanski, 1989, 2004) as a cognitive mechanism explaining how perceived diversity can lead to positive and negative diversity outcomes. NFCC has been defined as the "desire for a firm answer to a question and an aversion toward ambiguity" (Kruglanski & Webster, 1996, p. 264). It is the motivation to obtain stable, firm knowledge in order to avoid uncertainty and ambiguity (see Berenbaum, Bredemeier & Thompson, 2008; Webster & Kruglanski, 1994). NFCC consists of a preference for order, predictability, decisiveness, an aversion for ambiguity, and closed-mindedness. Importantly,

NFCC is related to outcomes predicted by both the *social categorization* as well as the *information and decision-making perspective*. Social identity theory (Tajfel, 1978; Tajfel & Turner, 1986) predicts negative effects of diversity given that individuals strive to maintain a positive self-concept through their social identity. Individuals like and want to interact with people whom they perceive to be similar to themselves (Byrne's, 1971). Thus, interpersonal conflicts are expected between team members who are dissimilar, which should impact performance negatively (Pelled, Eisenhardt, & Xin, 1999). On the other hand, models for information and decision-making in teams (e.g., De Dreu, 2006) predict a positive impact of diversity on performance. Given that diversity entails that more information and perspectives are available during discussions, more creative outcomes and better decisions can be obtained.

As we elucidate in the following sections, perceived diversity can be linked to either a motivated opening or closing of the mind (NFCC, Kruglanski & Webster, 1996). Generally, people's reasoning is influenced by their motivation, although their degree of awareness about it varies (Kunda, 1990). Still, whether people open or close their minds in the face of perceived dissimilarity, depends on their beliefs about diversity (van Dick et al., 2008; van Knippenberg, De Dreu, & Homan, 2004). The suggested mechanism would explain how diversity beliefs exert their influence in organizations and why diversity can be related to positive and negative outcomes. Previous research has only studied these phenomena on a group-level (e.g., Fujimoto et al., 2004). In the present paper, we take an individual-level perspective to investigate the cognitive reactions to diversity.

Cognitive Factors in Diversity Effects

Perceived diversity is defined as the degree to which individuals are aware that others differ along any salient dimension (Shemla, Meyer, Greer, & Jehn, 2016) and can be quite different from "actual" diversity. For instance, perceived diversity is a construct that has been found subject to motivational influences (Homan, Greer, Jehn, & Koning, 2010; Unzueta et al., 2012). Ultimately, it is individuals' perception of their social environment that guides their behavior (Hobman, Bordia, & Gallois, 2003; Lawrence, 1997) and different diversity characteristics might be more or less salient to different individuals. In support of this analysis, it has been found that perceived diversity has more proximal explanatory power than objective diversity (Harrison et al., 2002; Harrison & Klein, 2007). Perceived diversity, however, is different from how individuals value the perceived differences (i.e., *diversity beliefs*; van Dick et al., 2008).

Diversity beliefs describe the opinion that people hold regarding whether working with dissimilar others is beneficial

and desirable, or not (e.g., van Dick et al., 2008). Diversity beliefs have been found to moderate various findings in the diversity literature (van Knippenberg et al., 2007). For instance, team members' favorable beliefs toward diversity for achieving the team's goals have been found to positively moderate the relationship between subjective diversity and team identification (van Dick et al., 2008). Furthermore, diversity beliefs were found to moderate the relationship between diversity and performance, such that informationally-diverse groups performed better when team members believed in the value of diversity (Homan et al., 2007). Since most research on perceived diversity found negative effects (Harrison et al., 2002; Liao, Chuang, & Joshi, 2008; Zellmer-Bruhn et al., 2008), it is a small step to assume that people predominantly hold unfavorable beliefs about diversity. However, positive diversity beliefs unlock the potential that lies in working with diverse others —or at least mitigate the negative consequences that could be observed otherwise.

In this paper, we propose a cognitive mechanism that can be linked to both the positive and negative effects of diversity. We theorize that, when confronted with diverse others, individuals open or close their minds depending on their beliefs about diversity (Kooij-de Bode, van Knippenberg, & van Ginkel, 2008; Mackie, Worth, & Asuncion, 1990; Turner et al., 1987; see van Knippenberg, 1999; van Knippenberg & van Ginkel, 2010). Similar others provide greater affordance of consensual shared reality, whereas groups of dissimilar others can create uncertainty (Kruglanski, Shah, Pierro, & Mannetti, 2002). In the workplace, this can mean being uncertain about social norms and how to behave. In general, given that people strive to reduce uncertainty (Berger & Calabrese, 1975; Hackett & Hogg, 2014; Kagan, 1972), they tend to identify with groups that are clearly defined and whose members agree on shared attributes (e.g., Hogg, Sherman, Dierselhuis, Maitner, & Moffitt, 2007). Thus, dissimilar others pose greater uncertainty, which would lead to a closing of the mind.

A motivated opening or closing of the mind in response to perceived diversity can be represented by the Need for Cognitive Closure (NFCC, Kruglanski, 1989, 2004). Although NFCC can be conceptualized as a personality trait, it is also a psychological mindset that varies with situational demands (Roets, Kruglanski, Kossowska, Pierro, & Hong, 2015; Roets, Van Hiel, Cornelis, & Soetens, 2008; Webster & Kruglanski, 1994). For instance, NFCC can be manipulated through time pressure, noise, fear of invalidity, or task attractiveness (Heaton & Kruglanski, 1991; Kruglanski & Freund, 1983; Roets at el., 2008; Webster, 1993). Importantly, NFCC has been shown of great relevance for various organizationally relevant outcomes, such as creativity or resistance to innovation (e.g., Chernikova, Kruglanski, Giovannini, Vezzali, & Su, 2017; Chirumbolo, Livi, Mannetti, Pierro, & Kruglanksi, 2004; Pierro, Kruglanski, & Raven, 2012).

We propose that a motivated opening vs. closing of the mind –dependent on individuals' diversity beliefs– explains positive and negative diversity effects (e.g., creativity, communication, team identification, information elaboration, or performance). In other words, depending on how people evaluate diversity, its impact can either turn into open-mindedness or into closed-mindedness. Negative diversity beliefs should lead to a motivated closing of the mind, whereas positive diversity beliefs would lead to open-mindedness. NFCC as an explanatory mechanism has several advantages. So far, the literature has conceptualized and tested mediators on a group-level such as information elaboration, task conflict, or team communication (Homan, van Knippenberg, Van Kleef, & De Dreu, 2007; van Knippenberg & Schippers, 2007; Homan et al., 2017; Kearney & Gebert, 2009). However, a single cognitive mechanism at the individual-level can explain both positive and negative diversity effects. Most importantly, individuals' NFCC has the potential to explain diversity effects related to interpersonal categorization (e.g., team identification, team liking, and relationship conflict) as well as diversity effects related to information and decision-making processes (information elaboration, more creative solutions, and performance increases).

Lastly, we propose that the interactive effect between diversity beliefs and perceived diversity on NFCC should be more pronounced for complex tasks vs. routine tasks (task type; Campbell, 1988). In other words, we hypothesize that the relationship between perceived diversity and NFCC can be mitigated for employees holding positive diversity beliefs and working on complex tasks. Positive diversity beliefs are expected to prevent a closing of the mind, which should be especially beneficial for creativity and other tasks that require sustained cognitive effort. For routine tasks, however, employees abide by stricter standard operating procedures, which do not necessitate much creativity (Gladstein, 1984). In this context, it is more likely that a plurality of perspectives and opinions would hinder efficient task fulfillment and lead to interpersonal and task conflicts –independent of diversity beliefs. In contrast, diversity has the potential to increase task performance when tasks are complex and different perspectives are not only beneficial, but often necessary (see Triandis, Hall, & Ewen, 1965). Thus, when confronted with diverse others, people who believe in the beneficial impact of diversity may stay open-minded and motivated to use diverse informational resources (e.g., Scholten, van Knippenberg, Nijstad, & De Dreu, 2007). However, we expect a motivated closing of the mind for people who believe that diversity is more of a hindrance, which should result in more conflict. In line with this reasoning, Horman and colleagues found that diversity beliefs play a role in intellectual, but not physical tasks (Homan et al., 2010). Other researchers found that diversity is positively related to performance, but only for complex tasks (Higgs, Plewnia, & Ploch, 2005; Wegge, Roth,

Neubach, Schmidt, & Kanfer, 2008). Likewise, Bowers, Pharmer, and Salas (2000) argued that heterogeneous groups might outperform homogenous groups for high-difficulty tasks, but not for low-difficulty tasks. We set out to test our ideas in the context of another often studied moderator, that is, task complexity. Thereby, we aim to show the mediating role of NFCC on organizational relevant outcomes. Here, we chose task and relationship conflict as dependent variable not only because of their organizational relevance for performance (e.g. Pelled, Eisenhardt, & Xin, 1999), but also because of their ability to capture both interpersonal categorization (relationship conflict) as well as information and decision-making processes (task conflict). Taken together, we posit and test the following hypothesis:

Hypothesis 1: Perceived diversity increases NFCC.
Hypothesis 2: The effect of perceived diversity on NFCC can be explained by greater uncertainty.
Hypothesis 3: Perceived diversity is positively associated with NFCC, which in turn predicts outcomes relevant to organizations such as potential for creativity.
Hypothesis 4: Perceived diversity is positively related to NFCC for individuals with low (vs. high) positive diversity beliefs.
Hypothesis 5: The interaction between perceived diversity and diversity beliefs is further moderated by task type. We expect a buffering effect of positive diversity beliefs on NFCC for complex (vs. routine) tasks under conditions of perceived diversity. Moreover, NFCC is hypothesized to mediate the effect on task conflict and relationship conflict.

The Present Research

In the present paper, we investigate the effect of perceived diversity on organizational outcomes and examine if this relationship is mediated by NFCC. Study 1 experimentally manipulates perceived diversity to provide causal evidence for the hypothesized effect of perceived diversity on NFCC. Study 2 investigates the underlying mechanism explaining the relationship between perceived diversity and NFCC, namely, uncertainty about social norms in the workplace. In Study 3, we test our proposed mediation model with expatriates living and working in various multicultural cities around the world. Specifically, we examine whether the relationship between perceived diversity and potential for creativity can be explained by NFCC. Lastly, we tested the moderating role of diversity beliefs on our proposed mediator in Study 4. Study 5 further tests whether the interaction between perceived

diversity and diversity beliefs is moderated by task type (complex vs. routine task). Specifically, we examine the hypothesis that diversity beliefs moderate the relationship between perceived diversity and NFCC, especially for complex (vs. routine) task. In turn, we expect NFCC to mediate the relationship between the independent variables and the dependent variable (task and relationship conflict). Data were collected in a manner consistent with current APA Ethical Principles. Participants were told that the purpose of the studies was to examine the psychological experience (i.e., thoughts, beliefs, and emotions) of diversity at the workplace and gave informed consent.

Study 1

Study 1 investigated the hypothesized relationship between diversity and NFCC experimentally. Specifically, we test the hypothesis that perceived diversity can increase individuals' NFCC.

Method

Participants and Design

This online experiment featured two between-subject conditions (control vs. diversity priming). Using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007), we estimated the required sample size for this online study to be 260 participants with 80% power and small to medium effect size. The final sample comprised 268 (148 women, 120 men; M_{age} = 34.84, SD_{age} = 10.06) employees recruited via MTurk. The participants were part- or full-time employees in various sectors including retail, management, finances, business, education, health care and social assistance, government, or agriculture.

Procedure and Materials

After obtaining informed consent, participants were randomly assigned to one of the two experimental conditions. Participants who were assigned to the diversity priming condition were asked to think about how their coworkers are different from one another and to describe these differences. In the control condition, participants were asked to think about why they take MTurk HITs and to describe these reasons (we chose this control condition instead of asking participants to think about similarities between their coworkers because we surmised that a similarity manipulation would as well render differences more salient). We measured perceived diversity as well as participants' NFCC.

Measures

Perceived Diversity We asked employees to indicate the extent to which they thought their coworkers were different from each other on the following dimensions: educational background, nationality, ethnic background, gender, age, seniority, values, skills, knowledge, attitudes toward work, learning goals, marital status, family status, individuals' salary, way of thinking, team tenure, organizational tenure, race, problem-solving strategies, and job experience (1 = *strongly disagree*, 7 = *strongly agree*). Since the answers were highly correlated (α = .91), we formed an average score for each individual.

Need for Cognitive Closure We used Roets and Hiel's (2011) 15-item scale (α = .86) to assess participants level of NFCC in an index score. Sample items include "When I have made a decision, I feel relieved" and "I dislike it when a person's statement could mean many different things" (1 = *strongly disagree*, 7 = *strongly agree*).

Results and Discussion

First, we performed a manipulation check to test whether our experimental treatment had the intended effect. As expected, participants in the diversity prime condition (M = 4.76, SD = .99) reported higher perceived diversity than participants in the control condition (M = 4.29, SD = .98; $t(264)$ = 3.88, p < .001). Next, we tested the hypothesis that asking participants to think about differences among their coworkers increases NFCC. In line with our hypotheses, participants in the diversity condition reported greater NFCC (M = 4.44, SD = .90) than participants in the control condition (M = 4.22, SD = .94; $t(266)$ = 1.98, p = .048; d = .24; 95% CI [−.448, −.002]). We display means, standard deviations, and correlations for all measures in Table 1.

In conclusion, experimentally increasing perceived diversity led to a greater NFCC in participants. Thus, we showed that perceived diversity has a causal impact on NFCC. This rules out alternative explanations for correlations between diversity and NFCC, such as that individuals with a high dispositional NFCC merely self-select into more diverse teams. In

our next study, we want to show that being confronted with diverse others is linked to greater uncertainty, which can result in a closing of the mind.

Study 2

In Study 2, we set out to investigate the underlying psychological mechanism between perceived diversity and NFCC. As outlined in the theoretical part of the paper, we hypothesized that employees can feel uncertain regarding how to behave in a diverse workplace, which in turn is related to greater NFCC.

Method

Participants and Design

Study 2 tested a mediation model with perceived diversity as predictor, uncertainty as mediator variable, and NFCC as outcome variable. A sample of 230 people was suggested by 5000 Monte Carlo simulations (Schoemann, Boulton, & Short, 2017) to detect medium sized effects with 80% power. We recruited 232 employees (120 women, 112 men; M_{age} = 39.62, SD_{age} = 10.13) via Mturk online panel services who verified that respondents work part- or full-time in various employment sectors (public sector, nonprofit sector, or private sector).

Procedure and Materials

We assessed employees' perceived diversity in the workplace, their level of uncertainty in regard to social and behavioral norms in the workplace, as well as their NFCC. We also asked for demographic variables such as gender and age.

Measures

Perceived Diversity We included the scale for perceived diversity developed by Hentschel et al. (2013) to measure employees' diversity perceptions in the workplace in a reliable and succinct manner. The scale is comprised of three items (α = .83), such as: "I am aware of the differences among my colleagues" (1 = *strongly disagree*, 7 = *strongly agree*). Additionally, we included the same measure for perceived diversity as in Study 1.

Uncertainty We presented participants with the following eight items (α = .93) to measure their level of uncertainty in regard to social norms in the workplace: "At work, I often don't know which social norms apply," "I often feel uncertain about how to interact with my coworkers," "Sometimes, my coworkers' behaviors are ambiguous to me," "I don't know

Table 1 Means, Standard Deviations, and Correlations Involving Variables from Study 1 (N = 268)

	M	SD	2	3
Exp. Condition (1)	.46	.50	.23**	.12*
Perceived Diversity (2)	4.51	1.01		.15*
Need for Closure (3)	4.32	.93		

Note. ** p < .001; * p < .05

how to best interpret my coworkers' behaviors," "I am very uncertain about the right way to form relationships at work," "At work, I feel uncertain about how to interact with my coworkers," "I am not sure my coworkers always understand me," and "I am not sure how to best talk to my coworkers" (1 = *strongly disagree*, 7 = *strongly agree*).

Need for Cognitive Closure We used the same scale (α = .92) as in Study 1 to measure participants' NFCC.

Results and Discussion

Path analyses were conducted to test the hypothesis that the relationship between perceived diversity and NFCC would be mediated by the extent to which individuals feel uncertain about social and behavioral norms in the workplace. The model was tested with AMOS (Arbuckle, 2007) using maximum likelihood estimation procedure. Two paths were specified: One path from perceived diversity to uncertainty, and one path from uncertainty to NFCC (see Fig. 1). We display means, standard deviations, and correlations for all measures in Table 2. Results revealed that the hypothesized model had a good fit, χ^2 (*df* = 1, *N* = 232) = .90, *p* = .34, GFI = .99, CFI = 1.00, IFI = 1.00, RMSEA = .00, AIC = 10.90, SRMR = .02.

Perceived diversity predicted greater uncertainty about social norms in the workplace (*B* = .30, *p* < .001), which, in turn, was positively associated with NFCC (*B* = .19, *p* < .001). We tested the mediating role of uncertainty between perceived diversity and NFCC by calculating bootstrapped confidence interval estimates of the indirect effect (see Preacher & Hayes, 2008). In the present study, the 95% confidence interval of the indirect effects was obtained with 5000 bootstraps resamples (Preacher & Hayes, 2008). Results confirmed the mediating role of uncertainty between perceived diversity and NFCC (*B* = .06; CI = .03 to .10).[1]

Study 2 demonstrated a mechanism by which perceived diversity is related to NFCC. It seems that when employees are confronted with diverse others, they become more uncertain, for instance about which social norms apply and which behaviors are deemed appropriate. This, in turn, predicts a motivated closing of the mind, that is, higher NFCC. In our

next study, we wanted to show that NFCC is associated with organizational relevant outcome variables.

Study 3

Study 3 investigates downstream consequences of our model on outcome measures of organizational importance. Specifically, we examine whether NFCC mediates the relationship between perceived diversity and employees' potential for creativity, that is, their divergent thinking attitudes. To increase the external validity of our findings, we recruited employees who live and work in diverse environments around the world.

Method

Participants and Design

Study 3 tested a mediation model with perceived diversity as predictor, NFCC as mediator variable, and divergent thinking attitudes as outcome variable. Setting power at 80% (and assuming large effect sizes due to the highly diverse environments the participants live and work in), a sample size of 115 individuals was suggested (Schoemann et al., 2017). We recruited 117 expats (53 women, 64 men; M_{age} = 40.38, SD_{age} = 10.55) via a large international network community for people who live and work abroad and want to further intercultural exchange. Participants work in cities such as Shanghai, Sydney, Dubai, Los Angeles, Beijing, Singapore, London, New York, and Paris.
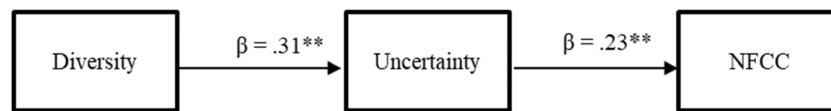
Procedure and Materials

We measured employees' perceived diversity in the workplace, their NFCC, as well as their attitudes toward divergent thinking.

Measures

Perceived Diversity We used the same three-item (α = .72) scale as in Study 2.

Need for Cognitive Closure We used the same scale (α = .89) as in Study 1 and 2 to measure participants' NFCC.

Divergent Thinking Divergent thinking attitudes serve as a measure for the potential for creativity (Basadur & Hausdorf, 1996). We used Basadur and Finkbeiner's (1985) "Tendency for premature critical evaluation of ideas" scale (α = .79) that uses eight items to measure divergent thinking attitudes related to organizational creativity (Basadur & Hausdorf, 1996). For example, we asked participants to

Table 2 Means, Standard Deviations, and Correlations Involving Variables from Study 2 (N = 232)

	M	*SD*	2	3
Perceived Diversity (1)	4.05	1.46	.31**	.13*
Uncertainty (2)	2.60	1.38		.23**
Need for Closure (3)	4.52	1.13		

Note. ** *p* < .001; * *p* < .05

Fig. 1 Indirect effect of Perceived Diversity on Need for Cognitive Closure (NFCC) via Uncertainty (Study 2). *Note.* ** $p < .001$

indicate the extent to which they agreed with statements such as: "I wish people would think about whether or not an idea is practical before they open their mouth" as well as "You need to be able to recognize and eliminate wild ideas during idea generation" (1 = *strongly disagree*, 7 = *strongly agree*). Higher scores on this scale indicate lower divergent thinking attitudes.

Results and Discussion

Path analyses were conducted to test the hypothesis that the relationship between perceived diversity and divergent thinking attitudes would be mediated by NFCC. The model was tested with AMOS (Arbuckle, 2007) using maximum likelihood estimation procedure. Two paths were specified: One path from perceived diversity to NFCC, and one path from NFCC to the divergent thinking attitudes (see Fig. 2). We display means, standard deviations, and correlations for these measures in Table 3. Results revealed that the hypothesized model fit the data well, χ^2 ($df = 1, N = 117$) = 2.14, $p = .14$, GFI = .99, CFI = .98, IFI = .98, RMSEA = .09, AIC = 12.14, SRMR = .04.

Perceived diversity predicted individuals' NFCC ($B = .25$, $p < .001$), which, in turn, was positively related to their divergent thinking attitudes, that is, their tendency for premature critical evaluation of ideas ($\beta = .54$, $p < .001$). Indirect effects were investigated to further test the mediating role of NFCC between perceived diversity and divergent thinking. Consequently, bootstrapped confidence interval estimates of the indirect effect (see Preacher & Hayes, 2008) were calculated to confirm the significance of mediation. In the present study, the 95% confidence interval of the indirect effects was obtained with 5000 bootstraps resamples (Preacher & Hayes, 2008). Results confirmed the mediating role of NFCC between perceived diversity and divergent thinking ($B = .13$; CI = .05 to .24).

Study 3 confirmed our model in the context of expatriates living and working in diverse settings around the world, thereby adding to the external validity our research. Most importantly, we demonstrated the predictive power of our model in regard to divergent thinking attitudes related to organizational creativity. Divergent thinking is crucial for creative thinking and problem solving (e.g., Guilford, 1967). Hence, it is extremely important for organizations to understand antecedents of divergent thinking to be able to create conditions under which they can stay competitive in increasingly diverse work environments. However, it remains the question how the findings of this study reconcile with other findings that show that diversity increases creativity (e.g., Chirumbolo et al., 2004; see also Gocłowska, Crisp, Labuschagne, 2013; Goclowska, Ritter, & Hanel, in press)? Although perceived diversity seems to be predominantly related to negative effects, another cognitive factor was identified as an important moderator: diversity beliefs.

Study 4

In Study 4, we tested the proposed mechanism NFCC in the context of diversity beliefs as a moderator. Specifically, we expect that individuals with negative diversity beliefs would show increased NFCC under conditions of high perceived diversity, whereas this effect should be mitigated by positive beliefs about diversity. Thus, positive diversity beliefs should function as a buffer and hinder the adverse effect of perceived diversity on NFCC. Thereby, our proposed mechanism could provide an explanation for how diversity beliefs lead to the different findings in the diversity literature.

Method

Participants and Design

Study 4 tested the moderating role of diversity beliefs for the relationship between perceived diversity as predictor and NFCC as outcome variable. Using G*Power (Faul et al., 2007), we estimated the required minimum sample size for this study to be 222 participants with 80% power and a small effect size ($f^2 = .05$). The final sample was comprised of 222 (136 women, 86 men; $M_{age} = 19.80$, $SD_{age} = 1.81$) students who live and study together in a highly diverse international university setting.

Table 3 Means, Standard Deviations, and Correlations Involving Variables from Study 3 (N = 117)

	M	*SD*	2	3
Perceived Diversity (1)	3.85	1.41	.30*	.27*
Need for Closure (2)	4.07	1.15		.55**
Divergent Thinking (3)	4.32	1.12		

Note. ** $p < .001$; * $p < .05$

Fig. 2 Indirect effect of Perceived Diversity on Divergent thinking attitudes (Tendency for premature critical evaluation of ideas) via Need for Cognitive Closure (NFCC) in Study 3. *Note*. ** $p < .001$

Procedure and Materials

We assessed perceived diversity, NFCC, as well as beliefs about diversity. Additionally, we asked students to indicate their age and gender.

Measures

Perceived Diversity We adapted the same three items ($\alpha = .60$) used in Studies 2 and 3 to measure how much difference students perceived among their fellow students.

Diversity Beliefs Akin to previous research (e.g., Hentschel et al., 2013; van Dick et al., 2008), we used three items ($\alpha = .77$) to assess students' general beliefs about working in a diverse setting. For example, we asked students to indicate the extent to which they agreed with statements such as "Teams perform better when they include people who are different from one another" (1 = *strongly disagree*, 7 = *strongly agree*). Higher scores indicate more favorable beliefs about diversity.

Need for Cognitive Closure We used the same scale ($\alpha = .84$) as in Studies 1, 2, and 3 to measure participants' NFCC.

Results and Discussion

We conducted hierarchical multiple regression analyses to examine simple as well as interaction effects of perceived diversity and diversity beliefs on NFCC. We display means, standard deviations, and correlations for all measures in Table 4. According to Aiken and West's (1991) procedures, independent variables were standardized before calculating the interaction terms. We entered perceived diversity and diversity beliefs in Step 1 of the regression model as well as the corresponding two-way interaction in Step 2. Step 1 explained a significant amount of variance in NFCC, $F(2, 219) = 7.38$, $p = .001$, $R^2 = .06$. Results showed that although diversity beliefs were not significantly related to NFCC ($B = -.05$ CI [$-.18, .08$], $p > .41$), perceived diversity was ($B = .25$ CI [$.12, .37$], $p < .001$). We added the two-way interaction term in Step 2. Diversity beliefs were not significantly related to NFCC ($B = -.02$ CI [$-.15, .12$], $p > .79$), whereas perceived diversity was ($B = .24$ CI [$.11, .37$], $p < .001$). Adding the two-way interaction ($B = -.15$ CI [$-.28, -.02$]) increased explained variance significantly, $F(1, 218) = 5.23$, $p = .023$, $\Delta R^2 = .02$, $R^2 = .09$ (see Table 5).

To further probe the nature of the interaction, we computed the conditional effect of the Perceived Diversity × Diversity Beliefs interaction for low vs. high levels of diversity beliefs (Hayes, 2013). The effect of perceived diversity on NFCC was significant for low levels (1 *SD* below the mean) of diversity beliefs ($B = .36$, 95% CI [$.19, .52$], $t(222) = 4.25$, $p < .001$) but not for high levels (1 *SD* above the mean) of diversity beliefs ($B = .08$, 95% CI [$-.08, .24$], $t(222) = 1.03$, $p > .30$, see Fig. 3). Thus, we could confirm that perceived diversity is associated with NFCC when individuals hold more unfavorable beliefs about diversity. In contrast, when people value diversity, the adverse relationship between perceived diversity and NFCC is mitigated. Accordingly, Study 4 not only attests to the role of NFCC in diversity effects but also provides an explanation for how diversity beliefs exert their moderating function. The findings are also of relevance for organizations that invest in diversity trainings in an effort to increase the value that employees see in diversity. Therefore, it seems worthwhile to identify the specific work or task conditions for which diversity beliefs show their positive impact.

Study 5

In Study 5, we tested whether the influence of diversity beliefs on NFCC would be more important for complex vs. routine tasks. As outlined earlier, complex tasks allow for a possible positive impact of diversity, whereas diversity is more likely to be considered a hindrance for tasks for which standard procedures are at play. In turn, we expected NFCC to be associated with two organizationally relevant outcomes, namely, task and relationship conflict.

Table 4 Means, Standard Deviations, and Correlations Involving Variables *from Study 4 (N = 222)*

	M	*SD*	2	3
Diversity (1)	5.07	1.10	−.01	.25**
Diversity beliefs (2)	4.60	1.15		−.06
Need for Closure (3)	4.09	.88		

Note. ** $p < .001$

Table 5 Results of Hierarchical Multiple Regression Predicting Need for Cognitive Closure from Perceived Diversity and Diversity Beliefs in Study 4 ($N = 222$)

	F	R^2	ΔR^2	Diversity	Diversity Beliefs	Diversity x Diversity Beliefs
Step 1	7.38*	.06	.06	.25	−.05	–
Step 2	5.23*	.09	.02	.24	−.02	−.15*

Note. * $p < .05$, unstandardized Betas are reported

Method

Participants and Design

The design of Study 5 featured a predictor variable (perceived diversity), two moderating variables (diversity beliefs and task type), a mediating variable (NFCC), and an outcome variable (conflict). A minimum sample size of 425 participants was suggested to detect small to medium effects with 80% power (Schoemann et al., 2017). The final sample was comprised of 449 (235 women, 214 men; $M_{age} = 38.23$, $SD_{age} = 11.93$) employees working part- or full-time in a team setting in various employment sectors (public sector, nonprofit sector, or private sector) who were recruited through MTurk.

Procedure and Materials

We assessed perceived diversity, beliefs about diversity, the type of task employees were working on most of the time (level of complexity/routineness), their level of NFCC, as well as how much task and relationship conflict they experience.

Measures

Perceived Diversity We used the same three items ($\alpha = .76$) as before.

Diversity Beliefs We used the same items ($\alpha = .90$) as in Study 4.
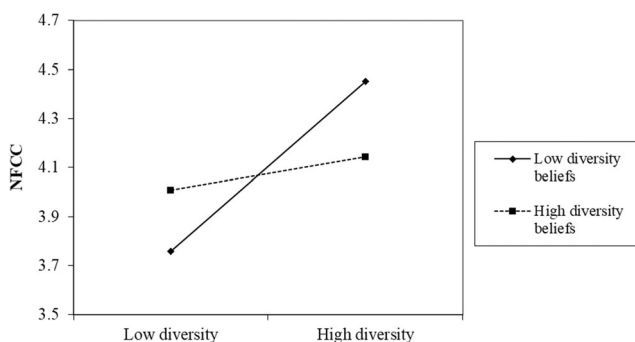
Fig. 3 Need for Cognitive Closure (NFCC) under conditions of low vs. high perceived diversity for low vs. high diversity beliefs (Study 4). *Note*: High = One standard-deviation higher than the mean; Low = One standard-deviation lower than the mean

Task Type We used 20 items ($\alpha = .85$) adopted from Jehn (1995) to assess level of task routineness (e.g. "The methods I follow in my work are about the same for dealing with all types of work, regardless of the activity" (1 = *strongly disagree*, 7 = *strongly agree*).

Need for Cognitive Closure We used the same scale ($\alpha = .90$) as before to measure participants' NFCC.

Conflict We measured task ($\alpha = .91$) and relationship ($\alpha = .94$) conflict, each measured with four items taken from Jehn (1995). Task conflict was measured using the following four items: "How frequently are there conflicts about ideas in your work unit?", "How much conflict about the work you do is there in your work unit?", "To what extent are there differences of opinion in your work unit?", and "How often do people in your work unit disagree about opinions regarding the work being done?". Relationship conflict was measured using the following items: "How much friction is there among members in your work unit?", "How much are personality conflicts evident in your work unit?", "How much tension is there among members in your work unit?", and "How much emotional conflict is there among members in your work unit?"

Results and Discussion

Path analyses were conducted to test the combined predictiveness of perceived diversity, diversity beliefs, and task routineness for conflict through NFCC. The model was tested with AMOS (Arbuckle, 2007) using maximum likelihood estimation procedure. Nine paths were specified (see Fig. 4). We display means, standard deviations, and correlations for these measures in Table 6. Results revealed that the hypothesized model fit the data well, χ^2 ($df = 6$, $N = 449$) = 5.06, $p = .54$, GFI = .99, CFI = 1.00, IFI = 1.00, RMSEA = .00, AIC = 83.07, SRMR = .01. We conducted hierarchical multiple regression analyses to examine the a-path of our model, that is, the simple as well as interactive effects of perceived diversity, diversity beliefs, and task routineness on NFCC. According to Aiken and West's (1991) procedures, independent variables were standardized before calculating the interaction terms. We entered perceived diversity, diversity beliefs, and task routineness in Step 1 of the regression model as well as the corresponding two-way interaction terms

Table 6 Means, Standard Deviations, and Correlations Involving Variables from Study 5

	M	SD	2	3	4	5
Perceived Diversity (1)	4.02	1.35	.24**	.09	.28**	.44**
Diversity Beliefs (2)	4.67	1.34		−.10	−.02	.11*
Task Routineness (3)	4.02	.81			.39**	.11*
Cognitive Closure (4)	4.46	1.04				.23**
Conflict (5)	2.97	1.34				

Note. ** $p < .001$, * $p < .05$

in Step 2 and the three-way interaction term in Step 3. Step 1 explained a significant amount of variance in NFCC, $F(3, 445) = 40.88$, $p < .001$, $R^2 = .22$. Perceived diversity ($B = .27$ CI [.18, .36], $p < .001$) and task routineness ($B = .38$ CI [.29, .46], $p < .001$) were predictive of NFCC; whereas diversity beliefs ($B = −.05$ CI [−.14, .04], $p > .27$) was not. The addition of the two-way interaction terms in Step 2 did not increase explained variance significantly, $F(3, 442) = .92$, $p > .43$, $\Delta R^2 = .01$, $R^2 = .22$. Only perceived diversity ($B = .27$ CI -.19, .37, $p < .001$) and task routineness ($B = .39$ CI [.29, .47], $p < .001$) were predictive of NFCC; all other $ps >$ .20. Most importantly, the addition of the three-way interaction term ($B = .09$ CI [.02, .17]) in Step 3 increased explained variance significantly $F(1, 441) = 6.25$, $p = .013$, $\Delta R^2 = .01$, $R^2 = .23$ (see Table 7).

Results indicated that the interaction between perceived diversity and task routineness on NFCC was significant for positive diversity beliefs (1 *SD* above the mean; $B = .12$, $F(1, 441) = 4.50$; $p = .034$) but not for negative diversity beliefs (1 *SD* below the means; $B = −.07$, $F(1, 441) = 1.31$; $p > .25$; see Fig. 5). We additionally probed the three-way interaction by performing slope difference tests (Dawson & Richter, 2006). Slope (2) for high diversity beliefs/low task routineness was significantly different from Slope (4) for low diversity beliefs/low task routineness ($p = .005$), confirming our hypothesis that positive diversity beliefs mitigate the otherwise negative impact of perceived diversity on NFCC for complex tasks. Moreover, Slope (2) was significantly different from Slope (1) for high diversity beliefs/high task routineness ($p = .033$); all other $ps >$ .19. Indirect effects were investigated

to further test the b-path, that is, the mediating role of NFCC. We used a composite score for conflict ($\alpha = .96$) since the results for task and relationship conflict turned out not to differ. Bootstrapped confidence interval estimates of the indirect effect (see Preacher & Hayes, 2008) were calculated to confirm the significance of mediation. In the present study, the 95% confidence interval of the indirect effects was obtained with 5000 bootstraps resamples (Preacher & Hayes, 2008). Results confirmed the mediating role of NFCC on conflict ($B = .01$; CI = .001 to .043)[2].

Taken together, these findings confirm the moderating role of diversity beliefs when employees work together with diverse others on complex tasks. These results fit well with those of Study 4, since the student participants arguable work on more complex tasks. Moreover, results of Study 5 show that organizations can benefit from giving diversity trainings to improve diversity beliefs especially for employees who work on complex tasks such as those related to idea generation or strategizing. Lastly, we confirmed the hypothesized role of NFCC as a cognitive mechanism explaining diversity outcomes such as task and relationship conflict at work. Overall, these results demonstrate the importance of considering cognitive factors when explaining or predicting effects of diversity.

General Discussion

In five studies, we showed the importance of cognitive factors in explaining the effect of diversity in organizations. In Study 1, we found causal evidence for the effect of perceived diversity on NFCC. In Study 2, we demonstrated how perceived diversity can increase employees' NFCC. Specifically, we found that perceived diversity is positively associated with uncertainty in the workplace, which in turn is positively associated with NFCC. Study 3 replicated our model with expatriate employees working in various multicultural cities around the world. We showed that perceived diversity was associated with greater NFCC, which in turn predicted attitudes toward divergent thinking —an important antecedent of creativity. Furthermore, in Study 4, diversity beliefs moderated the relationship between perceived diversity and NFCC. Perceived diversity was only associated with greater NFCC

Table 7 Results of Hierarchical Multiple Regression Predicting Need for Cognitive Closure from Perceived diversity (PDiv), Diversity beliefs (DivB) as well as Task Routineness (TRout) in Study 5 (N = 449).

	F	R^2	ΔR^2	PDiv	DivB	TRout	PDiv x DivB	PDiv x TRout	DivB x TRout	PDiv x DivB x TRout
Step 1	40.88**	.22	.22	.27**	−.05	.38**				
Step 2	.92	.22	.01	.27**	−.06	.39**	−.04	.04	.04	
Step 3	6.25*	.23	.01	.28**	−.08	.37**	−.06	.02	.07	.09*

Note. * $p < .05$, ** $p < .001$; unstandardized Betas are reported

Fig. 4 Indirect effect of Need for Cognitive Closure (NFCC) on conflict under conditions of low vs. high perceived diversity for low vs. high diversity beliefs and low vs. high task routineness (Study 5). *Note*: High = One standard-deviation higher than the mean; Low = One standard-deviation lower than the mean
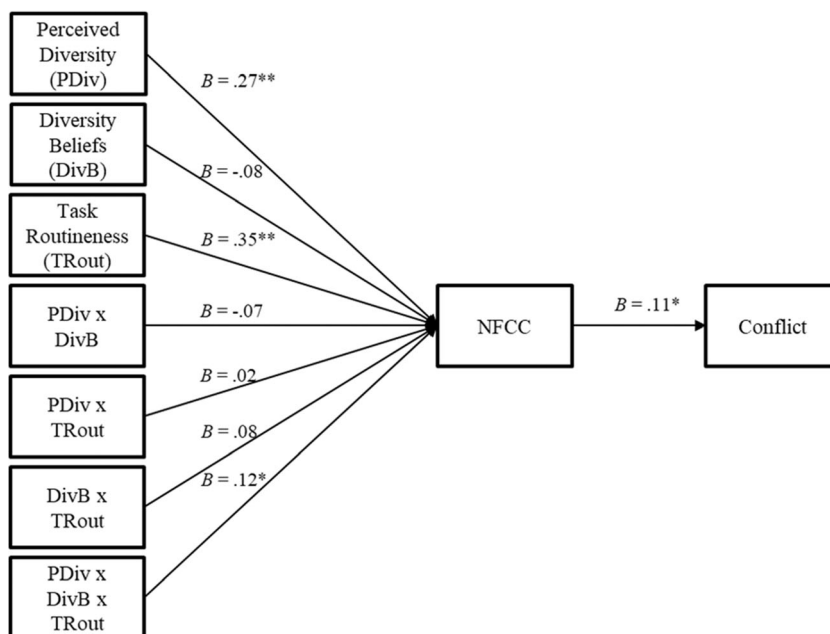
when individuals held more negative beliefs about diversity, whereas positive beliefs about diversity buffered the adverse effect of perceived diversity on NFCC. Lastly, Study 5 shed light on the specific task conditions under which diversity beliefs show their influence: diversity beliefs moderated the relationship between perceived diversity and NFCC for employees working on complex tasks but not for employees working on routine tasks. As expected, NFCC predicted task and relationship conflict[3].

Theoretical Implications

The present work makes several contributions to a better understanding of the role of cognitive factors in diversity effects. Our research can explain the predominantly negative effects

Fig. 5 Need for Cognitive Closure (NFCC) under conditions of low vs. high perceived diversity for low vs. high diversity beliefs and low vs. high task routineness (Study 5). *Note*: High = One standard-deviation higher than the mean; Low = One standard-deviation lower than the mean

of perceived diversity that have been documented in the literature. We showed that perceived diversity is associated with a closing of the mind (NFCC), which can be attributed to the uncertainty that individuals feel when confronted with dissimilar others. However, positive beliefs about diversity moderate the relationship between perceived diversity and NFCC. When employees believe in the positive value of working with diverse others, the adverse effects of perceived diversity on NFCC were mitigated. Since we identified NFCC as a single cognitive mechanism that can potentially explain both positive and negative diversity effects, the proposed mechanism of closing or opening the mind is parsimonious and able to explain the mixed findings in the diversity literature.

Importantly, NFCC is a mechanism related to both social identity/categorization as well as information/decision-making processes –two lines of research previously integrated by the categorization-elaboration model (CEM, van Knippenberg, de Dreu, & Homan, 2004; van Knippenberg & Ginkel, 2010). The CEM proposes that intergroup bias can interrupt the in-depth processing of task relevant information and perspectives, which consequently impairs performance. However, the relationship between intergroup bias and information elaboration is unclear. Here, we propose a mechanism for *how* information elaboration can be impaired in the case of intergroup bias. Perceived diversity impacts NFCC, which can be understood as an opening or closing of the mind. Thus, NFCC is a mechanism that is related to and can potentially explain both social categorization and information processing outcomes. We suggest for future research to include and study NFCC as a motivational and cognitive mechanism to explain diversity effects, especially given NFCC's relevance to important downstream consequences
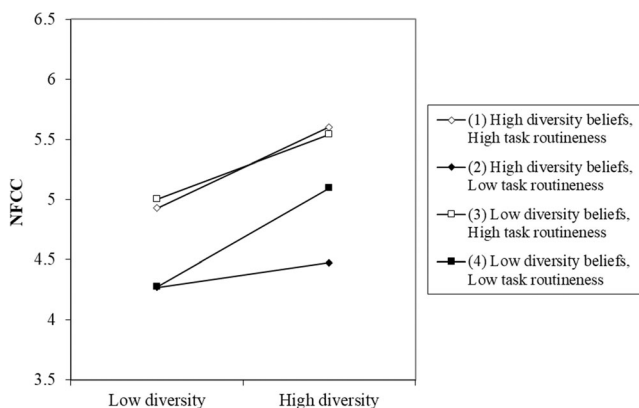
such as employees' well-being, receptiveness to innovation, creativity, as well as preference for soft vs. harsh leadership tactics (e.g., Bélanger, Pierro, & Kruglanski, 2015; Chernikova et al., 2017; Chirumbolo et al., 2004; Iannello, Mottini, Tirelli, Riva, & Antonietti, 2017; Pierro et al., 2012).

Lastly, we confirmed that positive beliefs about diversity are beneficial in the context of employees working on complex (vs. routine) tasks, mitigating the otherwise adverse relationship between perceived diversity and team and relationship conflict. Complex tasks allow for more beneficial impact of diversity due to diverse perspectives and ideas (e.g., van Knippenberg & van Ginkel, 2010), whereas the same might be seen more as a hindrance when it comes to executing routines. However, future studies should test the assumed relationships experimentally to establish causal evidence and rule out self-selection effects as alternative explanations.

Future research should employ behavioral outcome measures and could also test the notion of task interdependence – the extent to which employees feel dependent upon one another to perform their individual tasks (e.g., Van de Ven, Delbecq, & Koenig, 1976) –as an additional moderator. Since high task interdependence goes along with higher contact frequency and the necessity for good team work, diversity beliefs should play an even more important role. A better understanding of the specific conditions under which diversity leads to desired outcomes as well as identifying areas where interventions are needed and fruitful is not only important for theoretical advancement, but also an important practical endeavor for organizations.

Practical Implications

Our findings bear important practical implications for organizations. Initiatives involving diversity trainings have become an increasingly large part of organizations' diversity management and inclusion practices. But what should those trainings focus on to successfully mitigate negative effects of diversity and unleash the positive potential that lies in a diverse workforce? Our findings suggest that diversity trainings should aim at decreasing the uncertainty that comes with being confronted with diverse others and increasing the value that employees see in diversity (cf. Phillips & Lount, 2007), while a focus should be set on employees working on complex tasks.

We found that perceived diversity is associated with greater uncertainty about how to interpret the behaviors of dissimilar others and how to behave around them. Given its relationship to NFCC, decreasing uncertainty about others in the work place can hopefully be a first step to prevent or mitigate a motivated closing of the mind. This, in turn, can positively impact organizational relevant outcomes such as creativity, conflict, and performance. Further, the rationale for increasing the value that employees see in diversity is based on the finding that positive diversity beliefs have a buffering function toward the

adverse effects of perceived diversity on NFCC. Of note, Kulik and Roberson (2008) found that diversity awareness trainings can indeed improve diversity beliefs –a promising finding in light of the importance of individuals' beliefs about diversity.

Our findings also suggest that the positive impact of diversity beliefs is strongest for complex tasks. Thus, organizations should focus on increasing diversity beliefs for employees predominantly working on creative tasks that involve idea generation or strategizing. However, employees' diversity beliefs had no impact on NFCC and conflict for employees working routine tasks. Perhaps different interventions are needed, such as team building exercises focused on interpersonal liking to decrease conflict and to increase employee well-being and organizational commitment. Although future research is needed to test our hypothesis about task interdependence, if confirmed, this would speak against interventions such as facilitating goal interdependence (Wageman, 1995) or superordinate goals (Gaertner & Dovidio, 2000) in diverse contexts. Those interventions might be more appropriate for complex tasks and only if employees believe in the positive impact of diversity.

With regard to diversity trainings, the argument is often made that they are not necessary for individuals who already hold positive diversity beliefs, but more so for individuals who hold negative beliefs. However, employees with positive diversity beliefs are mostly the ones who sign up for diversity trainings in organizations, which suggests to make diversity trainings mandatory or incentivize participation (Bell, Connerley, & Cocchiara, 2009; Kulik, Pepper, Roberson, & Parker, 2007). Since the majority of research found negative effects of perceived diversity, it is a small step to assume that a lot of people hold less positive beliefs about diversity. Even participants recruited in Study 3 showed closed-mindedness. However, these are employees who left their home country to work in multicultural cities around the world. Likewise, the students recruited in Study 4 live and study in arguably one of the most diverse university settings in the world[4]. Hence, we can assume that in both cases self-selection processes render a population that embraces diversity or is at least exceptionally well-versed in dealing with diverse others. However, we still find a negative effect of perceived diversity and enough variance in diversity beliefs to confirm their moderating role (which also allowed for a very conservative test of our hypothesis; cf. Homan et al., 2007). Therefore, it seems that even in populations in which individuals should be accustomed to dealing with diverse others and/or in which diversity beliefs should already be quite positive, there is still room for improvement and the necessity for diversity trainings.

Conclusion

The literature on diversity has documented positive as well as negative effects of diversity in organizations. The current

research highlights the importance of studying cognitive factors to better understand diversity effects, which can help reconcile the mixed findings in the literature. We theorized and found that perceived diversity leads to an opening or closing of the mind (NFCC), depending on employees' diversity beliefs. Perceived diversity is associated with a closing of the mind for individuals holding negative diversity beliefs, whereas positive diversity beliefs can buffer this effect. Thus, we identified NFCC as a mechanism through which perceived diversity and diversity beliefs are related to organizationally relevant outcomes such as creativity or task and relationship conflict. Most importantly, NFCC is a mediator that has the potential to explain outcomes related to social categorization as well as information and decision-making processes. Lastly, we found that diversity beliefs moderate the effects of perceived diversity especially for complex vs. routine tasks. These findings have important managerial implications.

Data Availability The datasets generated during and/or analyzed during the current study are available in the OSF repository, https://osf.io/sx9me/

Declarations

Ethics Statement The New York University Abu Dhabi Institutional Review Board had determined that the subject research protocol for all studies is exempt.

Conflict of Interest The authors declare that they have no conflict of interest.

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