

The Performance of Gender Diverse Teams: What Is the Relation between Diversity Attitudes and Degree of Diversity?

Jakob Lauring¹ and Florence Villesèche²

¹Department of Business Administration, Aarhus University, Aarhus, Denmark ²Department of International Economics and Management, Copenhagen Business School, Frederiksberg, Denmark

While gender diversity is slowly becoming an expected characteristic of teams, both academics and practitioners still need to better understand the relation between contextual characteristics and team composition for the performance of gender diverse teams. In this article, we investigate the relationship between diversity attitudes and the performance of gender diverse teams, and further, we show how numerical team gender composition is a key link in this relationship. Based on survey responses from 1,085 academic team leaders, we show that openness to diversity is strongly associated with team performance. We also find a moderating effect of the degree of gender diversity, so that the effect of openness to diversity, as positive team level diversity attitudes, is stronger when team gender composition converges towards numerical balance. These findings bridge critical mass theory and diversity and performance of gender diverse teams.

Keywords: openness to diversity; critical mass theory; gender; diversity; teams; gender distribution; team performance

Introduction

A growing literature is theorizing about the relationship between diversity and performance. Based on the information/decision-making perspective, academic literature has argued for positive effects of diversity on performance (Williams and O'Reilly, 1998). Competitive advantages can be derived from the expected variance of knowledge and perspectives accruing from diversity (Herring, 2009; Stahl et al., 2010a). However, drawing on the similarity-attraction paradigm, other research suggests that diversity can come with trade-offs such as reduced and restrained communication and coordination (van Knippenberg et al., 2004). This research finds that group members holding or perceived to be holding similar values will have more frequent and deeper communication which helps reduce conflicts and increase efficient use of knowledge (Tsui and O'Reilly, 1989; Mitchell et al., 2009).

The effect of similarity on group member interaction has been argued to be particularly strong regarding gender (Thibaut and Kelley, 1959; Graves and Powell, 1995). This strong effect of gender can be explained by identity-based social and structural mechanisms, in particular social categorization (Mehra *et al.*, 1998; Mollica *et al.*, 2003; van Knippenberg *et al.*, 2004). Social categorization takes place when a phenotypical, or visible, diversity such as gender will, for example, lead women to be perceived as a distinct group with distinct traits and values (regardless of whether they actually are distinct).

Yet, meta-analyses across perspectives lead to no conclusive results (see for example Joshi and Roh, 2009), or point to the decisive influence of other factors such as cultural context (Schneid *et al.*, 2015). In consequence, it appears necessary to put restraint on trying to document and explain a main effect of (gender) diversity on team performance (Hobman *et al.*, 2004; van Knippenberg and Schippers, 2007; McKay *et al.*, 2009). Instead, we need to investigate contextual characteristics (Wegge *et al.*, 2008; Joshi and Roh, 2009; Olsen and Martins, 2012).

Moreover, notwithstanding slow progress, teams are progressively becoming diverse, in particular with regard to gender (cf. Dwyer *et al.*, 2003; Muzio and Tomlinson, 2012; Hoogendoorn *et al.*, 2013). Diversity is thus

Correspondence: Florence Villesèche, Department of International Economics and Management, Copenhagen Business School, Copenhagen, Denmark, Tel +45 38 15 42 68. E-mail fv.int@cbs.dk

increasingly a given rather than an option. We therefore contend that it is time to go beyond looking at diversity as an asset vs. a liability, and rather focus on a better understanding of what affects the ability of teams to reap the benefits of diversity to perform. In line with this, we here focus on factors that support positive effects of team diversity (Joshi and Roh, 2009; Rupert *et al.*, 2016). Specifically, we investigate openness to diversity, as well as its joint effect with team gender composition on team performance.

At team level, contextual constructs such as attitudes toward diversity (Joshi and Roh, 2009; Olsen and Martins, 2012) are of particular interest. Attention has been given to how diversity is contextually valued, with streams of research about diversity beliefs (Homan *et al.*, 2007), diversity mindsets (van Knippenberg *et al.*, 2013), or openness to diversity (Lauring and Selmer, 2011). Overall, perceptions can be pivotal to whether or not an organization benefits from diversity (Hobman *et al.*, 2004; McKay *et al.*, 2009). This suggests that attitudes that are open to diversity are key rather than accessory to the performance of diverse teams and should thus be considered as a main influence on it.

Also, existing studies do not specifically look at gender diverse teams when considering the association between openness to diversity and performance. This is of interest, in line with the need to consider distinct diversity attributes separately (van Knippenberg and Schippers, 2007; Schneid *et al.*, 2015), and the fact that gender is a recurring base for social categorization in teams (Thibaut and Kelley, 1959; Graves and Powell, 1995). Relatedly, the first objective of this article is to account for the leading effect of openness to diversity on the performance of gender diverse teams.

Beyond establishing a positive effect of openness to diversity on the performance of gender diverse teams, we here argue that we also need to consider the composition conditions under which openness to diversity will best be leveraged. Critical mass theory proposes that diversity cannot matter if it is only a token (Nielsen and Huse, 2010), and documents a numerical threshold for gender diversity to impact team-related aspects such as decision-making and performance (Kanter, 1977; Torchia *et al.*, 2011; Joecks *et al.*, 2013; Kogut *et al.*, 2014).

In existing literature, there is predominantly a comparison between teams with or without gender diversity Wood *et al.*, 1985; Bowers *et al.*, 2000; Hillman *et al.*, 2007; Dezsö and Ross, 2012; Campbell *et al.*, 2013). Disregarding distribution has, for example, been justified by the fact that in knowledge-intensive teams, women's presence is too low to make the degree of gender diversity a variable of interest (Dezsö and Ross, 2012).

The degree of diversity -taking into account different gender balances - is overall rarely addressed in the literature (see Hoogendoorn *et al.*, 2013; West *et al.*, 2012 for notable exceptions). As work teams in practice have increasingly both sexes represented (cf. Dwyer *et al.*, 2003; Muzio and Tomlinson, 2012; Hoogendoorn *et al.*, 2013), this calls for more attention to such distribution, however. The second objective of this article is thus to consider the degree of team gender diversity, that is, the gender distribution in a given team, as a potential moderator of the relationship between openness to diversity and performance.

In this article, we show the positive effect of openness to diversity on the performance of gender diverse teams and exhibit how varying degrees of team gender diversity increase or decrease the strength of association between favourable diversity attitudes and team performance. Our work thus extends and bridges scholarship on diversity and performance and critical mass theory by jointly considering numerical team gender composition and openness to diversity in relation to team performance. More broadly, this study participates in promoting diversity in management scholarship (Özbilgin, 2014) by looking at how contextual factors matter for the performance of gender diverse teams rather than trying to frame the debate as a for vs. against the diversity issue.

Theoretical background and hypotheses

The role of openness to diversity

Synonymous concepts are found in the literature considering diversity perception in organizational settings. 'Diversity beliefs' have been defined as "members' awareness of difference" (Shemla et al., 2016), and 'pro-diversity beliefs' are believed to be conducive to more thriving diverse teams (De Dreu, 2007). Similarly, 'Diversity attitudes' can be defined as views and feelings about dissimilarities (Fujimoto et al., 2004; Hobman et al., 2004; Gonzalez and DeNisi, 2009; McKay et al., 2009; Shrivastava and Gregory, 2009; Herdman and McMillan-Capehart, 2010). A positive diversity attitude in a group can be conceptualized as a contextual factor that may reduce negative stereotyping and social categorizations (Härtel, 2004; Olsen and Martins, 2012). In line with this, 'Openness to diversity' refers specifically to group members' positive attention to dissimilarities (Härtel, 2004), and thus puts the emphasis on pro-diversity beliefs and attitudes.

Openness to diversity leads to a number of group-level outcomes. It fosters an environment where individuals value and respect the views of demographically dissimilar team members and actively collaborate with them (McKay *et al.*, 2009). They can improve group processes in diverse settings (Sawyer *et al.*, 2005), lead to the development of alternative solutions to problems

(Schweiger *et al.*, 1989; Oosterhof *et al.*, 2009), and also positively impact the group's ability to resist pressures to conform to dominant positions and thereby see new opportunities (Mitchell *et al.*, 2009).

Regarding team performance, Watson *et al.* (1993) found that culturally heterogeneous groups perform better when openness to diversity is high, and Homan *et al.* (2007) found that teams dealing with heterogeneous information show higher performance when pro-diversity beliefs are prevalent. Finally, Fujimoto *et al.* (2004) showed that diverse groups had higher decision effectiveness when displaying positive diversity attitudes. Accordingly, we hypothesize that:

Hypothesis 1. Openness to diversity is positively associated with the performance of gender diverse teams.

Team gender composition and critical mass

The question remains as to how this effect varies depending on team gender composition. As a rare exception, in an experiment with students, Homan *et al.* (2007) find that gender diverse teams with positive diversity beliefs perform better when working with heterogeneous information. In their discussion, they suggest that such results might be even stronger in the field where teams are typically exposed to a large variety of perspectives and information. However, this study does not investigate different gender equilibriums.

This is knotty as existing work suggests that different levels of gender diversity will have different effects. Critical mass theory specifically emphasizes the notion of polarization, that is, degree of gender diversity (Kanter, 1977; Torchia *et al.*, 2011). In her pioneering work, Kanter (1977) outlines four different theoretical equilibriums: uniform groups (no women), skewed groups (up to 20% of 'token' women), tilted groups (20–40% women), and balanced groups (40–60% women). It has been shown in the wider team literature that a higher presence of a minority in a group increases the potential for interaction and thus lowers the chances of out-group effects (Pike and Kuh, 2006).

In more recent work, the concept of critical mass has distinctively been applied in studies taking interest in women on boards of directors. In such a context, it has been suggested that critical mass is attained with three women or more (Konrad *et al.*, 2008). This argument has been conclusively tested with data from Norwegian boards and shows the impact of getting to or beyond this threshold positively impacts firm innovation (Torchia *et al.*, 2011). Specifically, Torchia *et al.* (2011: 299) argue that three women constitute a "consistent minority", compared to having only one or two "tokens" (that would

be unable to positively influence board dynamics or performance outcomes. This is in line with Kanter's prediction (Kanter, 1977). Joecks et al., 2013 similarly find that starting from a critical mass of about 30%, the presence of women on boards has a positive impact on firm performance. On boards of directors, it also lowers exclusionary dynamics (Konrad *et al.*, 2008).

In the broader team literature interested in gender team composition and performance, Hoogendoorn et al. (2013) developed experiments with a sample of diversely composed student teams and conclude that gender balanced teams perform better than male-dominated groups; however, they were not able to assess the effect of female-dominated ones. West et al. (2012) also used experiments with student groups having different degrees of gender diversity, including a significant proportion of female dominated ones; they do not find a main effect of gender diversity on performance, but find that a higher number of women in the team leads to lower evaluations of group effectiveness. Frink et al. (2003) find a curvilinear relationship between organizational gender composition and organizational performance, yet they do not investigate the team level. In addition, having a more gender heterogeneous group, that is, a more balanced composition, appears to lower expected negative effects of having such heterogeneity (Valenti and Rockett, 2008). In order to complement existing work, we thus propose that:

Hypothesis 2. The positive association between openness to diversity and performance is moderated by gender diversity in the way that if gender distribution is more balanced, then the effect of openness is stronger.

Methods

We gained insights into the interrelation between openness to diversity, degree of team gender diversity and team performance through questionnaires sent to 2,171 leaders of academic research teams from the natural sciences. The names and e-mail addresses of academic team leaders were identified using university web pages. Those individuals that were formally described as the head of a research team were included in the database making it a convenience sampling. Eventually, after three reminders, 1,085 exploitable responses were received from academic team leaders in the Nordic countries (Denmark, Sweden, Norway, and Finland) and the Netherlands. We used the Nordic countries because of the equal distribution of male and female team leaders and team members. Moreover, the university websites of the Nordic countries were of a relatively high quality and well-updated allowing us access to the needed information necessary for developing our database. As team leaders, respondents replied to questions about their team; each of the 1,085 observations thus corresponds to a team, which is the level of analysis.

Research teams are an important type of knowledge intensive work groups in which diversity can have an impact, in line with our theoretical framing. Also, academia at large is an industry in which concerns for equality and for the fruitful exploration and exploitation of diversity are clearly present (see for example Van den Brink and Benschop, 2012). It has, for example, been suggested that gender diverse teams produce higher quality science (Campbell et al., 2013). In addition, compared to many other types of knowledge intensive teams, in academia it is possible to find teams with a majority of female staff, although they tend to hold lower hierarchical positions (Catalyst, 2017). Indeed, while progress has been made with respect to gender equality in the labour market, at least in the OECD countries (Dwyer et al., 2003; Muzio and Tomlinson, 2012), imbalance remains a reality, exemplified by the enduring scarcity or even absence of women in certain industries (Metz and Tharenou, 2001; Frink et al., 2003; Goodman et al., 2003), and more particularly in knowledge intensive teams such as top management or boards (Peterson and Philpot, 2007; Terjesen and Singh, 2008; Cook and Glass, 2013). It is thus remarkable to be able to test our hypotheses on a sample of knowledge intensive teams where we find the whole spectrum of degrees of gender diversity.

Modelling

Intra-class correlation coefficients for performance as the outcome variable were below 1% both when considering the nesting of team leaders in nationalities and when considering research institutions. This means that the hierarchical structure of the data is largely unrelated to

the outcome variable and that multilevel modelling is therefore not necessary.

The observations from the survey were modelled in a series of linear regression models that allowed us to test the interaction effect between gender diversity and openness to diversity in relation to performance. Clusterrobust estimation was used to correct standard errors according to the clustering of team leaders by nationality. This procedure adjusts standard errors to reflect the fact that some respondents came from the same country and that this grouping of respondents can cause biased standard error estimates. Explanatory variables and control variables (except the binary gender variable) are unstandardized but centered on the grand mean to ensure meaningful baseline interpretation. The summary statistics in Table 1 are estimated before centering.

Variables

The response variable is team performance. Openness to diversity, gender diversity and the interaction (the product) of these two variables are the base explanatory components needed to test the hypotheses. Team performance and positive diversity attitudes are latent variables modelled as composite scales based on five and three indicator variables respectively. Tables in the appendix give summary statistics (Appendix A) and correlations (Appendix B) for these indicators.

Openness to diversity was measured by a three-item scale adapted from Hobman *et al.*'s (2004) for *openness to value diversity* recently used by Lauring and Selmer (2011) and in an adapted version by Klitmøller and Lauring (2016). Sample item: 'In my team, members make an extra effort to listen to people who hold different work values and/or motivations' (alpha=.68). The response scale used categories ranging from (1) 'strongly disagree' to (7) 'strongly agree'.

Team performance was measured by Black and Porter's (1991) five-item scale including evaluation of the team's

 Table 1 Descriptive statistics and sample correlations^{ab}

Variable	Mean	Std. Dev	Skewness	Kurtosis	Performance	Team size	Age	Tenure	Female	Openness
Performance	5.53	0.73	-0.51	1 41	_					
Team size	11.23	14.14	16.81	403.90	0.07*	_				
Age	51.04	9.27	0.16	0.34	0.01	0.02	-			
Tenure	11.75	8.63	0.92	0.24	0.04	0.00	0.63***	_		
Female	0.24	0.43	1.22	-0.52	0.00	-0.01	-0.09**	-0.10***	-	
Openness	4.08	0.61	-0.11	0.81	0.12***	0.06	0.02	0.01	0.04	_
Gender diversity	27.31	16.67	-0.95	-0.52	0.02	0.10***	0.04	0.06*	0.01	0.02

a

* p < 0.05,

** p < 0.01,

*** p < 0.001.

^b Based on a total of 1,085 observations. Standard error of skewness estimated at 0.07 (all variables listed). Standard error of kurtosis estimated at 0.15 (all variables listed).

general performance level, their ability to get along with others, their punctual task completion, their level of performance quality, and their achievement of organizational objectives (alpha = 0.84). The scale was recently used by Bader *et al.* (2015). Sample item: 'Team members' general performance'. Response categories were: (1) is very good, (4) neutral, (7) is very poor.

To assess the *degree of gender diversity*, we used a measure based on a simple recoding procedure of the gender composition in each academic team. This measure ranges from 0 to 50, where 0 indicates a 0/100 balance (only one gender represented) and 50 indicates a 50/50 balance between genders (25 indicates a 25/75 balance, 10 indicates a 10/90 balance, etc.). This measure is preferred over other diversity measures like the Reynal-Querol polarization index Reynal-Querol (2002) or Blau's index Blau (1977) as in cases with only two groups, the interpretation of a basic linear gender diversity is much more intuitive and relies on simpler assumptions than the above-mentioned diversity indices. Both types of measures were nonetheless tested, and the basic linear gender balance variable showed a slightly better fit to the data.

The reliability of the constructed variables *team* performance, openness to diversity and gender diversity was also tested using CFA, which indicated a good level of fit of the data based on several different decision criteria (SRMR = 0.035, RMSEA = 0.055; 90% CI: 0.045–0.066; p (RMSEA \leq 0.05) = 0.193). This conclusion was further supported by a CFI of 0.971 and a TLI of 0.958 (see Appendix C).

Four variables were included for control purposes: age, tenure and gender of team leaders, as well as team size. *Team size* was used as a control variable as this could be affecting the role of team diversity (Rogelberg and Rummery, 1996). Team size was assessed through a direct question to the respondents: 'How many academic staff members are currently employed in your team?'. Age and tenure simply reflect years of age and the number of years the respondent has been leading his or her team. Gender is a binary variable with 1 indicating that the respondent is female.

Summary statistics for the scales and observed variables, as well as a correlation matrix for these variables, are given in Table 1. The estimates show that the correlation between openness and performance is very small (B = 0.12). This suggests that there is no common method variance affecting these two measurements.

Results

Three competing models were specified in order to test the two hypotheses proposed. Table 2 gives an overview of parameter estimates and fit indices for these three models. Model fit is assessed with the scaled chi-square test, Akaike's information criteria, the sample-size adjusted Bayesian information criteria and the adjusted R^2 for each model.

The first model (I) tests the strength of the direct relationship between team performance and openness to diversity. Holding age, tenure and gender of the team leader as well as team size constant, an increase of 1 on the unstandardized openness to diversity scale is associated with an increase of around 0.142 on the team performance scale. This effect is robust across the three specified models and suggests that there is a clear and openness to diversity in academic teams. The second model (II) tests the direct effect of gender diversity on performance. The results show that there is no significant relationship between gender diversity and performance

Table 2 The effect of gender polarization on performance moderated by openness^a

Model	Ι	II	III
Intercept	5.534 (0.029)***	5.534 (0.029)***	5.532 (0.029)***
Team size	0.004 (0.002)	0.004 (0.002)	0.003 (0.003)
Age	-0.002 (0.003)	-0.002 (0.003)	-0.002 (0.003)
Tenure	0.005 (0.002)*	0.005 (0.002)*	0.005 (0.002)*
Female	0.001 (0.037)	0.001 (0.037)	0.004 (0.038)
Openness	0.142 (0.029)***	0.142 (0.029)***	0.146 (0.031)***
Gender diversity		0.000 (0.001)	0.000 (0.001)
Openness \times gender diversity			0.005 (0.002)**
No. of parameters	7	8	9
Adjusted R ²	0.022	0.022	0.027
N	1085	1085	1085

Linear regressions with performance as response (unstandardized coefficients). Estimates are robust to clustering of team leaders according to their nationality (clustered standard errors in brackets). All predictors except the interaction term, and the binary gender indicator are grand mean centered.

* p < 0.05,

when holding the control variables and the openness variable constant.

The third model (III) directly addresses the question posed in the second hypothesis by introducing the interaction term between openness to diversity and gender diversity. The parameter estimates in Table 2 suggest that the positive effect of openness on performance is moderated by the gender diversity in the academic team. Due to the centering, the baseline estimates consider a situation in a team where the gender diversity is in line with the average gender diversity of the sample (average gender balance = 27.31% female vs. 72.69%male, see Table 1). Here, a one-point increase in openness is associated with an increase of 0.146 on the performance scale.

However, the estimate for the interaction term suggests that this relationship is strengthened by 0.005 for each one-point increase in gender diversity. For teams with a 50/50 composition of males and females (corresponding to a 22.69 point increase in the gender diversity balance relative to the baseline of 27.31), the relationship between openness to diversity and performance increases from 0.146 to 0.261 (since $0.146 + (22.69 \times 0.005) = 0.261$ [without rounding of estimates]). Reversely, when gender diversity drops, the effect of openness on performance is reduced. In teams with a 20/80 gender composition, the relationship between openness and performance is reduced from 0.146 to 0.109 (P = 0.0004). Simple slope testing shows that this primary relationship is rendered insignificant when the gender diversity drops below a 12/88 balance. Therefore, in teams with only one gender represented or where one gender represents less than 12% of the team members (tokens), positive diversity attitudes will not be significantly related to the performance of the team. The coefficient is above 0 at all times, even in the case of a 0/100 gender balance.

Figure 1 is a graphical illustration of the interaction effect between gender diversity and openness to value diversity. The plotted points correspond to negative and



Figure 1 Moderation of the effect of gender diversity on team performance by openness to value diversity

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positive standard deviations from the mean of both the main variable (openness to diversity) and the moderator variable (degree of gender diversity). The two plotlines show that when gender diversity is low (a 10/90 balance, which is just below the region of significance), team performance is little related to the openness of team members. Then, when gender diversity is high (44/56), openness becomes an important predictor of team performance.

The chi-square, Akaike and the adjusted R^2 suggest that this third and last model is the most appropriate description of the observed data. This underlines the importance of looking at openness to diversity and degree of gender diversity as interacting factors in relation to team performance.

Discussion

In this study, we investigated the influence of diversity attitudes on the performance of gender diverse teams and refined this model by testing the moderating effect of degree of gender diversity on this relationship. In accordance with our theoretical expectations, in our data, we found that positive diversity attitudes are correlated with performance, and that such positive diversity attitudes are more effective when team gender diversity is high than when it is low. We hereafter discuss how our findings contribute to the literature on gender diversity and performance as well as to scholarship about critical mass. Finally, we consider limits of our work and future research avenues, as well as practical implications that can be derived from our work.

Diversity and performance: the key importance of openness to diversity.

Our results provide support for the hypothesis that there is a positive relation between openness to diversity and the performance of gender diverse teams. By testing this direct relationship, we complement previous scholarship suggesting that inclusiveness and openness to diversity positively affects team-level outcomes (Fujimoto *et al.*, 2004; Sawyer *et al.*, 2005; Nishii, 2013) and in turn their ability to perform, as has been shown for other diverse teams, such as culturally diverse teams (Watson *et al.*, 1993; Stahl *et al.*, 2010b).

Our findings also illustrate the importance of considering the interaction between different variables to explain the higher or lower performance of diverse teams, rather than trying to account for a main effect of demographic diversity on performance (van Knippenberg and Schippers, 2007). Further, this suggests that the negative team-level outcomes of gender-based social categorization (van Knippenberg *et al.*, 2004) and stereotyping (Jonsen *et al.*, 2013) can be alleviated thanks to openness to diversity.

Team composition and critical mass

By showing that the effect of openness to diversity on performance is stronger the more gender-balanced the team is, we show that not only openness but also degree of diversity matters in gender diverse teams. Several implications can be deduced from this.

To start with, our work contributes to extending the diversity and performance literature by showing that the numerical balance affects the relationship between openness to diversity and team performance. In addition, our study is original in so far that openness to diversity is not considered to be only a moderating variable, but rather a key asset that teams should possess in order to ensure positive performance. This asset will then be leveraged more or less depending on the gender balance in the team. It is thus not the fault line alone that matters, but the relative size of the sub-groups that can be delineated.

Second, our study extends debates about the potential negative impact of having a low number of women – or just a single one – in high-level teams (Helfat *et al.,* 2006; Eagly and Carli, 2007). Our results indicate that even a low degree of gender diversity does not inhibit a correlation between openness to diversity and performance. Moreover, this result assesses that, in addition to attitudes, numerical team composition does matter if organizations want to reap the full benefits of gender diverse teams. Indeed, our results show that it is a higher degree of diversity, rather than an incidental presence of minority gender groups, that matters.

We thus add to critical mass theory, which is for now mainly restricted to studies on women in boards of directors (Torchia *et al.*, 2011; Joecks *et al.*, 2013; Kogut *et al.*, 2014) or experiments with students (West *et al.*, 2012; Hoogendoorn *et al.*, 2013), by showing thresholds and their effects in other populations, such as academic teams, and for teams with the full spectrum of gender distribution. In addition, we present an original study in which degree of gender diversity is used as a moderating rather than explanatory variable for team performance.

Limitations and research avenues

This study was conducted on academic research teams in the natural science discipline in Northern Europe. Hence, the generalization of our results to other types of teams or to teams in other regions has to be considered cautiously, as economic, socio-cultural or legal factors influence how men and women engage in the workplace (Banihani and Syed, 2017). Nevertheless, a theoretical generalization means that, for example, our findings could have implications for research on other knowledge-intensive teams such as R&D teams, top management teams or corporate boards. This needs to be tested in future studies. The current article focused on gender diversity; clearly, other aspects of diversity deserve academic scrutiny. In particular, other strong demographic aspects such as race/ethnicity should be studied, as the integration of skilled migrants in higher-level occupation is a topical issue (Crowley-Henry *et al.*, forthcoming). Also, other aspects of deep-level vs. surface-level diversity as well as their interplay should be further explored (see for example Nielsen and Huse, 2010). To extend our findings, it could also be of interest to integrate both level of gender diversity and openness to diversity as variables in meta-analyses about gender diversity and performance.

In addition, even though common method variance (CMV) has been argued to be greatly overestimated (Spector, 2006), this could have affected our results. However, objective variables such as gender diversity should not cause CMV. Moreover, it has been established that interaction effects cannot be caused by CMV (Siemsen *et al.*, 2010).

Finally, although team performance is often assumed to be a dependent variable, dual causalities could also be at stake so that high-performing teams would have the emotional surplus to be more open to diversity. For better investigative control, a longitudinal design or an experiment protocol could have been applied. This, however, might have introduced other methodological problems such as low response rates (cf. Menard, 1991).

Practical implications

Overall, our findings show the positive effect on performance of more gender balanced teams and should thus encourage human resource practices in that direction. More specifically, our study indicates that managers and team leaders should encourage and help develop openness to diversity in teams since this will affect performance positively once gender diversity is above a given threshold. It has previously been shown that positive diversity attitudes can be a result of informal interaction practices, but they can also be encouraged by the organization through formal policies and routines (Mor-Barak *et al.*, 1998). Such encouragement and development could take place at the individual as well as the team and organizational levels.

At the individual level, human resource management efforts could, for example, focus on training: training of individuals' diversity awareness has a documented positive impact on group behaviour, for example through acquiring knowledge about minority cultures (Kulik and Roberson, 2008). At the team and organizational levels, strategies and policies can be implemented to develop open and inclusive attitudes in interaction and collaboration with dissimilar others (Mor-Barak *et al.*, 1998). This can be done in the form of missions, evaluations, and reward structures. Emphasizing positive diversity attitudes as an important code of ethics and ensuring that people behave in ways consistent with the portrayed values may improve the functioning of diverse groups.

A more informal approach could also be applied. For example, social events could be facilitated allowing staff members to become acquainted with each other thus developing tolerance for dissimilarities as contact and interaction are known to decrease stereotyping and discrimination (Pettigrew, 1998). Managers or team leaders could also publicly emphasize that diverse perspectives on problem-solving issues are valued in the organization. Indeed, existing studies have shown that if individuals see diversity as useful, they will see it in a more positive light (Pelled *et al.*, 1999; Lauring and Selmer, 2010).

In turn, there are practical implications for recruitment and avoidance of churn if such positive diversity attitudes are developed: Chrobot–Mason and Aramovich (2013) as well as McKay *et al.* (2007) found that individual-level perceptions of the value of diversity in a firm were negatively associated with turnover intentions, for example. In the same vein, Hickes-Clarke and Iles (2000) found an inclusive diversity climate to be positively associated with organizational commitment, job satisfaction, satisfaction with managers and career commitment.

Finally, organizations that are promoting diversity are considered more attractive as employers by women and ethnic minorities (Williams and Bauer, 1994; Ng and Burke, 2005), as well as by both women and men who value equality and corporate social responsibility (Turban and Greening, 1997; Martins and Parsons, 2007). This means that such firms should be able to recruit from a larger talent pool and contribute to fulfil both ethical and business objectives. Overall, such elements could lead to better performing gender diverse teams in a societal context where an increasing number of women are joining the workforce at all hierarchical levels, and where teams are increasingly gender diverse (cf. Dwyer *et al.*, 2003; Muzio and Tomlinson, 2012).

Conclusion

In this study, we have set out to extend scholarship about diversity and performance as well as critical mass theory by testing the influence of diversity attitudes on the performance of gender diverse teams and refined this model by testing the moderating effect of degree of gender diversity on this relationship. Our findings show that openness to diversity positively impacts the performance of gender diverse teams, and moreover that such attitudes are more effective when team gender diversity is high rather than low, namely, when teams are closer to numerical gender balance. These rather unassuming yet novel and important findings support the need for further studies about attitudes towards diversity and gender diversity. Practical implications include the need for increased managerial focus on facilitating an open and tolerant team climate by training individuals in diversity understanding and strengthening the social cohesion across social categories, in addition to favouring the recruitment of demographically diverse individuals.

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Appendix A. Descriptive statistics for scale items

Appendix B. Scale item correlations

	1	2	3	4	5	Ι	II
Performance							
Item 1	-						
Item 2	0.49	-					
Item 3	0.58	0.39	_				
Item 4	0.70	0.42	0.56	_			
Item 5	0.52	0.43	0.56	0.51	-		
Openness							
Item I	0.15	0.14	0.14	0.13	0.14	-	
Item II	0.21	0.22	0.19	0.19	0.20	0.56	_
Item III	-0.14	-0.22	-0.16	-0.16	-0.18	-0.32	-0.37

All correlations are significant at a 0.1% level.

Item no.	Phrasing	Mean	Std. Dev.	Min.	Max.
	Performance	5 (0	0.07		-
1	Team members' general	5.68	0.87	I	1
2	Team members' ability to get along with others	6.04	0.89	1	7
3	Team members punctual task completion	5.17	1.01	1	7
4	Team members' level of performance quality	5.60	0.87	2	7
5	Team members ability to achieve organizational objectives	5.18	1.04	1	7
1	Team members make an extra effort to listen to people who hold different work values and/or motivations.	4.80	1.11	2	7
2	Team members are keen to learn from people who have different work values and/ or motivations.	5.05	1.09	1	7
3	Team members avoid contact with people that hold other values.	2.38	1.17	1	7

Appendix C. CFA structural equation model

Standardized	OIM Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Measurement						
b1_1 <-						
TeamPerformance	0.8322865	0.0134711	61.78	0.000	0.8058837	0.8586894
_cons	6.523859	0.1432993	45.53	0.000	6.242998	6.804721
b1_2 <						
TeamPerformance	0.5720602	0.0230129	24.86	0.000	0.5269557	0.6171648
_cons	6.818543	0.1494881	45.61	0.000	6.525552	7.111534
b1_3 <						
TeamPerformance	0.7157146	0.0179711	39.83	0.000	0.6804919	0.7509373
_cons	5.131737	0.1142686	44.91	0.000	4.907774	5.355699
b1_4 <						
TeamPerformance	0.7998873	0.0144454	55.37	0.000	0.7715749	0.8281997
_cons	6.450295	0.1417564	45.50	0.000	6.172458	6.728133
b1_5 <-						
TeamPerformance	0.6714383	0.0197835	33.94	0.000	0.6326634	0.7102133
_cons	5.008123	0.1117126	44.83	0.000	4.78917	5.227075
d1_1 <-						
OpennessToDiversity	0.6858261	0.0271499	25.26	0.000	0.6326134	0.7390389
_cons	4.330649	0.0977896	44.29	0.000	4.138985	4.522313
d1_2 <						
OpennessToDiversity	0.817962	0.0281893	29.02	0.000	0.7627121	0.873212
_cons	4.625784	0.1038282	44.55	0.000	4.422285	4.829284
d1_3 <						
OpennessToDiversity	0.4650181	0.029623	15.70	0.000	-0.523078	-0.406958
_cons	2.031758	0.0531348	38.24	0.000	1.927616	2.135901
var(e.b1_1)	0.3072991	0.0224236			0.2663479	0.3545467
var(e.b1_2)	0.6727471	0.0263296			0.6230717	0.7263829
var(e.b1_3)	0.4877526	0.0257243			0.4398522	0.5408694
var(e.b1_4)	0.3601803	0.0231093			0.317619	0.4084448
var(e.b1_5)	0.5491705	0.0265668			0.4994928	0.603789
var(e.d1_1)	0.5296425	0.0372402			0.4614591	0.6079004
var(e.d1_2)	0.3309381	0.0461155			0.2518452	0.4348705
var(e.d1_3)	0.7837582	0.0275504			0.7315785	0.8396597
var(TeamPerformance)	1					
var(OpennessToDiversity)	1					
cov(GenderDiversity,TeamPerformance)	0.0185815	0.0326435	0.57	0.569	-0.045399	0.082562
cov(GenderDiversity,OpennessToDiversity)	0.05815	0.0347945	1.67	0.095	-0.010046	0.126346
cov(TeamPerformance,OpennessToDiversity)	0.3221186	0.0345976	9.31	0.000	0.254309	0.389929
LR test of model vs. saturated: chi2(25)	=	108.08,			0.0000	
			Prob > cl	ni2 =		

All scale variables in the structural equation model are significant at the 1% level. The model is estimated through MLE based on a total of 1085 observations and has a Log likelihood ratio of

-10560,69. Goodness-of-fit statistics report the following values for the various decision criteria: SRMR = 0.035, RMSEA = 0.055; 90% CI: 0.045-0.066; p (RMSEA ≤ 0.05) = 0.193; CFI = 0.971; TLI = 0.958.