

## **Team Gender Diversity: Does it matter?**

*The Relationship Between Gender Diversity, Team Performance, Team Satisfaction and  
Prejudice towards Women.*

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## **Abstract**

The aim of this cross-sectional questionnaire study was twofold. First, the relationships between team gender diversity and team performance, and between team gender diversity and team satisfaction were examined for 197 office employees from a technical service company located in the UK. Interdependence was taken into account as a moderator to explain the divergent outcomes from previous team diversity studies. Interdependence is argued to weaken the otherwise negative relationships between team gender diversity and team performance and team gender diversity and team satisfaction. No relationship was found between team gender diversity and the two outcome variables. Interdependence, however, was positively associated with both outcome variables. Secondly, the relationship between percentage of women in a team and prejudice against women was examined for the 124 male participants, with positive contact as a mediator of this relationship. A negative relationship was found between percentage of women in a team and prejudice against women, but positive contact did not explain this relationship. A higher percentage of women in a team was related to less reported prejudice against women by male employees. The results of the first part of the study signal the importance of studying other (contextual) factors, such as interdependence rather than team gender diversity, that influence team performance and team satisfaction. The second part of the results show the importance of studying team gender diversity in relationship with interhuman relations, and not just with organisational outcomes.

## **Introduction**

Worldwide, there is a higher rate of male labour force participation compared to women. But the percentage of women who participate in the labour force is increasing and the gender differences in participation rates are narrowing (Ortiz-Ospina & Tzvetkova, 2017). Data shows that the employment rates for women in the UK in August 2019 was 72% and 80% for men, compared to 65% for women and 75% for men 10 years ago (Leaker, 2019). Work participation is important because it contributes to economic independence and stimulates self-development and well-being of individuals (Huijnk, 2013). This is why it is important that everyone has equal access to the labour market. Simultaneously, organisations need work teams consisting of people of diverse backgrounds and knowledge to increase their competitive advantage (Horwitz & Horwitz, 2007). With the increasing number of women participating in the workforce, organisations face the challenge of managing a more gender diverse workforce.

This study will look into the relationship between gender diversity in teams and team outcomes, such as team performance and team satisfaction. Team performance and team satisfaction are important for organisations, but also for the employees in those organisations. Next to organisational outcomes, gender diversity at work might also influence interhuman relations in the workplace and beyond. Therefore, this study will also look into prejudice against women among employees working in teams that vary in terms of gender diversity.

What has been studied extensively is the effect of demographic diversity team performance, but these results are still inconclusive (Webber & Donahue, 2001, Horwitz & Horwitz, 2007, Chatman & Flynn, 2001). Demographic team diversity refers to diversity based on demographic attributes such as age, gender and racial background (Molleman, 2005). The effect of a specific type of diversity, such as gender, on team

performance has been studied to a lesser extent. Researchers that focused on the effect of gender diversity on team performance found similar effects on team outcomes as demographic diversity. Some found a negative effect of gender diversity on performance and some did not find any effect at all (Choi & Rainey, 2010, Ely, 2004, Ali, Kulik, & Metz, 2011, Bell, Villado, Lukasik, Belau, & Briggs, 2011). It is speculated that these divergent findings might be the result of different research contexts. The negative effects of gender diversity were not found in lab settings, but they were in field settings. Current research will examine if this negative relationship is indeed existent in the workplace.

A team outcome that has not been studied extensively is team satisfaction. Research showed that higher demographic homogeneity in teams results in less turnovers (Hamilton, Nickerson, & Owen, 2004, O'Reilly III, Caldwell, & Barnett, 1989) and that individuals from demographic heterogeneous teams are less satisfied (Chatman & Flynn, 2001). Current research will add to this framework by studying the relationship between gender diversity specifically and team satisfaction.

Previous research indicated that interdependence might have a moderating effect on the relationship between demographic team diversity and team performance and team satisfaction (Jehn, Northcraft, & Neale, 1999, Van der Vegt, Emans, & Van de Vliert, 2001, Schippers et al., 2003). Interdependence is the degree to which members must work together to perform effectively (Gully, Incalcaterra, Joshi, & Beaubien, 2002). Diverse teams are less communicative than more homogeneous teams (Schippers, Den Hartog, Koopman, & Wienk, 2003) and since interdependence encourages cooperation and the sharing of diverse perspectives, it is likely to offer more benefits for diverse teams than for homogeneous teams (Grand & Parker, 2009).

In sum, the vast majority of team diversity research focuses on the influence of demographic diversity on team performance and team satisfaction. This study will add

to previous research by studying gender diversity specifically. To try to explain the divergent outcomes from previous studies, interdependence is included as a possible moderator in the relationship between gender diverse teams and team performance and satisfaction. Building on previous research it is likely that interdependence weakens the negative effect of gender diversity on team performance and team satisfaction.

Research about team diversity focuses mainly on the effects on team outcomes and whether it is profitable for an organisation to have diverse work teams. Less attention is paid to the effects on interhuman relations at the workplace. Nevertheless, this is also important because diversity may lead to prejudice or discriminatory behaviours and this can be detrimental to employees' well-being (Tropp, 2003, Deitch et al., 2003, Fiske & Lee, 2008). One study found that demographic workplace diversity can have a positive effect on inter-group attitudes, and this can be explained by positive inter-group contact (Laurence, Schmid, & Hewstone, 2017). Positive contact differs from interdependence, because it involves a personal valence. Contact is seen as positive when individuals experience the contact as highly enjoyable. Interdependence does not entail emotional appraisals of individuals; it is more about how teams and organisations are structured.

### **Theoretical background**

Diversity is referred to as '*differences between individuals on any attribute that may lead to the perception that another person is different from self*' (Van Knippenberg, De Dreu, & Homan, 2004). Team diversity refers to the variety of differences between people in a team. Diversity involves not only how people perceive themselves but also how they perceive others. (Patrick & Kumar, 2012). The maximum gender diversity in a team is when a team is composed of 50% male and 50% female employees, making a

team heterogeneous. The lowest amount of gender diversity in a team is reached when there is a team with 100% male or 100% female, making a team homogeneous.

Team diversity is often described as a double-edged sword. The optimistic view focuses on diverse teams' access to a variety of resources that, if properly used, could enhance the performance of diverse teams (Kravitz, 2005). The more pessimistic view focuses on the irreconcilable differences between heterogeneous team members, which lead to dysfunctional team interaction and suboptimal performance (Horwitz & Horwitz, 2007).

The optimistic view is based on the *cognitive resource theory*, which states that a more diverse team regarding demographic variables related to the task, might be more successful than a more homogeneous team, because they have access to a wider variety of resources (Bell, Villado, Lukasik, Belau, & Briggs, 2011). Related to this theory is the theory of *social networks*. A diverse team has access to a larger network, and with this access to a larger pool of information, skills, and support (Fay & Guillaume, 2007). Both of these theories predict greater advantages of team diversity for high job-related diversity, such as educational background and functional background, and less advantages for less job-related diversity, such as ethnicity or gender.

The pessimistic view on team diversity is based on the *similarity-attraction hypothesis*, *social identity theory* and *social categorisation theory*. The *similarity attraction hypothesis* posits that people will favour people who they think are more similar to themselves over people who they feel are different from themselves (Byrne, Clore, & Smeaton, 1986). Associated with decreased interpersonal liking is poorer communication and less information sharing (Fay & Guillaume, 2007). More diverse teams consist of people who view themselves as different from one another. This suggests that heterogeneous teams have lower team performance and satisfaction than

homogenous teams, due to decreased personal liking and thus poorer communication and less information sharing. Furthermore, if perceived similarity results in greater liking, greater demographic similarity in the workplace should result in less perceived discrimination (Avery, McKay, & Wilson, 2008).

Similar effects are predicted by the *social categorisation theory* and the *social identity theory*. Social categorisation theory assumes that people have the natural tendency to simplify the world and sort themselves and others into social categories (e.g. according to physical appearance, attitudes, demographic variables). Due to their visibility and salience, demographic attributes (e.g. race, gender, age) are often used to categorize oneself and others (Kulik & Bainbridge, 2006). For example, individuals can sort their team members into the category's male and female. The social identity theory states that part of an individuals' self-identity is derived from the membership of such a social category. This part is called their social identity. To maintain a positive social identity, individuals will evaluate the category to which they belong (their in-group) as more positive than the other category's (their out-group) (Tajfel & Turner, 1986). This is known as the in-group bias. This process undermines group functioning, reduces task commitment and is suggested to decrease team performance (Fay & Guillaume, 2007). According to these theories it would be expected that men evaluate women more negatively than men, since this is their out-group and that women evaluate women more positively, since this is their in-group. Accordingly, men will report higher prejudice against women than women.

According to the similarity attraction hypothesis and the social categorisation theory and social identity theory, team gender diversity leads to poorer communication and decreased personal liking, which in turn negatively affects team performance and team satisfaction. A possible moderator in this relationship is interdependence. When

interdependence is high the need for coordination and planning increases (Cheng, 1983), which improves communication and in turn may lead to higher team performance, especially in gender diverse teams. Furthermore, interdependence might foster friendship and belonging and attachment to one's team and in turn team satisfaction (Van Der Vegt, Emans, & Van De Vliert, 2000). Interdependence might thus counteract the otherwise negative effects of team gender diversity on team performance and team satisfaction.

Building on the in-group bias phenomenon, Allport's contact hypothesis (1954) provides an explanation of why team gender diversity may lead to less prejudice against women. This hypothesis states that contact between different groups allow people to learn about their out-group and that this information results in less prejudice towards that out-group and its members (Allport, Clark, & Pettigrew, 1954). Team gender diversity obliges employee to engage in inter-group mixing (Laurence, Schmid, & Hewstone, 2018) and thus learn more about the out-group which will result in less prejudice against that group.

There is a large body of research testing these various theories. The studies most relevant for the current research will be described below and will be linked to the conforming theories. Thereupon, the different hypothesis and expectations will be specified.

## **Literature Review and Hypotheses**

**Team performance.** The relationship between diversity and team performance has been studied extensively. Team performance is defined as the extent to which a team accomplishes its goals or mission (Devine & Philips, 2001). Most studies compare the effects on team performance of high job-related and low job-related diversity (Webber & Donahue, 2001), or high task-related diversity and low task-related diversity



(Horwitz & Horwitz, 2007). Researchers that examined the effects of gender diversity specifically, often did this in an organisational context. The results from these studies are inconclusive. Ely (2004) looked into the effects of diversity in retail bank branches and found that gender diversity was unrelated to firm performance. Choi and Rainey (2010) addressed the effects of diversity on employee perceptions of organisational performance in US federal agencies. In agencies where the proportion of male and female employees were similar, organisational performance was perceived higher than it was in other agencies. Similar results were discovered by Alik, Kulik and Metz (2011). They found that organisational gender diversity was positively related to organisational performance. The outcomes of studies looking into the effects of gender diversity on team performance are also mixed. Baugh and Grean (1997) found that members from cross-functional project teams that vary with respect to gender composition rate their team as less effective than members of homogeneous teams. When looking at the performance rating from external evaluators, no differences based on team composition was found. Myaskovsky, Unikel, and Dew (2005) also found no performance differences when studying the effect of gender diversity in small work groups on performance in a radio assembling task. A meta-analysis by Bowers, Pharmer, and Salas (2000) showed that gender homogeneity of a group has only a small positive effect on task performance, but only when tasks were not complex. A more recent meta-analysis conducted by Bell, Villado, Lukasik, Belau, & Briggs (2011) found small negative effects of gender diversity on team performance. Based on these two meta-analyses a curvilinear relationship is expected team gender diversity and team performance. It is expected that members from more gender diverse teams rate their team performance lower than members from less gender diverse teams. From these expectations the following hypothesis is derived.

H1a. Gender diversity in teams is negatively related to team performance.

**Team satisfaction.** A team outcome that has been studied less extensively in relation with gender diversity is team satisfaction. Previous research showed that demographic team diversity leads to increased turnovers (Hamilton, Nickerson, & Owan, 2004). The increase of turnovers due to demographic diversity suggests that members of diverse teams are less satisfied with their team than members of more homogeneous teams. The results from a study by Chatman and Flynn (2001) confirm this idea. They calculated relational demography scores to reflect sex, race, and citizenship differences between individuals and other team members. Social categorisation theory focuses on visible differences within a group, and therefore the three individual scores were summed to create an overall measure of demographic diversity. They found that, in line with expectations from social identity theory and social categorisation theory, demographic team heterogeneity (sex, race, and citizenship) was negatively related to members' satisfaction with their team. Based on the results from the study from Chatman and Flynn (2001) a curvilinear relationship is expected between team gender diversity and team satisfaction. It is expected that members from more gender diverse teams experience lower satisfaction with their team than members from less diverse teams. From these expectations the following hypothesis is derived.

H1b. Gender diversity in teams is negatively related to team satisfaction

**Interdependence as a moderator.** The divergent results from previous studies might be explained by contextual factors that influence the relationship between gender diversity in teams and team performance, and team satisfaction. As theorised before,

one such factor is interdependence. Interdependence can be divided into task-interdependence, the amount of task-driven interaction between employees and goal/outcome interdependence, which is the extent of interconnection among team members that guides their performance and efforts (Gully, Incalcaterra, Joshi, & Beaubien, 2002). Grant and Parker (2009) argued that team interdependence is more likely to be beneficial for heterogeneous teams than it is for homogeneous teams. When teams do not have shared goals to pull the team members together, homogeneous teams tend to be more communicative than heterogeneous teams (Schippers, Den Hartog, Koopman, & Wienk, 2003). That is why heterogeneous teams specifically can benefit more from interdependence. Following this line of reasoning, interdependence weakens negative relationship between team gender diversity and team performance and team satisfaction. This idea is confirmed by results from the study of Jehn, Northcraft, and Neale (1999). They found that demographic team diversity leads to greater satisfaction when task-interdependence is high than when it is low. Van Der Vegt, Emans, & Van De Vliert (2001) also found that task-interdependence within a team is positively related to group member's team satisfaction. A study by Schippers, Den Hartog, Koopman, and Wienk (2003) showed that outcome interdependence moderated the relationship between overall team diversity and both team satisfaction as well as team performance. They found that teams with high outcome interdependence and high levels of diversity are more satisfied with the team and outperform teams with lower levels of diversity and lower levels of outcome interdependence (Schippers, Den Hartog, Koopman, & Wienk, 2003). The benefits of interdependence are probably more pronounced in gender diverse teams, because it prevents sub-group formation based on gender within a team, and forces everyone to communicate and work together. In the current study interdependence within gender diverse teams will be studied as a factor that shapes

team performance and satisfaction of those teams. Since previous research showed positive effects of both task-interdependence and outcome interdependence, these are taken together as overall interdependence. It is expected that interdependence diminishes the otherwise negative effects of gender diversity in teams on team performance and team satisfaction.

H1c. Interdependence moderates the relationship between gender diversity in teams and team performance. Interdependence will weaken the negative relationship between gender diversity and team performance.

H1d. Interdependence moderates the relationship between gender diversity in teams and team satisfaction. Interdependence will weaken the negative relationship between gender diversity and team satisfaction.

**Prejudice.** As noted before the effect of team diversity on team outcomes is studied oftentimes. What has been studied to a lesser extent is the effect of team diversity on the interhuman relationship of team members. One possible relational problem that might occur in diverse teams is prejudice. Allport (1954) defined prejudice as *'a negative attitude based on faulty and inflexible generalization. It may be felt or expressed. It may be directed toward a group as a whole, or toward an individual because of his/her group membership'*. It is important to study prejudice, because prejudice within teams can have negative consequences; it can have a negative effect on team members emotional state (Tropp, 2003), job satisfaction (Deitch et al., 2003), organisational performance (Goldman, Gutek, Stein, & Lewis, 2006), and can lead to discriminatory behaviour (Fiske & Lee, 2008).

Prejudice against women is still an important topic, because women in male-dominated groups receive more negative evaluations than men in those groups (Williams & O'Reilly, 1998). Furthermore, a study by West, Heilman, Gullett, Moss-Racusin, and Magee (2012) showed that men, simply by working alongside women can also be detrimentally affected by the negative stereotypes about women. As the number of women in a team increases, the evaluation of the team as a whole may change in a way that it is consistent with women stereotypes, and filter down to attitudes towards members of team, whether they are male or female (West, Heilman, Gullett, Moss-Racusin, & Magee, 2012). Furthermore, research showed that perceived sex-based discrimination at work was more prevalent among female than male employees (Avery, McKay, & Wilson, 2008). This is why this research looks into how prejudiced male employees are against women.

Few studies have tested whether individuals in more diverse teams are more or less prejudiced against women compared to less diverse teams. According to Kanter (as cited in Baugh & Graen, 1997) women in male-dominated firms experience more conflict among women and encounter more stereotypes than in gender-balanced firms. A possible explanation for this finding comes from Allports' contact hypothesis (1954). This hypothesis states that contact between different groups allow people to learn about their out-group and that this information results in less prejudice towards that out-group and its members (Allport, Clark, & Pettigrew, 1954). This effect also translates to the workplace. Higher workplace diversity is associated with more personal contact with out-groups (Wagner et al., 2006, Benschop, 2010). Research found that greater opportunity for intergroup contact reduces prejudice (Pettigrew & Tropp, 2000, Schlueter & Wagner, 2008, Wagner et al., 2006). It is expected that this effect also translates to the context of teams in the workplace. Following this line of thinking, a

higher percentage of women in a team provides more opportunity for contact with the out-group (women) for men, and thus decreases prejudice against women.

H2a. For men, the percentage of women in a team is negatively related to prejudice against women.

**Positive contact as a mediator.** Results from Laurence, Schmid and Hewstone (2017) confirm the idea of the contact hypothesis but only when intergroup contact is experienced as positive. They examined the relationship between ethnic diversity in the workplace and negative intergroup attitudes, with contact as a mediator. They found that exposure to out-groups increased opportunities for inter-group mixing, which in turn lead to positive inter-group contact and more positive inter-group attitudes. Their study focused on ethnic diversity in the workplace, but following this line of thinking, it is expected that this effect also translates to the context of gender diversity in teams.

H2b. Positive contact mediates the relationship between percentage of women in a team and prejudice against women. When the contact is experienced as more positive it will lead to less prejudice.

Figure 1 provides a schematic overview of all the hypotheses.

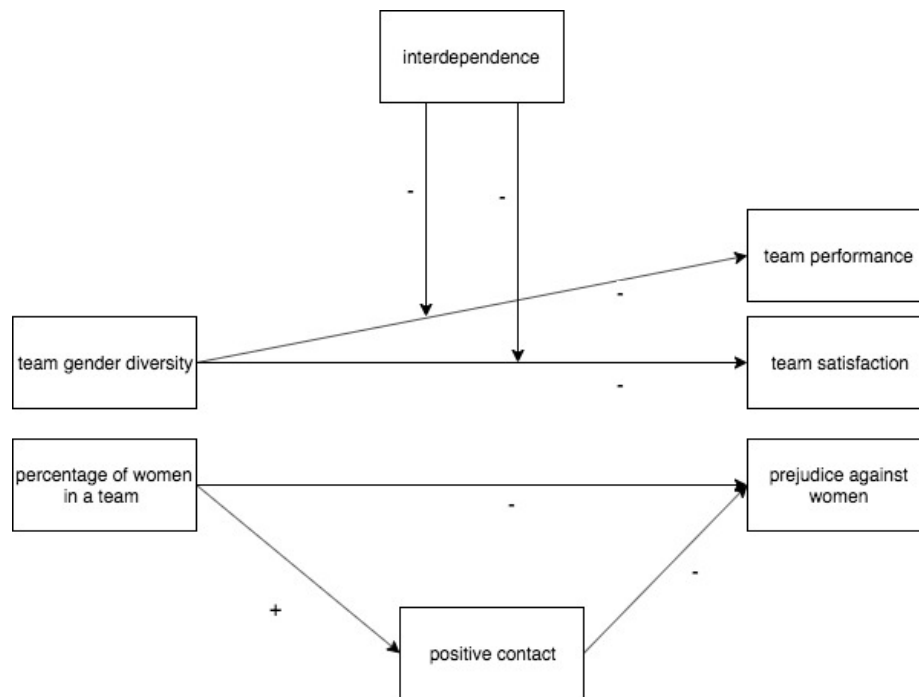


Figure 1, overview of the hypotheses.

## Method

### Research Design

This study used a cross-sectional research design. Data was collected from members of nine different teams, with a different percentage of women in each team. The independent variable was team gender diversity. This variable was measured on a team-level. The dependent variables were team performance, team satisfaction, and prejudice against women. Interdependence was taken into account as a moderator and positive contact as a mediating variable. The dependent variables as well as the moderator and mediator were measured on an individual level.

### Participants

In total 197 office employees from a technical service company located in the UK participated in this study. Of this sample 71 participants identified as female, 124 as male and 2 as neither. Each participant belonged to one of the following teams: Asset integrity, Business Development & Strategy, Finance (including IT, Legal, and Facilities),

HR (including Recruitment, Logistics, and Training Center), HSSEQ, Maintenance & Modifications, Project & Contract Management, Heat Treatment, and Aberdeen Base. People participated on a voluntary basis. There were no specific exclusion criteria, but only English-speaking people could participate in this study. To collect the data, convenience sampling via own network was used.

## **Measures**

**Gender diversity.** Team gender diversity was measured as the percentage of women in a team. This percentage was calculated for each team with the use of demographic team data provided by the HR administration centre. Diversity is greatest when the percentage of women in a team was 50 and lowest when the percentage of women in a team was 0 or 100. To examine the effect of team gender diversity using the percentage of women in a team, a quadric term of the percentage of women in a team was added. This operationalisation was used to answer Hypothesis 1a, 1b, 1c and 1d. To test Hypothesis 2a and 2b, percentage of women in a team was used as the independent variable.

**Team performance.** A three-item performance scale was used to measure team performance. The items from this scale were: 'Our team is very competent', 'Our team performs the job well', and 'Our team gets the work done very effectively'. The participants answered on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) (Groves & Feyerherm, 2011). The Cronbach's alpha for this scale was .90, which indicates a very high internal consistency.

**Team satisfaction.** The following three items measured team satisfaction: 'I am satisfied with my present colleagues', 'I am pleased with the way my colleagues and I work together', and 'I am very satisfied with working in this team'. The participants



answered on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) (Van Der Vegt et al., 2001). This scale was found to be highly reliable ( $\alpha = .94$ ).

**Interdependence.** Seven items were used to measure team interdependence. Example questions are: 'I have to obtain information and advice from my colleagues in order to complete my work', 'I have a one-person job (reversed scored)', 'I have to work closely with my colleagues to do my work properly', and 'Team members receive feedback on the basis of their collective performance' (Van Der Vegt et al., 2001). These questions were answered on a 5-point scale, ranging from 1 (disagree) to 5 (agree). This scale was found to be moderately reliable ( $\alpha = .69$ ).

**Prejudice against women.** To measure prejudice against women the Attitudes Towards Diversity Scale (ATDS) was used (Montei, Adams, & Eggers, 1996). Ten questions regarding attitudes towards female co-workers were subtracted from this scale. The scale was not coded separately for men and women. Example questions were: 'I often pick up slack for some of my female co-workers who are less productive', 'The most qualified workers in my job seem to be male', and 'I feel that increasing the hiring of women can only help this organisation' (reverse scored). The participants answered on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Cronbach's alpha for this scale was .70, which indicates a moderate internal consistency.

**Positive contact.** A three-item scale was composed for this study to measure positive contact. The items from this scale were: 'I enjoy the contact I have with my team members', 'I experience the communication within my team as mainly positive', and 'I value the relationships I have with other team members'. The participants answered on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This scale was highly reliable ( $\alpha = .86$ ).

## **Procedure**

To gather demographic data of the teams in the UK office, the HR administration was contacted. They provided information on the gender composition of each of the 48 teams. In consultation with HR, some teams were merged to ensure the anonymity of the participants. In the end a distinction was made between nine different teams. It was agreed with the HR Director in the UK that the questionnaire would be send out there to all 445 UK office employees. They received an email with a link to the online questionnaire. After agreeing with the informed consent, see Appendix A, the participants filled out the 32-item questionnaire online. The questions regarding prejudice against women were last, to make sure thinking about this did not affect the judgement of their team satisfaction and team performance. See Appendix B for the complete questionnaire. After one week a reminder email was sent out to thank the people who already filled out the questionnaire and to remind the people who did not yet do this.

## **Results**

Of the 243 participants that started the questionnaire, 46 individuals did not finish all the questions. No outliers were deleted from the dataset. The data of the remaining 197 participants was used for the analyses.

The average score for each subscale that measured team satisfaction, team performance, interdependence, positive contact, and prejudice against women, was calculated. These scores were used in further analyses. Because objective data was available about the gender composition of each team the question: ‘The percentage of women in my team is’ was not taken into account in further analyses.

To get some first impressions of the data, a correlation analysis was conducted. Table 1 shows the correlations between the two independent variables and the five

dependent variables examined in this study. This correlation matrix shows that there is a high correlation between the two independent variables,  $r = .98$ , and this indicates that multicollinearity is a problem. This problem will be addressed in the discussion section.

Table 1

*Correlations Between All Variables*

Measure	1	2	3	4	5	6
1. Team gender diversity	-					
2. Percentage of women in a team	.98**	-				
3. Team performance	-.02	-.02	-			
4. Team satisfaction	< -.01	.01	.68**	-		
5. Interdependence	-.01	< .01	.28**	.30**	-	
6. Prejudice against women	-.06	-.05	-.28**	-.27**	-.13	-
7. Positive contact	0.01	< .01	.71**	.78**	.33**	-.24**

\*\* Correlation is significant at the 0.01 level

### **Gender Diversity in Teams and Team Performance**

Hypothesis 1a predicts that gender diversity in teams is negatively related to team performance and Hypothesis 1c predicts that interdependence moderates the relationship between gender diversity in teams and team performance. To test these hypotheses a hierarchical multiple regression analysis was conducted. Centred variables were used to avoid potentially problematic high multicollinearity. In the first step, two variables were included: team gender diversity, and interdependence. These variables accounted for a significant amount of variance in team performance,  $R^2 = .08$ ,  $F(3,193) = 5.46$ ,  $p = .001$ . No support was found for Hypothesis 1a, team gender diversity has no significant effect on team performance. However, interdependence has a significant effect on team performance, see Table 2. Next, the interaction term between interdependence and team gender diversity was added to the regression model, which

did not increase the explained variance of team performance,  $R^2 = .02$ ,  $F(2,191) = 1.93$ ,  $p = .15$ . These results indicate that the predicted moderation of interdependence on the relationship between team diversity and team performance is not found (Hypothesis 1c). See Figure 2 for a schematic overview of the results from this moderation analysis.

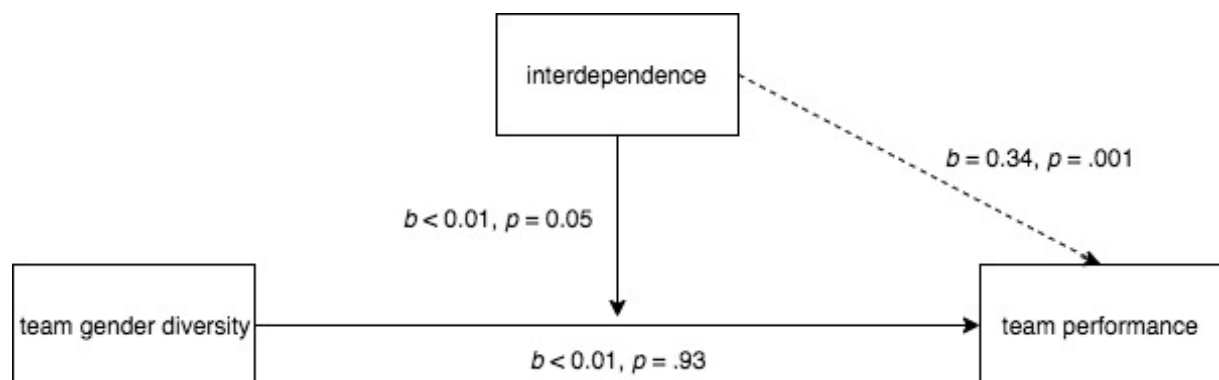
Table 2

*Linear and Non-linear Model of Predictors of Team Performance, with 95% Confidence Intervals. Confidence Intervals and Standard Errors Based on 1000 Bootstrap Samples*

Variable	Model 1		Model 2	
	<i>b</i>	<i>SE B</i>	<i>b</i>	<i>SE B</i>
Constant	4.28 (4.17, 4.39)**	.05	4.28 (4.17, 4.39)**	.05
Percentage of Women	< - 0.01 ( - 0.02, 0.02)	.01	0.11 ( - 0.01, 0.22)	.06
Team Gender Diversity	< 0.01 ( < 0.01, < 0.01)	< .01	< - 0.01 ( < - 0.01, < 0.01)	< .01
Interdependence	0.34 (0.13, 0.54)**	.11	0.62 (0.17, 1.10)**	.24
Interdependence x Percentage of Women			- 0.03 ( - 0.06, < 0.01)	.02
Interdependence x Team Gender Diversity			< 0.01 ( < 0.01, < 0.01)	< .01

*Note:* All variables were centred at their means.

\* $p < 0.05$ . \*\* $p < 0.01$



*Figure 2. Model of team gender diversity as a predictor of team performance moderated by interdependence. Bootstrapped CI based on 1000 samples.*

### **Gender Diversity in Teams and Team Satisfaction**

Another hierarchical multiple regression analysis was conducted to test Hypothesis 1b that predicts that gender diversity in teams is negatively related to team satisfaction, and more specifically if interdependence moderates the relationship between team gender diversity and team satisfaction (Hypothesis 1d). Centred variables were used to avoid potentially problematic high multicollinearity. In the first step, two variables were included: team gender diversity, and interdependence. These variables accounted for a significant amount of variance in team satisfaction,  $R^2 = .09$ ,  $F(3,193) = 6.53$ ,  $p < .001$ . No support was found for Hypothesis 1b, team gender diversity has no significant effect on team satisfaction. However, interdependence has a significant effect on team satisfaction, see Table 3. Next, the interaction term between interdependence and team gender diversity was added to the regression model, which did not increase the explained variance of team satisfaction,  $R^2 = .01$ ,  $F(2,191) = 1.36$ ,  $p = .26$ . These results indicate that the predicted interaction is not found. Interdependence does not moderate the relationship between gender diversity in teams and team satisfaction (Hypothesis 1d). See Figure 3 for a schematic overview of the results from this moderation analysis.

Table 3

*Linear and Non-linear Model of Predictors of Team Satisfaction, with 95% Confidence Intervals. Confidence Intervals and Standard Errors Based on 1000 Bootstrap Samples*

Variable	Model 1		Model 2	
	<i>b</i>	<i>SE B</i>	<i>b</i>	<i>SE B</i>
Constant	4.03 (3.91, 4.15)**	.06	4.03 (3.90, 4.15)**	.06
Percentage of Women	< - 0.01 ( - 0.02, 0.02)	.01	0.10 ( - 0.03, 0.22)	.06
Team Gender Diversity	< 0.01 ( < 0.01, < 0.01)	< .01	< - 0.01 ( < - 0.01, < 0.01)	< .01
Interdependence	0.45 (0.26, 0.67)**	.10	0.74 (0.31, 1.24)**	.23
Interdependence x Percentage of Women			- 0.03 ( - 0.06, < 0.01)	.02
Interdependence x Team Gender Diversity			< 0.01 ( < 0.01, < 0.01)	< .01

Note: All variables were centred at their means.

\* $p < 0.05$ . \*\* $p < 0.01$

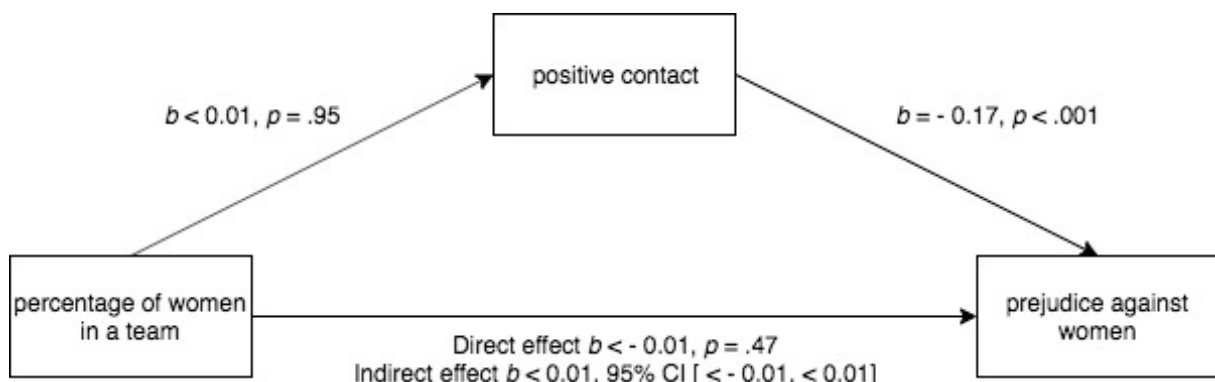


Figure 3. Model of team gender diversity as a predictor of team satisfaction moderated by interdependence. Bootstrapped CI based on 1000 samples.

### Percentage of Women in Teams and Prejudice against Women

A PROCESS regression analysis was used to test the mediation of positive contact on the relationship between percentage of women in a team and prejudice against women. In Step 1 of the mediation model, the regression of the percentage of women in a team on prejudice against women, ignoring the mediator, was not significant,  $b < -0.01$ ,  $t(195) = -0.72$ ,  $p = .47$ . Step 2 showed that the regression of the percentage of women in a team on the mediator, positive contact, was not significant,  $b < 0.01$ ,  $t(195) = 0.06$ ,  $p =$

.95. Step 3 of the mediation process showed that the mediator, positive contact, controlling for the percentage of women in a team, was significant,  $b = -0.17$ ,  $t(194) = -3.48$ ,  $p < .001$ . The first three conditions for mediation were not met, and this means that there is no mediation when looking at the overall research sample,  $b < 0.01$ , 95% CI [ $-0.01$ ,  $< 0.01$ ]. See Figure 4 for a schematic overview of the results from this mediation analysis.

To test Hypothesis 2a that for men the percentage of women in a team is negatively related to prejudice against women, and more specifically the mediating effect of positive contact (Hypothesis 2b), a PROCESS regression analysis was conducted for men and women separately. When only taking the male participants into account, the regression of women in a team on prejudice against women, ignoring the mediator, was significant,  $b < -0.01$ ,  $t(122) = -2.01$ ,  $p = .05$ . This means that for men, the percentage of women in a team is a significant predictor of prejudice against women. In line with the expectations from Hypothesis 2a, the percentage of women in a team is negatively related to prejudice against women. Looking only at the data from female participants this effect is not significant,  $b < 0.01$ ,  $t(69) = 0.96$ ,  $p = .34$ . For both men and women, the regression of the percentage of women in a team on positive contact was not significant,  $b < 0.01$ ,  $t(122) = 1.12$ ,  $p = .26$ , and  $b < -0.01$ ,  $t(69) = -0.75$ ,  $p = .47$ . The effect of positive contact, controlling for the percentage of women in a team, on prejudice against women was not significant for men,  $b = -0.06$ ,  $t(121) = -1.08$ ,  $p = .28$ . But this effect was significant for women,  $b = -0.32$ ,  $t(68) = -3.70$ ,  $p < .001$ . There is no significant indirect effect of percentage of women in a team on prejudice against women through positive contact for men,  $b < 0.001$ , 95% CI [ $-0.001$ ,  $< 0.001$ ], nor for women,  $b < 0.001$ , 95% CI [ $-0.001$ ,  $0.003$ ]. See Figure 5 and 6 for a schematic overview of the results for the mediation analyses for men and women separately.

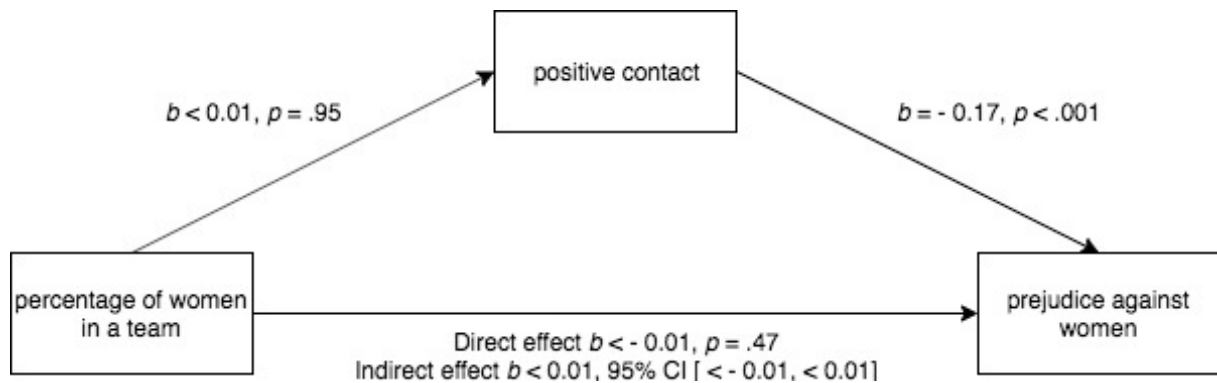


Figure 4. Model of the percentage of women in a team as a predictor of prejudice against women, mediated by positive contact. The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5000 samples.

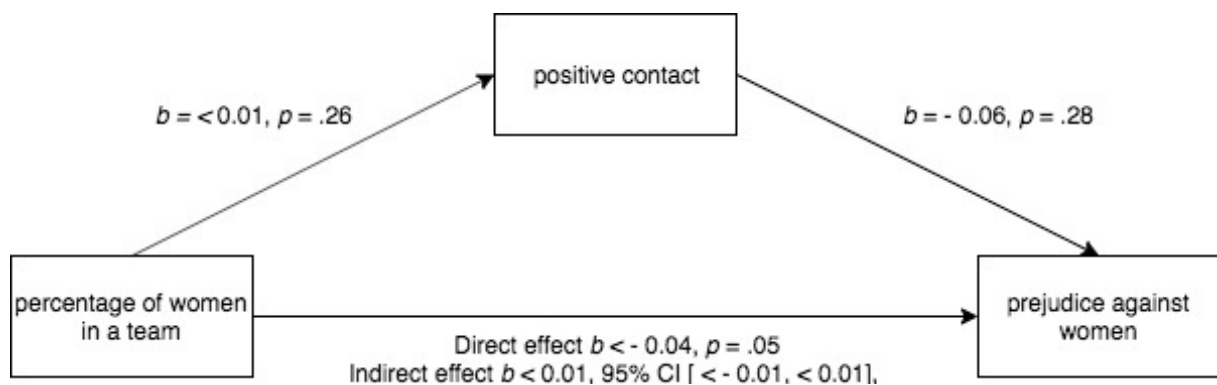


Figure 5. Model of the percentage of women in a team as a predictor of prejudice against women, mediated by positive contact, for men. The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5000 samples.



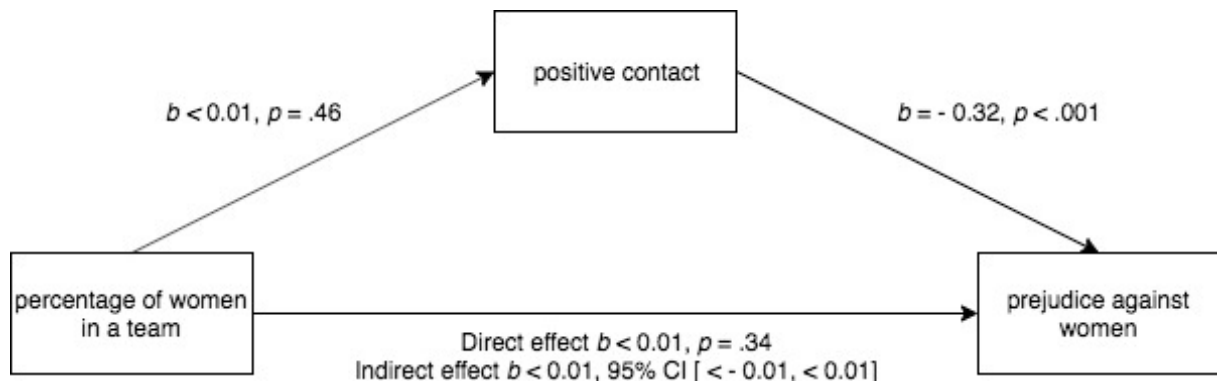


Figure 6. Model of the percentage of women in a team as a predictor of prejudice against women, mediated by positive contact, for women. The confidence interval for the indirect effect is a BCa bootstrapped CI based on 5000 samples.

## Discussion

The aim of this study was to examine the relationship between gender diversity in teams and team performance and team satisfaction, and to see whether interdependence could explain the divergent outcomes of previous studies. No relationship between gender diversity in teams and team performance was found. Increased gender diversity in teams was not associated with higher reported team performance. Also, no relationship was found between gender diversity in teams and team satisfaction. Increased gender diversity in teams was not associated with lower reported team satisfaction. Interdependence did not function as a moderator in these relationships. However, interdependence was positively associated with team performance and team satisfaction directly. Participants that reported higher interdependence in a team also reported higher team performance and higher team satisfaction. The second aim of this study was to examine the relationship between the percentage of women in a team and prejudice against women, with positive contact as a mediator. Overall, the percentage of women in a team was not related with prejudice

against women. A higher percentage of women was not associated with less prejudice against women. However, more positive contact was associated with less prejudice against women. When testing for this relationship for men and women separately, the same pattern occurred only for women and not for men. For male participants, a higher percentage of women in a team was associated with stronger prejudice against women, but positive contact did not mediate this relationship. Men who were part of teams with a higher percentage of women, scored lower on prejudice against women compared to men who were part of teams with a lower percentage of women. Positive contact, however, was not the mechanism that explained this relationship.

The data from this study did not show the negative relationship between team gender diversity and team performance that Bell and colleagues (2011) found in their meta-analysis. In the present study no relationship was found between team gender diversity and team performance. Differences in the way team performance was measured might explain these divergent results. Bell and colleagues (2011) do not specify the team performance measures included in their meta-analysis. A study comparing observer-based measures and self-reported measures of team performance showed that research results might differ as a result of the chosen method (Andersson, Rankin, & Diptee, 2017). In future research, it might be beneficial to use several measures of team performance to develop a more comprehensive view of the relationship between team diversity and team performance.

The data from this study did not show the negative relationship between team gender diversity and team satisfaction that Chatman and Flynn (2001) found in their study. This is probably caused by the different types of diversity studied. In their study Chatman and Flynn (2001) study demographic diversity as a whole, and the present study studied gender diversity specifically. When studying demographic diversity,

several aspects are measured on which an individual differs from the rest of his or her team. Therefore, it is more likely to find an effect when studying demographic diversity than when studying gender diversity. This shows the importance of making the distinction of different types and subtypes of diversity when examining diversity.

Unexpectedly, no moderating effect of interdependence on the relationship between gender diversity in teams and team performance and team satisfaction was found. Results showed a positive direct effect of interdependence on team performance and team satisfaction. It was stated by Grant and Parker (2009) that interdependence might positively affect team performance and team satisfaction and that this advantage might be particularly the case for diverse teams. The results from the current study show evidence for the first part of their assumption but refute the idea that interdependence is particularly positive for diverse teams. From the current study we may conclude that interdependence is an advantage for team performance and team satisfaction for both homogeneous teams as well as heterogeneous teams.

The results from this study are not in line with the theories from the pessimistic point of view on diversity. According to the similarity attraction hypothesis and the social categorisation theory and social identity theory, team gender diversity leads to poorer communication and decreased personal liking, which in turn negatively affects team performance and team satisfaction. The expectations in this research were based on the premise that people would categorise their team into male-female, and create in-groups and out-groups based on gender. The results signal that this might not be the case, and that other categories are more salient in the workplace. One could argue that educational background, or work experience are much more relevant attributes in the workplace and people categorise themselves and others in categories based on these attributes. Since this research did not look into the categorisation process, this is only a

presumption. Future research could look into the categorisation process of employees in a workplace setting to study if and how this categorisation takes place, and what might influence this process. This process can be studied with the use of scales that measure self-categorisation of employees (Bergami & Bagozzi, 2000) or scales measuring social identity (Ellemers, Kortekaas, & Ouwerkerk, 1999).

Another possibility is that people derive a positive social identity from larger overarching social identities, for example team identity or even organisational identity. Identifying with one's team or organisation will prevent sub-group formation within teams or organisations (Crisp & Hewstone, 2007), and therefore the negative consequences of the categorisation process will not be as evident. Organisations can promote this by creating a strong inclusive organisational culture, where people derive part of their social identity from their organisational membership which allows people to maintain a positive social identity.

Data from the present study show that men in teams with a higher percentage of women are less prejudiced against women than men in teams with a lower percentage of women. This finding provides evidence for Allport's contact hypothesis. This hypothesis states that contact between two groups, in this case men and women, allows individuals to learn about their out-group and this will result in less prejudice towards members of that out-group (Allport, Clark, & Pettigrew, 1954). Finding only a relationship between team gender diversity and prejudice against women for men, suggests that indeed contact reduces out-group bias. Positive contact does not seem to explain this relationship, as was expected based on the findings by the study of Laurence, Schmid, and Hewstone (2018). More opportunity for contact with women, for men, reduces prejudice against women, regardless of how the contact was valued.

There are a few caveats of this study that need to be addressed. The first and most important one is that not all variables were measured on the same level. Team gender diversity was measured on a team-level and all other variables were measured on an individual-level. To overcome this problem the team-level data were disaggregated to individual-level data. By doing so the assumption of independent errors is violated. The decision to treat the team-level data as individual level data is based on three reasons. First, performing a multi-level mediation and moderation analysis would cause too much delay and is therefore out of scope for this master thesis. More importantly, aggregation of the data would have resulted in a lot of data loss. It was very important for the company that the anonymity of the participants was ensured. To accomplish maximum anonymity, the 53 teams were, in consultation with the organisation, merged into nine teams. The third reason for disaggregating the data is that when the data would be aggregated to a team-level instead of disaggregated to an individual-level, the sample size of this study would have become nine. Such a low sample size is detrimental for the power of the study. Accordingly, mostly for pragmatic reasons, the decision was made to disaggregate the data. Further research should obviously take into account the nesting of individuals in teams and collect data from more teams to overcome this methodological limitation.

The second caveat of this study that needs to be addressed is the violation of multicollinearity during analyses. This assumption was violated due to the addition of a very similar model into the equation. The percentage of women in a team (linear) and team gender diversity (curvilinear) were added into the equation. The violation of this assumption is not damaging for the analyses because only the predictive value of one of the models was taken into account when reporting the results.

Another limitation of this study is that social desirability may have influenced the results. This is due to the use of self-reported measures for all outcome variables. Social desirability results in overreporting socially desirable behaviours and underreporting socially undesirable behaviours (Gordon, 1987). This means that in the current study social desirability might have affected the self-reported prejudice against women, because prejudice is generally thought of as a socially undesirable attitude. To overcome social desirability, prejudice can be measured in a more implicit way with the use of an Implicit Association Test (IAT). In an IAT participants' implicit attitudes are measured by the strength of their evaluative associations. This averts social desirability because participants are not aware of what is measured. A weakness of the IAT is that implicit attitudes do not predict behaviour adequately, while explicit attitudes have more predictive value for behavioural intentions. The IAT measures associations that a person has rather than the extent to which a person endorses those evaluative associations (Karpinski & Hilton, 2001). Therefore, it was decided to use an explicit questionnaire to measure prejudice against women. To diminish the effect of social desirability, the anonymity of the participants was maximised by combining the 53 teams into nine teams as stated before, by keeping the purpose of the study vague, and by clearly stating the confidentiality and anonymity of the data of the participants in the informed consent.

A second limitation of the present research is the cross-sectional design of the study, which precludes causal statements. The found relationships should not be interpreted as causality. Future research may benefit of using a longitudinal design because this offers the possibility to examine causal or reciprocal relationships between team composition and team outcomes.

The current study has a few limitations regarding generalisability. The present study only included participants from one population in one context. All participants were employees of the same organisation, located in the UK. The variables are thus studied within one organisational culture, this impedes external validity and caution is needed when generalising these results to a larger population. Even though the external validity of this study is limited, considering the variables were studied in a field setting, the ecological validity of this study is high.

Despite the limitations of the present study, a few important conclusions can be drawn. Most theories about diversity in teams and organisations predict negative consequences of diversity on team performance and team satisfaction. These predictions are based on the theories from the pessimistic view on diversity (see introduction). In this study, no evidence has been found for these theories. This does not mean that the theories should be rejected but it illustrates the importance of investigating the underlying mechanisms proposed by these theories. This study showed a direct association between interdependence and team performance and team outcomes. This indicates that there might be more important predictors of team performance and team satisfaction than team gender diversity. Future research should steer away from focussing on the effects of team diversity and focus more on contextual factors that might influence team performance and satisfaction and are more feasible to be changed.

When studying diversity often broader categories of diversity are studied (e.g. demographic diversity). The discrepancies in the results of the current study and the study by Chatman and Flynn (2001) show that it is not possible to draw conclusions on the effect of specific types of diversity with the results from studies that examine the effects of a broader category of diversity. No conclusion can be drawn from a study

about the relationship between team demographic diversity and team performance and team satisfaction, about the relationship between team gender diversity and team performance and team satisfaction.

Furthermore, it is important to study not only possible organisational (economic) gain or loss as a result of team diversity, but also to study interhuman relations in the workplace as valuable in itself. Current research showed that team gender diversity is associated with less prejudice against women by men. This shows that diversity is perhaps more important for personal relationships in the workplace than for organisational outcomes.

This study signals that there are no detrimental consequences for organisations with more gender diverse teams, and it even reduces prejudice against women among men when they work in teams with a higher percentage of women. There is no longer an excuse for organizations not to take action to become more gender diverse. It is likely that contextual factors, such as interdependence, play a greater role in predicting team performance and team satisfaction than the gender composition of a team. And since participating in the labour market has such a positive impact on individuals, organizations have the moral obligation to become more gender diverse.



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## **APPENDIX A**

### **Informed Consent**

Dear participant,

Thank you for participating in my Master research on Team Diversity. Before you decide if you wish to take part, it is important for you to understand why the research is being done and what it will entail. Please take time to read the following information carefully.

The goal of this research is to investigate the relation between Team Diversity, Team Performance and Team Satisfaction.

After the survey you will be asked to provide some background information. All of your answers will be encrypted and anonymised. They will be treated confidentially and will only be used by the University of Utrecht.

The survey takes approximately 5 minutes to complete. Try not to overthink, there is no wrong or right answer. Note: it is not possible to skip any questions. For the analyses of the data it is important that all questions are answered. When you finish the survey, please click on the black arrow at the bottom of the page to send in your answers.

Participation in this study is completely voluntary and you are free to withdraw at any point.

By participating in this study, you confirm that you have read and understood this text and agree to the terms of this study.

For any questions or concerns, please contact me.

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## APPENDIX B

### Online Qualtrics Questionnaire

Q1 I identify as

- Female
- Male
- Neither

Q2 What is your age?

- Under 25 years old
- 25-35 years old
- 36-45 years old
- 46-55 years old
- 56-65 years old
- 65 years of older

Q3 What is the highest degree or level of school you have completed?

- Less than a high school diploma
- High school degree or equivalent
- Bachelor's degree (e.g. BA, BS)
- Master's degree (e.g. MA, MS, MEd)
- Doctorate (e.g. PhD, EdD)
- Other (please specify) \_\_\_\_\_

Q4 I am part of team

▼ Asset Integrity (1) ... Aberdeen Base (9)



Q5 The percentage of women in my team is

- 0-20%
- 20-40%
- 40-60%
- 60-80%
- 80-100%

*The following questions were all answered on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).*

Q6 I have to obtain information and advice from my colleagues in order to complete my work

Q7 I depend on my colleagues for the completion of my work

Q8 I have a one-person job (reverse scored)

Q9 I rarely have to check or work with others (reversed scored)

Q10 I have to work closely with my colleagues to do my work properly

Q11 In order to complete their work, my colleagues have to obtain information and advice from me

Q12 Team members are informed about the goals they should attain as a group

Q13 Team members receive feedback on the basis of their collective performance

Q14 I am satisfied with my present colleagues

Q15 I am pleased with the way my colleagues and I work together

Q16 I am very satisfied with working in this team

Q17 I enjoy the contact I have with my team members

Q18 I experience the communication within my team as mainly positive

Q19 I value the relationships I have with other team members

Q20 Our team is very competent

Q21 Our team performs the job well

Q22 Our team gets the work done very effectively

Q23 I often pick up the slack for some of my female coworkers who are less productive

Q24 The most qualified workers in my job seem to be male

Q25 I feel that women have a more difficult time handling positions of authority relative to men

Q26 Most of the women in management positions do an outstanding job (reverse scored)

Q27 I would feel less comfortable with a female supervisor than I would with a male supervisor

Q28 It seems as if some women I work with need to be more assertive to be effective supervisors

Q29 Relative to male supervisors, female supervisors seem to be less effective

Q30 We would have a more creative work environment if more women were hired (reverse scored)

Q31 Some of the members of this organisation were hired just because they are women

Q32 I feel that increasing the hiring of women can only help this organisation (reverse scored)