Proportion of women in work teams and team performance: a moderated mediation model

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Abstract

Women's representation in the workforce is increasing. However, we still do not know how, why, and when the proportion of females in work teams is related to team performance. Based on Social Role Theory and Congruence Theory, the purpose of the study was to ascertain whether the relationship between the proportion of women in work teams and team performance is mediated by team social cohesion, and whether this indirect effect is moderated by the frequency of leader-team member social interactions. Regarding methodological aspects, the study sample was composed of 178 work teams from three banks. We implemented a time-lagged design and collected data from two distinct sources (team members and team leaders) at three different time points. Our findings indicate that the proportion of women in teams was positively related to team performance via team social cohesion. This indirect effect was moderated by the frequency of leader-team member social interactions, so that it was positive and statistically significant only in teams with medium and high frequency of these interactions. This study reveals that team social cohesion is a mechanism through which the proportion of women in work teams can facilitate team performance, especially when team leaders frequently interact with their team members. The theoretical and practical implications of our findings were discussed.

Keywords Women in work teams · Team social cohesion · Team performance · Leader-team member interactions · Social role theory · Congruence theory

Women's participation in the workforce has increased in recent decades, and it will continue to rise in the coming years (Ortiz-Ospina & Tzvetkova, 2017). At the same time, increasing global competition and the need to solve complex problems, innovate, and rapidly adapt to changing environments have fostered team-based structures inside organizations, based on the assumption that teams are better equipped to face the aforementioned challenges than single individuals (Kozlowski & Bell, 2003). In order to achieve more flexibility and adaptability, organizations worldwide adopt a team-based structure (Kozlowski & Ilgen, 2006). Therefore, work teams have been considered key organizational building blocks (van Knippenberg, 2003). One of the outcomes of these two trends is that the proportion of women in work teams will grow in the coming years.

However, current organizational psychology research does not provide a clear understanding of the relationship between the proportion of women in work units (e.g., organizations, departments, work teams) and work-unit performance. The influence of team gender composition on team performance has been studied within the team gender diversity literature. Although this literature is broad, research findings about the influence of team composition on team performance are inconclusive (Lauring & Villeseche, 2019). A characteristic of this research is that most of the studies are conducted using symmetric diversity measures (e.g., the Blau index). A limitation of these measures is their non-directionality. For instance, a team with three women and seven men is attributed the same diversity score as a team with seven women and three men. Using the Blau index, the diversity score for the first team is: $1 - p_{women}^2 \cdot p_{men}^2 = 1 - [.3^2 \cdot .7^2] = 0.956$. The diversity score for the second team is exactly the same: $1 - [.7^2 \cdot .3^2] = 0.956$, and yet these teams differ in their composition and probably in their

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internal processes (Williams & Mean, 2004). Thus, to fully capture the influence of the presence of women in teams and overcome the limitation of symmetric diversity measures, we need research conducted with proportional measures of women in teams. Using this proportion, the two teams in our example can be distinguished.

Research on the relationship between the proportion of women in teams and team performance is scarce, and its results are contradictory. For instance, research focusing on women's representation on corporate boards has shown that it is positively related to financial indicators of organizational performance (Krishnan et al., 2005; Singh et al., 2001). Fenwick and Neal (2001) found that a greater number of women in teams resulted in better team performance. However, this study was done with a sample of students, limiting the generalizability of their results to samples of teams in real work scenarios. Finally, Joshi (2014), in a sample of basic science and engineering research teams composed of pre- and post-doctoral employees, did not find a significant relationship between the proportion of women in the team and team productivity. Thus, previous research on this relationship has provided inconsistent results and lacks evidence for this relationship in the context of work teams (Fenwick & Neal, 2001; Joshi, 2014; Krishnan et al., 2005; Singh et al., 2001).

This situation is worrisome because it shows that: (a) we do not know whether a sound relationship between the proportion of women in work teams and work team performance exists; and (b) we do not understand the mechanisms that may underlie and explain this relationship. Given the increasing participation of women in the workforce and the fact that, consequently, the composition of work teams is changing, investigating, and understanding the relationship between the proportion of women in work teams and work team performance is necessary for theoretical and practical reasons. From a theoretical perspective, first, we need to build knowledge consensus (Hollenbeck, 2008) about an elusive relationship. We have to ascertain whether a key feature of team composition –the proportion of women on the team- is related to a crucial outcome (team performance). Providing empirical evidence about this relationship is an initial step in building knowledge consensus about this issue. Second, to understand why the two aforementioned variables are related, we need to identify the intervening variables linking them. This process may uncover explanatory mechanisms that can improve our understanding of the relationship between the proportion of women in teams and team performance. Third, we also need to know the boundary conditions (moderators) that enhance or buffer the investigated relationship and whether they increase or reduce the intensity of this relationship. Identifying moderators will give us more nuanced and detailed knowledge about the aforementioned relationship. In fact, scholars have called for more research on contextual factors (e.g., leadership) in the relationship between team gender composition and team performance (Olsen & Martins, 2012). From a practical perspective, ascertaining the intervening variables (mediators) and moderators that play a relevant role in the relationship between the proportion of women in teams and team performance may suggest ways to increase the latter by acting on the identified mediators and moderators.

Thus, in our study, we aim to answer the following research question: how, why, and when the proportion of women in work teams is related to work team performance. To improve our understanding of this relationship, we test a moderated mediation model based on social role theory (SRT, Eagly, 1987; Eagly & Wood, 2012; Eagly et al., 2020) and congruence theory (Becker & Huselid, 1998; Nadler & Tushman, 1980). SRT posits that men and women behave differently due to different gender role beliefs or gender stereotypes (Eagly & Wood, 2012). According to female stereotypes, women are more concerned about the quality of interpersonal relationships, and they tend to take greater responsibility for establishing and maintaining interpersonal social bonds (Eagly & Karau, 2002; Eagly & Wood, 2012). However, the communal behaviors women practice at work are often invisible and devalued in organizations (Fletcher, 1999) because what constitutes good work revolves around the traditional agentic male worker (Acker, 1990). This is unfortunate because the social behaviors women tend to engage in at work (e.g., providing support, caring, and acting interpersonally) foster the necessary conditions for a work team to flourish (Mazei et al., 2015). Considering this, we chose team social cohesion as a hypothetical mediator in the relationship between the proportion of women in teams and team performance. Team social cohesion is conceptualized as shared liking or attraction among group members (Evans & Jarvis, 1980), and it refers to the nature and quality of the emotional bonds of friendship, liking, caring, and closeness among group members. Moreover, we chose to focus on team social cohesion and not on other possible variables such as a team cooperation, because SRT suggests that women have a higher tendency to establish and maintain social bonds than men (Eagly & Wood, 2012; Eagly et al., 2020), thus team social cohesion is the most appropriate team level construct to study the overall social relationships in teams. We argue that the higher the proportion of women in teams, the more accumulation of communal behavior in that team that lead to higher team social cohesion. In addition, research suggests there is a positive relationship between team social cohesion and team performance (Beal et al., 2003; Mathieu et al., 2015).

Congruence Theory (Becker & Huselid, 1998; Nadler & Tushman, 1980) posits that a work unit is more effective
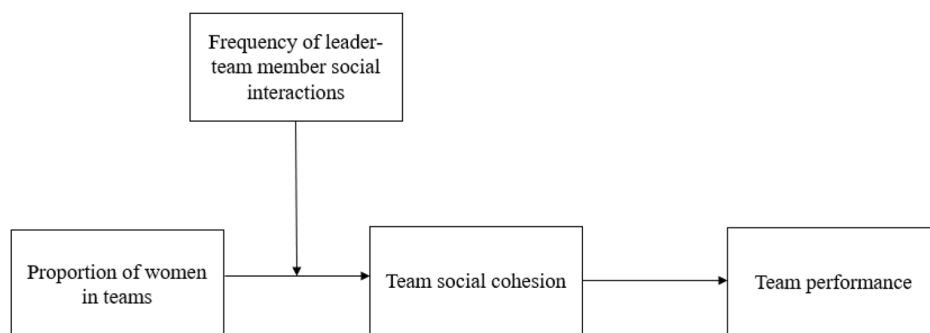
Fig. 1 *The Proposed Research Model: the Indirect Effect of the Proportion of Women in Teams on Team Performance via Team Social Cohesion and Moderated by Leader-Team Member Social Interactions*

when different elements of the unit are aligned and reinforce each other. A pivotal aspect of work units is leader behavior. Through their behavior, leaders send potent messages about what aspects are important and valuable for the work unit's functioning (Schein, 1985; Zohar & Luria, 2004). One of the key leader behavior categories consists of leader behaviors directed at maintaining close relationships with collaborators (Burke et al., 2006). We chose the frequency of team leaders' interactions with their team members as an indicator of these socially-oriented leader behaviors. This frequency sends a message about the importance a team leader assigns to social interactions in the team. When this frequency and the proportion of women in the team are both high, the former may reinforce the value of communal behaviors provided by women, directly enhancing the relationship between the proportion of women in the team and team social cohesion, and indirectly enhancing the relationship between the former and team performance.

Thus, to answer our research question of how, why, and, when a proportion of women in teams influences team performance, we tested a first-stage moderated mediation model about the influence of the proportion of women in work teams on team performance (i.e., the quality of the processes and behaviors oriented toward goal achievement; Motowidlo, 2003), mediated by team social cohesion and moderated by the frequency of leader–team member social interactions (see Fig. 1).

In our study we aimed to make several contributions to the literature. First, by establishing that the proportion of women in teams is indirectly and positively related to team performance, we contribute to building knowledge consensus about an elusive relationship that has obtained inconsistent results in previous research (Hollenbeck, 2008). Second, by identifying team social cohesion as a mechanism through which the proportion of women in teams is related to team performance. In this regard, SRT offers a theoretical framework to understand *why* the proportion of women

in teams impacts a key team state (social cohesion) and the influence of this variable on team performance. Third, in our study we aimed to uncover one of the boundary conditions (the frequency of leader-team member social interactions) that enhances the influence of the proportion of women in teams on team performance via team social cohesion. This knowledge improves our understanding about *when* the investigated relationship is more likely to appear, offering a more nuanced account of the indirect effect of the proportion of women in teams on team performance. Finally, from a practical point of view, our findings suggest several strategies that can be implemented in teams to improve team social cohesion and, ultimately, team performance.

Proportion of women in teams and Team Social Cohesion

We posit that there is a positive relationship between the proportion of women in teams and team social cohesion. The rationale underlying this relationship is based on Social Role Theory (Eagly, 1987; Eagly & Wood, 2012). According to this theory, men and women differ in affect, cognition, and behavior due to different gender role beliefs. Gender role beliefs are people's perceptions of men's and women's social roles in a certain society (Kugler et al., 2018). People form gender role beliefs via socialization and by observing how social roles are displayed in the society. Hence, people deduce gender-specific attributes and dispositions that allow men and women to perform their gender-specific behaviors. These different attributes ascribed to men and women are represented in shared beliefs about the "nature of men and women", also known as gender stereotypes (Eagly & Wood, 2012).

Stereotypes about the male role revolve around agentic characteristics that include being ambitious, assertive, competitive, and task oriented. According to female stereotypes,

women have more communal characteristics associated with being supportive, caring, warm, emotional, and interpersonally oriented (Eagly & Karau, 2002; Eagly & Wood, 2012; Mazei et al., 2015). Recent meta-analytical research shows that the attribution of communal characteristics to women, compared to men, has increased in the past 73 years (Eagly et al., 2020).

There are several mechanisms through which gender role beliefs affect individuals' behavior (Eagly & Wood, 2012; Wood & Eagly, 2010). According to Social Role Theory, first, gender role beliefs are internalized and become part of an individual's gender identity, one of the factors that guides people's behavior. Second, gender roles are considered both descriptive, identifying what people do, and injunctive, imposing what people ought to do (Cialdini & Goldstein, 2004). Therefore, gender roles trigger expectations about how men and women should behave. Moreover, these behaviors can be socially rewarded if they are consistent with the corresponding social role, or socially sanctioned if they violate gender role expectations.

Based on SRT, Eagly et al. (1981) suggest that women are more concerned about the quality of interpersonal relationships than men are, and they are more prone to care for establishing and maintaining interpersonal social bonds. In contrast, the male gender role emphasizes independence and competitive behavior, thus leading to a lower tendency to maintain social relations. Moreover, Ridgeway and Diekema (1992) argued that women display more cooperative and group-oriented behavior in group settings than men. Fletcher (1999) suggested that, due to their social role, women carry the relational responsibility and engage in relational practices in the workplace. Women engage in a relational practice called "creating a team", which refers to women's social interactions associated with building a collective (Fletcher, 1999). These ideas suggest that, in a work team setting, the higher the proportion of women in the team, the higher the interest in maintaining good and close relationships among the team members. In fact, the gender numerical composition has been considered an important predictor of team processes, states and outcomes (Kogut et al., 2014). Hence, we argue that as the proportion of women in the team increases, the communal behaviors, such as closeness, caring, and liking among team members promote team social cohesion.

There is indirect empirical evidence supporting the positive relationship between the proportion of women in teams and social cohesion. Females have been found to show a greater ability to develop and nurture relationships, sympathy, and compassion (Jolson & Comer, 1992) and maintain harmony in relationships with others (Maslach et al., 1987). Moreover, Woolley and colleagues (Bear & Woolley, 2011; Woolley et al., 2010) found that the proportion of females in groups was associated with the quality of the social interactions, as indicated by greater equality in conversational turn-taking and higher levels of social sensitivity demonstrated by the female group members. Based on these theoretical arguments and empirical evidence, we posit that the proportion of women in teams is positively related to team social cohesion.

Team Social Cohesion and Team Performance

We expect to find a positive relationship between team social cohesion and team performance. The theoretical arguments supporting this relationship suggest that when team social cohesion is high, social bonds within the team are stronger, team members get to know each other better, and improve the coordination of their tasks and activities better. All these elements facilitate successful team performance (Beal et al., 2003). In addition, because socially cohesive teams enjoy high-quality relationships among team members, they "are more willing to work together cooperatively and share a joint commitment to task accomplishment" (Mathieu et al., 2015: 715), which benefits team performance. Empirical evidence supports the positive relationship between team social cohesion and team performance. The meta-analysis conducted by Beal et al. (2003) showed that the social component of team cohesion (interpersonal attraction) had a positive mean-corrected correlation with team performance (0.20, 95% CI = 0.12, 0.28).

Considering the abovementioned theoretical arguments and empirical evidence, we expect that the proportion of women in teams will have an indirect "effect" on team performance, mediated by team social cohesion. In teams where the proportion of women is higher, team members will be more interested in maintaining good and close relationships with each other, and the number and frequency of behaviors fostering closeness, caring, and liking among team members will be higher, thus fostering team social cohesion. This latter variable, in turn, promotes coordination and cooperation among team members and increases their commitment to team task accomplishment, which enhances team performance. Therefore, we propose the following hypothesis:

Hypothesis 1 There is a positive indirect effect of the proportion of women in teams on team performance via team social cohesion, so that the proportion of women in teams is positively related to team social cohesion, which in turn is positively related to team performance.

The moderating role of the frequency of Leader-Team Member Social interactions

Congruence theory (Becker & Huselid, 1998; Nadler & Tushman, 1980) has been widely used in organizational research to explain how interactions among different factors influence work units' effectiveness. Congruence theory posits that when different aspects of a unit are aligned, they invoke synergies which lead to increased work-unit effectiveness (Becker & Huselid, 1998; Nadler & Tushman, 1980). We chose this theory because it explains how different unit-level variables can contribute to work unit performance. Our study considers two unit-level aspects (the proportion of women in the team and the frequency of leader-team member social interactions) to explain team performance. Thus, congruence theory provides an adequate theoretical framework to understand how these aspects interact and influence team performance.

When team leaders frequently talk with their team members, they are sending the message that social interactions are valued in the team and important for team functioning. When both the frequency and the proportion of women in the team are high, the former may reinforce the value and impact of the many communal behaviors women exhibit in the team (such as offering support and building and maintaining interpersonal social bonds), yielding a high level of team social cohesion. When both the frequency with which a team leader interacts with her/his team members and the proportion of women in the team are low, the leader conveys that social relationships are not regarded as valuable in the team, which, combined with the few communal behaviors performed by the low number of women in the team, will probably yield a low level of team social cohesion. Finally, according to congruence theory, when the two factors under consideration are disparate (i.e., one is high and the other is low), there is no synergy that impacts the outcome in question (i.e., team social cohesion).

Considering these arguments, we posit that the relationship between the proportion of women in teams and team social cohesion is moderated by the frequency of leader-team member social interactions. Therefore, considering the indirect effect proposed in Hypothesis 1, we also propose that this indirect effect will depend on the frequency of leader-team member social interactions. More specifically, we hypothesize the following:

Hypothesis 2 The indirect effect of the proportion of women in teams on team performance via team social cohesion is moderated by the frequency of leader–team member social interactions. This indirect effect is stronger in teams with a high frequency of leader-team member social interactions

than in teams with a low frequency of leader-team member social interactions.

Method

Sample and Procedure

The data analyzed in this manuscript were collected within the framework of a broader research project on work teams. The sample was composed of 178 work teams from three different saving banks. The analyzed data have been used in prior research to answer different research questions (González-Romá & Hernández, 2014; Le Blanc et al., 2021). The teams from the three banks showed similar characteristics in terms of size, structure, and the functions performed. The composition of the branches was as follows: one branch manager, one or two internal controllers (depending on branch size), and a few administrative employees. All the team leaders included in this study were men.

In this study, we used the definition of teams proposed by Kozlowski and Bell (2003). Therefore, the studied teams met the following criteria: (1) They were composed of two or more individuals who socially interacted (face-to-face) and were members of a bank branch that performed organizationally-relevant tasks and shared common goals and work processes; (2) Interaction among team members was needed to achieve the teams´ goals, so that there was some degree of task interdependence among team members; and (3) The bank branches had a unique identity within the organization to which they belonged (i.e., they had a specific and different name, code, and location).

The data were collected through questionnaires distributed to branch employees and filled out in collective sessions in the presence of a trained collaborator from the research team. In the case a branch member could not attend the abovementioned session, the questionnaire was personally delivered to the involved employee and collected within a few days by the corresponding collaborator. Confidentiality and anonymity of responses were guaranteed at all times. Participation in the research was voluntary, and informed consent was given verbally.

We implemented a time-lagged design in which the proportion of women in the team (the predictor) and the frequency of leader-team member social interactions (the moderator) were measured at Time 1, team social cohesion (the mediator) was measured at Time 2, and team performance (the outcome) was measured at Time 3. Thus, the hypothesized causes preceded their hypothesized consequences in time, and there was consistency between the ordering of the variables in our research model and the time point at which they were measured.

Data were collected at three different time points. The time lag between Time 1 and Time 2 was six months, and it was 12 months between Time 2 and Time 3. The time lag length was mostly determined by the organizations´ availability. However, they were long enough to allow us to observe significant relationships among the study variables over time.

At Time 1, we collected data about the proportion of women in the team from team members and data about the frequency of leader-team member social interactions from team leaders. Because common method variance can severely deflate interaction effects (Siemsen et al., 2010), we used different sources of information to operationalize the two variables involved in our hypothesized interaction term. At Time 2, we collected data about team cohesion from team members, whereas at Time 3 we gathered data about team performance from team leaders.

At Time 1, we collected data from members of 178 teams. From these teams, we selected those where all team members answered the questionnaire (i.e., teams with a 100% response rate at Time 1). The 100% response rate condition was implemented in order to have a precise measure of the teams' gender composition and the proportion of females in each team. After applying this condition, 136 teams were retained. However, three additional teams were excluded from further analyses because only one member answered the questionnaire at Time 2, and data from different team members could not be used to obtain an aggregated team score for social cohesion. Hence, the final sample in this study consisted of 133 teams. Data were gathered from 608 participants, of whom 52% were men and 48% women. Regarding the age of the subjects, 11% were under the age of 25 years old, 69% were between 25 and 45 years old, and 20% were over 45 years old. Regarding team tenure, 11% had a tenure of less than 6 months, 11% between 6 months and 1 year, 46% between 1 and 5 years, 21% between 5 and 10 years, and 11% more than 10 years. The average team size was 4.5 ($SD = 1.33$) at Time 1, Time 2, and Time 3. The range was between 2 and 8 team members at all three time points. The average response rate at Time 2 was 90%. Four leaders did not provide information about leader-team member social interactions at Time 1, and 27 leaders did not provide information about team performance at Time 3 (two of these leaders did not provide information at either time point). Thus, the final sample contained 104 teams for the analysis of the conditional indirect effect.

Measures

Proportion of women in teams

Proportion of women in teams (P_w, Time 1) was measured by calculating the proportion of female members in the study teams (P_w = number of women in the team / total number of team members).

Frequency of Leader-Team Member Social interactions

Frequency of leader-team member social interactions (Time 1) was measured by means of a 7-item scale. Team leaders were asked to respond by giving the frequency with which they talked with their team members about several work and organizational matters, such as team member relationships, team goals, and work organization in the team. This scale is an adapted version of González-Romá et al.'s (2002) team-members interaction scale. The response scale was a 5-point scale ranging from 1 (Never) to 5 (Quite frequently). A factor analysis of the seven items using the maximum likelihood extraction method yielded a single factor that explained 51.37% of the variance. All factor loadings were higher than 0.41. The reliability of this scale (Cronbach's α) was 0.84. The utilization of leaders' ratings is appropriate in this case because they are in a better position than team members to inform about their social interactions with *all* the members of the team. Team members may only have partial information about how frequently the leader interacts with each of them (Johnson et al., 2012). Moreover, the mean (3.63) and standard deviation (0.58) observed suggested that leaders' ratings were not systematically upward (or downward) biased.

Team Social Cohesion

Team social cohesion (time 2) was measured by means of a 4-item scale. Three out of four items came from Stogdill's (1965) cohesiveness scale ("In my work team, team members regard each other as friends"; "In my work team, team members work as a team"; "In my work team, team members are very cooperative with one another"). These items were selected because in the factor analysis conducted by Riordan and Weatherly (1999) in a sample of bank employees, they showed the highest loadings on cohesion (> 0.82) and the lowest loadings (< 0.25) on other factors (work-group communication and work-group identification). The fourth item (i.e., "In my work team, people feel very close") was developed by the research team to measure the closeness involved in the concept of social cohesion. Items were answered on a 6-point scale ranging from 1 (Strongly

disagree) to 6 (Strongly agree). A factor analysis of the four items using the maximum likelihood extraction method yielded a single factor that explained 84.76% of the variance. All factor loadings were higher than 0.81. The reliability of this scale (Cronbach's α) was 0.94.

Team cohesion was operationalized by aggregating team members' scores. Before aggregation, within-team agreement was assessed by means of $r_{wg(j)}$ for multi-item scales (James et al., 1993), as recommended by LeBreton and Senter (2008). A $r_{wg(j)}$ of 0.70 is considered an acceptable level of inter-rater agreement (Bliese, 2000). The 133 teams had an average $r_{wg(j)}$ value for team social cohesion of 0.88 ($SD = 0.17$).

In addition, to justify the utilization of team level scores, the Intraclass Correlation Coefficients [ICC(1) and ICC(2)] were calculated. ICC(1) shows whether there is a team-level effect on the variable of interest, and ICC(2) provides an estimate of the reliability of the team-level mean (Bliese, 2000). The ICC(1) value for team cohesion was 0.44, whereas the ICC(2) value was 0.76. Overall, the values obtained for the $r_{wg(j)}$, ICC(1), and ICC(2) were acceptable (Bliese, 2000), thus supporting the aggregation of the cohesion data to the team level.

Team Performance

Team performance (time 3) was assessed by asking branch managers to evaluate their team´s performance on a 2-item scale. Hence, our measure was a subjective measure of team performance reflecting the team leader's perceived team performance. One item was adapted from a 'group performance scale' (Jehn et al., 1999) (i.e., 'How well do you think your work team performs?') and answered on a 5-point scale ranging from 1 'very badly' to 5 'very well'. The second item was as follows: 'What is the quality of the work carried out by your team?'. Our research team has used this scale in previous published studies. Team leaders answered using a 5-point scale ranging from 1 'quite poor' to 5 'very good'. Cronbach's α for the scale was 0.85 in this study.

To assess the discriminant validity of the scales answered by the team leader (i.e., frequency of leader-team member social interactions and team performance), these scales' items were submitted to an exploratory factor analysis using the maximum likelihood extraction method and direct oblimin rotation. Results showed a two-factor solution that explained 52.1% of the total common variance (5.49), and the item loadings (which varied between 0.45 and 0.87) were on the expected factors. These results supported the discriminant validity of the involved scales.

Control variables

In this study, we controlled for the organization to which the teams belonged, team size, team tenure and leader change. We operationalized the teams´ organization membership by means of two dummy variables. Team size and team tenure were included as two control variables due to their relationship with team performance (Kang et al., 2006). Previous research findings have shown that team size may affect team dynamics and performance because it can determine the amount of available human resources and the number of within-team interactions (Brewer & Kramer, 1986; Smith et al., 1994). Moreover, team size has been found to have a negative relationship with team cohesion (Carron & Spink, 1995). Team tenure may influence team processes and outputs since it promotes learning, coordination, and control (Smith et al., 1994). In addition, team tenure has been found to positively correlate with team cohesion, in that teams that have been together longer can form stronger cohesive bonds than newly formed teams (Bartone et al., 2002). Team tenure was measured in months by asking team leaders how long their team members had been working together in their present bank branch. We also controlled whether teams had changed their leader from T1 to T3 (0. same leader, 1. new leader).

Analysis

To test Hypothesis 1 (indirect effect), we followed current recommendations of mediation methodologists (Hayes, 2017; Zhao et al., 2010). According to these authors, the main requirement for mediation is that the indirect effect of the independent variable (X, e.g., proportion of women in teams) through the mediator (M, e.g., team social cohesion) on the dependent variable (Y, e.g., team performance) must be statistically significant. Note that methodologists have seriously criticized Baron and Kenny's (1986) requirement that there must be a significant X-Y relationship for a mediation to exist (see Hayes 2009; MacKinnon et al., 2002; Rucker et al., 2011; Shrout & Bolger, 2002; Zhao et al., 2010). For instance, Hayes (2009) states the following: "I concur with others (e.g., MacKinnon et al., 2000; Shrout & Bolger, 2002) who recommend that researchers not require a significant total effect [i.e., a significant relationship between X and Y] before proceeding with tests of indirect effects" (p. 414). Therefore, to test Hypothesis 1 we tested the statistical significance of the corresponding indirect effect. Moreover, because the product of the regression coefficients involved in an indirect effect (i.e., *ab*) does not follow a normal distribution, we tested the significance of the indirect effect by means of bootstrapping (Hayes, 2009).

Table 1 Descriptive Statistics, Reliabilities, and Correlations for Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Team size (T1)	4.47	1.33	-								
2. Team tenure (T1)	24.6	36.6	0.11	-							
3. Organization (T1)-Dummy 1	0.35	0.48	0.11	−0.06	-						
4. Organization (T1)-Dummy 2	0.44	0.5	−0.15*	0.24**	−0.64**	-					
5. Proportion of women (T1)	0.47	0.25	0.02	0.01	0.29**	0.03	-				
6. Frequency of leader-team member social interactions (T1)	3.63	0.58	0.06	0.16*	−0.14	0.23**	−0.04	(0.84)			
7. Team social cohesion (T2)	4.49	0.83	−0.18*	−0.04	−0.18*	0.27**	0.16*	0.03	(0.94)		
8. Team performance (T3)	4.1	0.46	0.07	0.05	0.26**	−0.07	0.07	0.04	0.17*	(0.85)	
9. Leader change (T3)	0.29	0.45	0.08	−0.11	−0.04	−0.04	−0.14	−0.02	−0.04	−0.14	-

Note. N = 133, except for *r* for frequency of leader team-member social interactions (N = 129) and for team performance (N = 106). Reliability coefficients (Cronbach's alpha) are reported in brackets

*$p < .05$. **$p < .01$ (one-tailed)

Table 2 Results of the regression analysis to test mediation

Dependent variable/Predictors	B	SE	R^2
1. DV: Team Social Cohesion (T2)			0.12
Organization (T1)–Dummy 1	−0.17	0.2	
Organization (T1)–Dummy 2	0.29	0.19	
Team Size (T1)	−0.09*	0.05	
Proportion of women in the team (T1)	0.59*	0.29	
2. DV: Team Performance (T3)			0.10
Organization (T1)–Dummy 1	0.28**	0.1	
Proportion of women in the team (T1)	−0.07	0.17	
Team Social Cohesion (T2)	0.11*	0.06	

Note. *$p \leq .05$, **$p \leq .01$, (one-tailed). Regression coefficients are non-standardized. SE: standard errors. DV: dependent variable

The indirect effect (Hypothesis 1) and the conditional indirect effect (Hypothesis 2) were tested using SPSS and the PROCESS macro (Models 4 and 7, respectively) (Hayes, 2013). Prior to the analyses, the two variables in the interaction term were mean centered.

Considering that our hypotheses posited directional relationships derived from theory, and according to logical consistency, we performed one-tailed, a = 0.05 hypothesis tests (Cho & Abe, 2013). This practice has also been applied in the literature (Bing et al., 2007; Bruning & Campion, 2018; Valls et al., 2021). Moreover, mediation methodologists consider one-tailed tests are justified in mediation research (Preacher et al., 2010). For the sake of consistency, we reported the 90% confidence intervals for all the indirect effects.

Results

Descriptive statistics, correlations among the study variables, and reliability estimates are displayed in Table 1. Team tenure was not significantly related to team social cohesion or team performance; therefore, this control variable was excluded from subsequent regression analyses. Leader change was not significantly related with any

variable in the model, hence it was also excluded from further analysis. Team size and the two organization dummy variables correlated with team cohesion (see Table 1). Thus, they were included as controls in the regression analysis predicting team cohesion (see Table 2). The variable "Organization (T1)-Dummy 1" correlated with team performance. Therefore, we included it as a control variable in the regression analysis predicting team performance (see Table 2). Other correlations obtained showed that the proportion of women in the team was positively related to team social cohesion ($r = .16$, $p < .05$), and the latter variable was positively related to team performance ($r = .17$, $p < .05$).

Table 2 displays the results of the regression analysis. When we regressed team social cohesion on the proportion of women and the control variables, the relationship between the proportion of women and team social cohesion was positive and statistically significant ($a = 0.59$, $p < .05$). When we regressed team performance on team social cohesion, the proportion of women, and the control variables, the relationship between team social cohesion and team performance was statistically significant ($b = 0.11$, $p < .05$). Moreover, the direct effect of the proportion of women on team performance ($c = −0.07$) was not statistically significant.

To test Hypothesis 1, which proposed a positive indirect effect of the proportion of women in teams on team performance via team social cohesion, we computed the indirect effect *ab* and its 90% bias-corrected bootstrap confidence interval (CI). The number of bootstrapped samples was 5000. The results obtained were as follows: $ab = 0.06$ ($SE = 0.0461$), 90% CI = [0.0018 to 0.1468]. Considering that the indirect effect was positive, and that the 90% CI did not include zero, we determined the results obtained supported Hypothesis 1. The mediated model with the control variables explained 10% of the variance in team performance.

To test Hypothesis 2, which proposed that the positive indirect effect of the proportion of women in teams on team performance via team social cohesion was moderated by the
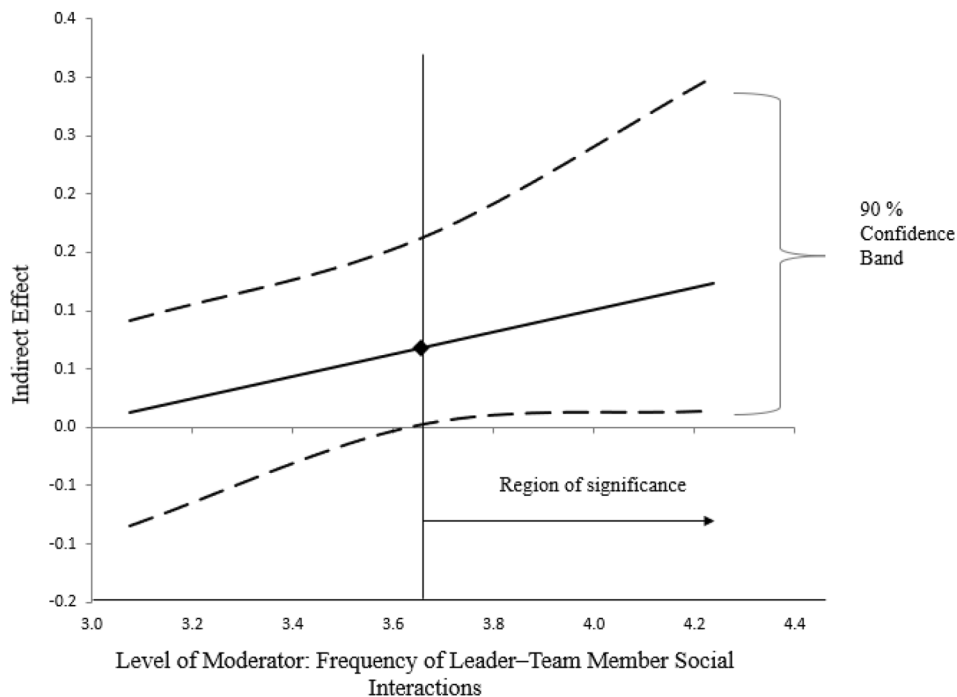
Fig. 2 *Conditional Indirect Effect of Proportion of Women in Teams on Team Performance via Team Social Cohesion as a Function of Frequency of Leader-Team Member Social Interactions*. Note: The horizontal line denotes an indirect effect of zero. The vertical line represents the boundaries of the region of significance

frequency of leader-team member social interactions, we conducted a moderated mediation analysis with PROCESS (Model 7). The Index of Moderated Mediation testing the hypothesized conditional indirect effect was statistically significant (B = 0.09, SE = 0.09, 90% CI = [0.0009, 0.2909]), indicating that the indirect effect of the proportion of women in teams on team performance via team social cohesion depended on the frequency of leader-team member social interactions. The conditional indirect effect was plotted in Fig. 2, which shows that the indirect effect was statistically significant at high and medium levels of the moderator, but not at low levels. Thus, when the moderator took the value of 1SD above its mean (+ 1SD), the indirect effect was statistically significant (B = 0.12, BC bootstrapped 90% CI = (0.0145; 0.3004)). The same thing happened when the moderator's value was its mean (B = 0.07, BC bootstrapped 90% CI = (0.0028; 0.1621)). However, when the moderator took the value of 1SD below its mean (-1SD), the indirect effect was not statistically significant (B = 0.01; BC bootstrapped 90% CI = (-0.0843; 0.0913)). Taken together, these results supported Hypothesis 2.

Discussion

The objective of this study was to examine whether there is a positive indirect influence of the proportion of women

in teams on team performance, mediated by team social cohesion and whether this indirect effect depends on the frequency of leader-team member social interactions. The results we obtained support the hypothesized indirect effect: the proportion of women in teams was positively related to team social cohesion, which in turn was positively related to team performance, and the estimated indirect effect was positive and statistically significant. Moreover, the indirect effect was moderated by the frequency of leader-team member interactions, so that it was only significant at medium and high levels of the moderator. These results have several theoretical and practical implications that we discuss below.

Theoretical implications

The first theoretical implication of our study is that we uncovered a mediator variable - team social cohesion that links the proportion of women in teams to team performance. Team social cohesion helps to understand and explain *why* the proportion of women in teams is positively (and indirectly) related to team performance. According to SRT (Eagly & Wood, 2012), men and women differ in affect, cognition, and behavior, due to the existence of different shared beliefs about the "nature of men and women" (i.e., gender stereotypes). The gender stereotype of the male role involves agentic characteristics (being ambitious, assertive,

competitive, and task oriented), whereas the gender stereotype of the female role involves communal characteristics; being supportive, caring, warm, emotional, and interpersonally oriented (Eagly & Karau, 2002; Eagly & Wood, 2012). These gender role stereotypes trigger expectations about how men and women should behave, and they are socially reinforced. Due to these expectations, compared to men, women are more concerned about the quality of interpersonal relationships, they show more interest in establishing and maintaining interpersonal social bonds, and they display more cooperative and group-oriented behavior (Eagly et al., 1981; Ridgeway & Diekema, 1992). Therefore, as the proportion of women in teams increases, team members seem to have a higher interest in maintaining good and close relationships. This enhanced interest promotes behaviors that foster closeness, caring, and liking among team members, and these behaviors increase team social cohesion. The latter variable is positively related to team performance because it improves coordination and commitment to task accomplishment (Beal et al., 2003; Mathieu et al., 2015). Thus, by uncovering the mediator role of team social cohesion, we contribute to improving our understanding of the mechanism underlying the investigated relationship, which moves organizational knowledge forward (Mathieu et al., 2008). Moreover, as Spencer et al. (2005) state, the identification of a mediator "is often an increase in knowledge and an important refinement of the theory" (p. 846).

Second, our findings confirm that the frequency of leader-team member social interactions is a boundary factor for the indirect effect of the proportion of women in work teams on team performance. This finding is important because previous research has offered contradictory results about the relationship between the proportion of women and team performance (Joshi, 2014; Niler et al., 2019). Based on Congruence theory (Nadler & Tushman, 1980), we posited that when team leaders frequently interact with their team members, they probably send a message that social interactions in the team are valued and important for team functioning. When this frequency and the proportion of women in the team are aligned and high, the former may reinforce the impact of the communal behaviors performed by women in the team, yielding an enhanced level of team social cohesion. Consequently, the indirect positive effect of the proportion of women in the team on team performance via team social cohesion is stronger when the frequency of leader-team member social interactions is high than when it is low. The fact that the results obtained supported the hypothesized conditional indirect effect suggests that the frequency of leader-team member social interactions can help to explain *when* the proportion of women in the team has an indirect influence on team performance via team social cohesion. This finding may help to build some consensus about the

conditions in which the proportion of women in the team is related to team performance. Given the results of previous studies were inconsistent (Joshi, 2014; Singh et al., 2001), our results shed some light on an elusive relationship.

Third, considering the results of previous studies on the relationship between women's representation on corporate boards and organizational performance (Cook & Glass, 2018; Terjesen et al., 2009) and our results, we suggest that the positive association between the proportion of women and performance might be observed at different levels of the organizational structure (i.e., corporate boards and work teams). Future research should explore this idea simultaneously at different levels by testing multilevel homologous models. The latter (also called homologies) are models in which a specific set of relationships among some variables is generalized across levels. Ideally, this research should include mediators. For instance, future studies could examine whether the relationship between women's representation on corporate boards and organizational performance is also mediated by team social cohesion.

Fourth, our study contributes to extending the nomological network of team social cohesion by identifying a new antecedent, namely, the proportion of women in teams. As different researchers have pointed out, we still know very little about the antecedents of team cohesion (Cooke & Hilton, 2015; Santoro et al., 2015). Only a few studies have investigated team demographic variables as antecedents of team social cohesion (e.g., Algesheimer et al., 2011; Price et al., 2002). To the best of our knowledge, our study is the first to focus on the role the proportion of women plays in work team performance, and the first to show its positive relationship with subsequent team social cohesion.

Practical implications

Our findings also have several practical implications. Based on our theoretical framework and findings, various strategies could be implemented to strengthen team social cohesion (directly) and team performance (indirectly). Our practical implications focus on communal behaviors (such as being supportive, maintaining interpersonal bonds, and displaying cooperation towards other team members) because these are the behaviors associated with the female gender role (Eagly, 1987). Moreover, they foster strong social relationships among team members (i.e., team cohesion).

Although communal behaviors are more typical among women than men, they could be enhanced across all team members, regardless of gender. Training workshops could highlight the importance of these behaviors in team functioning and use role-play to practice them. Communal behaviors could also be promoted by team leaders in different ways.

Team leaders are important role models (Grojean et al., 2004; Schein, 1985). According to Social Learning Theory (Bandura, 1986), people can learn by observing the behavior of others. Team members often perceive leaders' behaviors as a desirable standard to emulate due to the power and authority leaders have in their teams (Grojean et al., 2004). Moreover, team leaders can enhance the importance and frequency of these behaviors by providing social recognition and praise when team members perform them (Schein, 1985). More importantly, through frequent interactions with their team members, leaders can send the message that these social interactions are valuable to the team, thus enabling women in teams to boost their communal behaviors and form strong social bonds.

Hence, by enacting and reinforcing communal behaviors, team leaders can contribute to improving social cohesion within their teams and, ultimately, team performance.

Limitations and Strengths

This study has some limitations which must be taken into consideration when interpreting our results. First, we only investigated a single type of work teams (bank branches), which limits the generalizability of our results. The focus of future research should be on investigating the relationships we examined and explore whether they are observed in other types of work teams. Second, the scale we used to measure team leaders' perceived team performance was composed of two items. Previous studies have also used short scales to measure team performance (van Dyck et al., 2005; Wall et al., 2004). However, it is evident that the small number of items can limit the scale's content validity. Future studies should replicate our results using larger team performance scales. Third, all the team leaders in our sample were men. Therefore, we could not examine whether the leader's gender played a role in our study. Given that previous research has shown that teams led by women tend to be more cohesive than teams led by men (Post, 2015; Rovira-Asenjo et al., 2017), future studies should ascertain whether the leader's gender is an important boundary condition for the relationships investigated here. Fourth, we assumed that when team leaders frequently interact with their team members, they are sending the message that social interactions are valued in the team and important for team functioning. However, frequent interaction might be interpreted as a form of micromanagement and close control, which is negatively related to team members' wellbeing (Howell et al., 2005). To rule out this interpretation, we computed the correlation between the frequency of leader-team member social interactions and a measure of negative team mood[1], which is an indicator of team wellbeing. The correlation obtained was zero. This result suggested that the frequency of leader-team member social interactions was not experienced as a form of micromanagement.

Despite the study limitations, our research also has some strengths. First, we implemented a time-lagged design where we measured the study variables at three different time points which allowed us to overcome some problems of cross-sectional research. An important characteristic of our study is that the causal order of the study variables in our model was congruent with the time point at which we measured them. Although a time-lagged research design does not permit us to establish cause-effect relationships among the study variables, it allows more rigorous testing of the proposed relationships than cross-sectional designs (Schneider et al., 2005). Second, by collecting data from two different sources (team members and team leaders), we lessened concerns about common-method variance.

Conclusions

Our study contributes to our understanding of *why* and *when* the proportion of women in work teams is positively related to team performance. We uncovered a linking mechanism between these two variables (team social cohesion) and a boundary factor (the frequency of leader-team member social interactions). The insights gained from this study may be of assistance to increase our knowledge and understanding of a critical relationship in contemporary work teams.

Data Availability The data that support the findings of this study are not openly available due to restrictions imposed by the participating organizations. However, they are available from the corresponding author upon reasonable request.

Code Availability Not applicable.

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[1] We measured negative mood by using a 6-item scale tension scale (Segura & González-Romá, 2003). Team members indicated to what degree their job made them feel like each of the following adjectives in the past few weeks: tense, jittery, anxious, calm, tranquil and relaxed. Responses to the last three items were reversed. Respondents answered using a five-point scale (1. Not at all, 5. Very much). Aggregation of team members' scores at the team level was justified: within-team agreement was high enough ($r_{wg} = 0.82$, SD $= 0.21$) and ICC(1) and ICC(2) were 0.30 and 0.65, respectively.

Declarations

Conflicts of interest/Competing interests None.

Ethics approval Our study was carried out in accordance with the ethical guidelines of the Declaration of Helsinki, and according to the guidelines set by the Ethics Committee of the University of Valencia.

Informed consent Informed consent was obtained from all individual participants included in the study.

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