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When Employee Gender Diversity Benefits Collective Performance: The Importance of the Proportion of Women in Top Management Teams

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ABSTRACT

Grounded in symbolic and substantive frameworks, our study highlights how the proportion of women in top management teams (TMTs) enhances coordination among members of gender-diverse groups, leading to a higher collective performance. Our empirical investigation encompasses panel data (Study 1: 1017 observations across 306 firms over 8 years) and two group-level surveys (Study 2: 93 leaders and 391 members; Study 3: 47 leaders and 149 members), all within the context of South Korea. Consistently across our studies, we find that the indirect relationship between employee gender diversity and collective performance through relational coordination is positive and stronger as the proportion of women in the TMT increases. Notably, Study 3 reveals that it is TMTs' substantive influence (e.g., diversity-supportive practices and initiatives), rather than their symbolic influence (e.g., signaling equal opportunity for career advancement), that underpin the observed benefits of the proportion of women in TMTs. Our research highlights the pressing importance of advancing the proportion of women in top leadership positions.

1 | Introduction

The path to fully harnessing the benefits of gender-diverse work groups is fraught with complexities. While gender-diverse work groups can benefit from richer knowledge, greater flexibility, and adaptability, they may also experience challenges associated with interpersonal conflicts and subgroup divisions. Reflecting such a tension, empirical studies have shown inconsistent effects of gender diversity on collective performance, defined as the overall assessment of how effectively a group of employees collaborates to enhance productivity outcomes (Devine and Philips 2001; Kim and Ployhart 2014; Shaw et al. 2011). Collective performance arises from the interactions among group members, not merely from summing individual contributions (Hausknecht and Holwerda 2013). The observed effects of gender diversity on collective performance are quite mixed with positive, negative, and non-significant findings (for the details of these studies, see Supporting Information: Section A), which underscores the need to delve deeper into the "when" and "why" of diversity's effects (Bernstein et al. 2020; Fine et al. 2020; Roberson, Holmes et al. 2017).

In this study, we investigate the dual implications of the proportion of women in top management teams (TMTs)[1]—both its substantive and its symbolic effects—on facilitating successful coordination among gender-diverse group members and

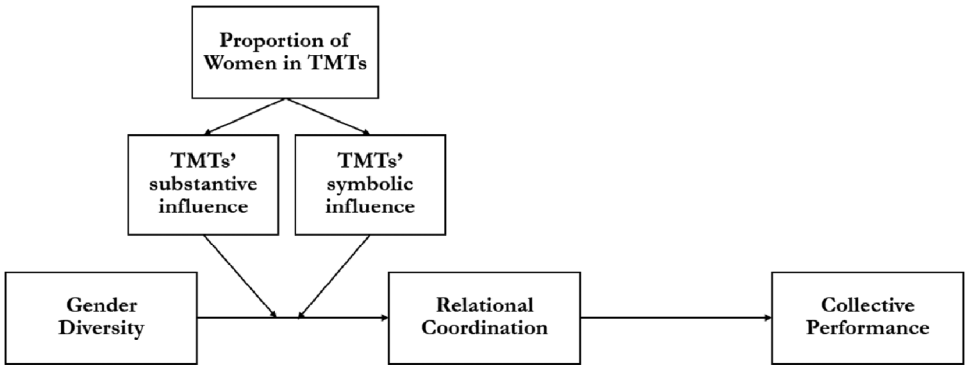

FIGURE 1 | Theoretical model.

subsequent collective performance. As key figures within the organization, the inclusion of female top managers not only catalyzes diversity-supportive initiatives (Ali and Konrad 2017; Dwivedi et al. 2023; Guldiken et al. 2019) but also embodies symbolic value (Broome and Krawiec 2008; Connelly et al. 2025; Reinwald et al. 2023). Through the dual pathways of substantive and symbolic influences, the proportion of women in TMTs enables gender-diverse groups to operate at their fullest potential, thereby driving the collective success of the group. The conceptual framework is depicted in Figure 1.

The present study advances the literature in meaningful ways. First, the integration of both substantive and symbolic perspectives departs from previous research that has addressed these effects in isolation (for symbolic influence, see Bear et al. 2010; Broome and Krawiec 2008; Connelly et al. 2025; Iseke and Pull 2019; Madera et al. 2019; for substantive influence, see Ali and Konrad 2017; Baker et al. 2021; Chan-Serafin et al. 2023; Glass and Cook 2018; Gould et al. 2018) and offered limited insights into how symbolic effects compared to the substantive initiatives undertaken by top managers. Our use of the symbolic and substantive frameworks provides a holistic understanding that informs scholars and policymakers. In doing so, our research bridges macro- and micro-perspectives on gender diversity and highlights an integrative view on gender diversity. Given the substantial interdependence between top managers and employees in achieving collective success (Heyden et al. 2017; Lee and Miller 1999; Recendes et al. 2024), understanding how gender composition across organizational levels generates synergies to enhance collective performance is essential.

Second, this research helps address existing ambiguities in the literature concerning the effects of gender composition on collective performance (see Roberson, Ryan et al. 2017 for a review). As Bernstein et al. (2020, 397) noted, "the consistent discovery of inconsistent findings suggest that theory must incorporate mediating processes and moderating factors." We add clarity to the literature by theorizing and testing "when" (proportion of women in TMTs) and "why" (relational coordination) gender diversity impacts group performance. In light of the rise of group-based work systems and the growing need for interdependent work environments (Mathieu et al. 2008), it becomes crucial to understand the influence of diversity on group dynamics (Apesteguia et al. 2012; Nishii 2013; Roberson et al. 2024). This contribution not only propels theoretical discussions forward but also provides practical insights for improving collective performance through strategic consideration of gender composition at work.

Finally, our focus on the South Korean context provides a novel contribution by examining gender diversity dynamics in a non-Western setting. Klarsfeld et al. (2019) noted that "diversity research are historically rooted in "the West"" (694) and "voices from Asia and Africa rarely find their way into internationally acknowledged outlets" (695). Sparkman (2019, 173) also noted, "research and practice in the context of marginalized communities, and non-Western countries, is crucial to broadening the scope of diversity and inclusion." The context of South Korea offers a unique lens through which to understand the impact of gender diversity in the workplace, given its notable gender gaps and lack of female members in TMTs (Cho 2018; Kim and Cho 2018; Lee 2022; Park et al. 2022). In such a setting, articulating and showcasing the positive impact of the proportion of women in senior leadership holds broader implications. If effective in South Korea, it suggests that the proportion of women in TMTs could be beneficial in other contexts facing similar gender equity challenges (e.g., Catalyst 2022; Credit Suisse 2021). The case of South Korea could provide a potent model for underscoring the strategic value of enhancing the proportion of women in TMTs as a means to realize the performance benefits of a gender-diverse workgroup.

2 | Theory and Hypotheses

Research shows that the relationship between gender diversity and performance is complex and nuanced, not straightforward. Two contrasting perspectives exist regarding how gender diversity influences performance. On the one hand, scholars suggest that gender diversity can increase the range of available skills, perspectives, knowledge, and social networks. Studies find that firms with gender-diverse workforces tend to be more effective and innovative (Herring 2009; Richard et al. 2004; Yang and Konrad 2011). Specifically, when employees view diversity as valuable and beneficial for collective outcomes, they are more likely to collaborate and work together (Li et al. 2021; Seong et al. 2015). On the other hand, an opposite perspective posits that gender diversity evokes more emotional and personal conflicts given the likelihood of intergroup bias and the human tendency for similarity-attraction (Byrne et al. 1971). Consistent with this

perspective, studies show that the benefits of gender diversity can be offset and that gender diversity has negative or null impacts on performance outcomes (Ali et al. 2015; Frink et al. 2003; Herring 2009; Richard et al. 2006; Roh and Kim 2016; Sacco and Schmitt 2005; Zhang 2020). Along similar lines, TMT-level research has also shown inconsistent findings regarding the impact of female representation in TMTs on organizational outcomes (Dezsö and Ross 2012; Hoobler et al. 2018; Jeong and Harrison 2017; Krishnan and Park 2005; Krishnan and Parsons 2008; Perryman et al. 2016; Roberson et al. 2024; Welbourne et al. 2007). Overall, empirical studies on the main relationship of gender diversity with performance are inconsistent both at the employee and TMT level. Thus, we do not make predictions about its main effects, but we proceed to examine an important contingency factor and a mediating mechanism to understand when and why gender-diverse groups lead to collective performance.

Successful coordination has been suggested as the central topic of research on diversity (Bernstein et al. 2020; Bolton et al. 2021; Heaphy et al. 2018; Van Knippenberg et al. 2004). As an indicator of successful coordination among employees, we focus on relational coordination as an overarching construct that captures high-quality interactions in the workplace. Our study is informed by diversity research that highlights an integrative view on workplace interactions in order to fully uncover the diversity effects (Bernstein et al. 2020; Roberson, Holmes et al. 2017; Van Knippenberg et al. 2004). Defined as "coordinating work through relationships of shared goals, shared knowledge, and mutual respect" (Gittell 2006, 74), relational coordination essentially captures high-quality interactions (Carmeli and Gittell 2009; Gittell 2002). Relational coordination incorporates key elements of successful coordination (e.g., shared goals, shared knowledge, and mutual respect) and has been found to predict various forms of positive interactions at work, including psychological safety (Carmeli and Gittell 2009), reciprocal learning (Noël et al. 2013), confidence in collaboration, the experience of social support (Albertsen et al. 2014; Havens et al. 2018; Naruse et al. 2013), and reduced conflicts and strikes (Ekwueme 2018). Thus, it is suitable and comprehensive enough to capture the quality of interactions, which can be drivers of improved collective performance.

We suggest that gender-diverse group members will achieve higher levels of relational coordination and enhance collective performance when there is a greater proportion of women in TMTs. This assertion is anchored in both the substantive and symbolic effects of the proportion of women in TMTs (Connelly et al. 2025; Dasgupta and Asgari 2004; Hambrick et al. 1996; Lau et al. 2023; Ma et al. 2022; Recendes et al. 2024; Roberson et al. 2024).

2.1 | Substantive Effects of the Proportion of Women in TMTs

The perspective on the substantive impact of top managers is grounded in the literature spanning strategic human resource management (SHRM) (Arthur et al. 2016), diversity management (Glass and Cook 2018; Roberson et al. 2024), and the strategic decision-making processes of upper echelons (Certo et al. 2006; Simons et al. 1999). We propose that an increased proportion of women in TMTs helps organizations take substantive actions to promote diversity and inclusion by enacting diversity-supportive practices, policies, and programs. These initiatives specifically aim to alleviate the systematic inequalities in hiring, promoting, and compensating employees of different genders (see Amis et al. 2020 and Nishii et al. 2018 for a review). This is primarily because female top managers, who have often experienced gender disparities throughout their careers, are more likely to have both the motivation and the authority to drive significant changes that enhance workplace diversity and inclusion. Indeed, research has shown that organizations with more women in managerial positions are inclined towards gender-inclusive organizational practices, leading to tangible outcomes such as a reduction in gender segregation (Guldiken et al. 2019; Stainback et al. 2016) and in the wage gap (Joshi et al. 2015), and the adoption of minority-friendly HR policies (Cook and Glass 2016).

The implementation of gender-inclusive policies and programs, often championed by female top managers, plays a pivotal role in establishing more equitable social standing for men and women within organizations. Indeed, gendered allocations of roles and responsibilities have long persisted within and across functional teams and organizational hierarchies, often implicitly or explicitly segregating women and men into distinct social positions and work roles (e.g., Cardador 2017; Chan and Anteby 2016; Hirsh 2009; Martin-Caughey 2021). Implementing active non-discriminatory practices, such as fair performance review, "equal pay for equal work" policy, and diversity training, increases the likelihood of women and men being assigned and prepared for roles based on their capabilities, not on their gender. These changes help challenge the notion of implicit status differential between male and female employees (Ashcraft et al. 2012), promoting greater mutual respect and openness in cross-gender interactions (Gloor et al. 2022; Goncalo et al. 2015; Lee et al. 2018).

We also propose that the explicit adoption of gender-inclusive practices and policies at the top leadership level motivates lower-level managers to explore and implement gender-inclusive management styles (e.g., Boehm et al. 2014; Reskin 2000). Managers are likely to consciously adapt their management styles and adopt approaches rooted in gender equity values when assigning roles and evaluating the performances of their subordinates, striving to enhance fair treatment across all gender groups (Virick and Greer 2012). Such implementation of gender-inclusive practices by managers lays the groundwork to establish norms for interpersonal communication practices and coordination tactics between members of different genders.

2.2 | Symbolic Effects of the Proportion of Women in TMTs

Scholars have examined not only TMTs' substantive roles in adopting important organizational practices but also their symbolic roles in shaping employees' perceptions and views about the organization. These perspectives are highlighted in research drawing from employee sense-making (Roberson and Stevens 2006), the stakeholder perspective on upper echelons (Recendes et al. 2024), and signaling theory (Connelly et al. 2025; Shin and Gulati 2011). We propose that employees attach meaning to gender compositions of TMTs beyond the TMTs' actual decisions or actions (Broome and Krawiec 2008; Hambrick and Pettigrew

2001; Smircich and Morgan 1982; Taj 2016). Indeed, TMTs are highly visible and influential, and the organization is often construed as a reflection of its top managers (Hambrick and Mason 1984; Wright et al. 1995). Promoting women to executive roles can signal that the organization is genuinely striving to create gender-inclusive career opportunities (Kossek and Zonia 1993).

We suggest that the greater presence of women in TMTs symbolizes the firm's dedication to ensuring equitable career advancement, showcasing that the firm is prepared to "walk the talk." This signal is deemed especially powerful in contexts where the career advancement opportunities for women are notably restricted, substantiating a pivotal shift towards enhancing opportunities for traditionally marginalized groups (Allen et al. 2008; Iseke and Pull 2019). Scholars concur with this view by noting that "the presence of women in top management might provide evidence for equal employment and career opportunities" (Iseke and Pull 2019, 1115) and can send "a signal that a company is aware of and endorses extant progressive norms of nondiscrimination and fair equality of opportunity" (Shin and Gulati 2011, 1026). In particular, the signal of equal career opportunities increases female employees' confidence that feminine insights and skills are appreciated by the organization (Martins and Parsons 2007). This recognition nurtures a sense of belonging and career aspiration among female employees (Bolinger et al. 2018; Rocha and Van Praag 2020; Swann et al. 2000) and encourages them to express their own ideas and true personalities rather than suppressing them (Nishii 2013). Such a shift in attitudes helps women feel positive about actively engaging with cross-gender interactions and presenting prosocial behaviors towards others (Colquitt and Zipay 2015; Dreher and Dougherty 1997; Vial et al. 2018), thereby contributing to group coordination.

Furthermore, a higher proportion of women in TMTs motivates male employees to build constructive relationships with their female colleagues. Past research has shown that a work environment embodying diversity-inclusive values allows both male and female members to feel a sense of belonging to the organization and connectedness among group members (cf. McKay et al. 2009; Nishii 2013). Similar to female employees, male employees view a higher proportion of women in TMTs as a signal that the firm values feminine qualities as much as those of men (Dasgupta and Asgari 2004; Lau et al. 2023; Leicht et al. 2014). This understanding leads male employees to adopt a more positive perspective in evaluating their female colleagues' unique characteristics and working styles (Townsend et al. 2024; Warren and Bordoloi 2023). Consequently, they become more willing to acknowledge female contributions to the team and support their perspectives. Male employees may also perceive that their female colleagues are more likely to stay with the organization longer due to increased career advancement opportunities. This view enhances male employees' intentions to develop high-quality and long-term oriented work relationships with female employees (Moser and Branscombe 2022). In summary, we argue that the proportion of women in TMTs signals a firm's genuine intention to value a diverse workforce equally, thereby fostering positive attitudes among members of both genders in improving group coordination (Herring 2009; Yang and Konrad 2011).

2.3 | Dual Pathway: Substantive and Symbolic Effects of the Proportion of Women in TMTs

We posit that a higher proportion of women in TMTs significantly shapes relational coordination within gender-diverse groups through both substantive and symbolic effects. Next, we elaborate on how these effects interact with low and high levels of group gender diversity.

In the case of low gender diversity in groups, two scenarios emerge. The first scenario involves groups predominantly consisting of male employees (e.g., 70% or above). We suggest that relational coordination of male-dominated groups may not be meaningfully affected by varying proportions of female top leaders. Male-dominant employee groups are likely to have established patterns of masculine interactions, where members assess one another based on their ability to exhibit traditionally masculine traits, such as competitiveness and dominance (Berdahl et al. 2018; Colarelli et al. 2006). Although such expectations may seem to facilitate prompt and efficient decision-making, they undermine the overall level of inclusivity and mutual respect among members, as members focus on demonstrating individual achievements and asserting dominance (Dabbs 2000; Detjen et al. 2024; Savicki et al. 1996). We suggest that this established interactional pattern would persist even under a higher proportion of female top managers. While the substantive and symbolic influence of female top managers may encourage minority female members to take charge and engage more actively with their colleagues, majority male members are likely to have much less motivation to do the same. Male employees may prefer to sustain the masculine interactional patterns, as they view these top-down initiatives as challenges to their majority status (e.g., Hideg and Ferris 2014). They are likely to stay indifferent or even resist changing their existing interaction patterns to accommodate minority female members.

The second scenario of low employee gender diversity occurs when groups are predominantly composed of female members. Similar to the case of male-dominant employee groups discussed earlier, we propose that the level of relational coordination in female-dominant employee groups is not necessarily influenced by varying proportions of women in the TMT. As noted previously, a higher proportion of women in TMTs can facilitate the implementation of practices and policies that support women's career advancement and reinforce the perception that women are valued organizational members. However, this potential advantage may not always translate into positive outcomes for collaboration within female-dominant employee groups and may inadvertently reinforce gender stereotypes, fostering unintended dynamics. Indeed, Steffens et al. (2019) found that female-dominant TMTs can perpetuate negative stereotypes about women leaders because such an environment heightens the salience of gender for employees. Male employees may particularly resist these settings, perceiving their workplace as atypical or challenging to navigate.[2] This resistance can in turn undermine the formation of high-quality relationships and disrupt collaborative patterns. Moreover, research suggests that, compared to gender-diverse groups, groups dominated by a single gender tend to exhibit negative interactional patterns rooted in the norms and behaviors typical of that gender.

Just as male-dominated workplaces are likely to exhibit overt competitiveness and aggression, female-dominated workplaces might be characterized by indirect aggression (Lee et al. 2018). This type of aggression, which includes behaviors intended to harm others without direct confrontation—such as social exclusion (Archer 2004; Griskevicius et al. 2009; Österman et al. 1998)—can be detrimental to relational coordination. As a result, high-quality relationships in female-dominated groups may not necessarily benefit from substantive and symbolic effects coupled with higher proportions of female top leaders.

When examining high group gender diversity (approaching a 50-50 male-female ratio), two distinct scenarios emerge at the lower and higher proportions of female top managers.[3] The first scenario involves gender-balanced employee groups under the TMTs with a lower proportion of female executives. In this context, employees recognize not only the lack of egalitarian policies and practices but also the absence of organizational commitment for equal career advancement (Lau et al. 2023). Without such substantive and symbolic efforts to foster mutual respect and trust between male and female employees, the gender-based social hierarchy and segregation within the organization are more likely to persist (Roberson and Stevens 2006). This results in the employees having a lower sense of belonging and a reduced willingness to engage fully with other group members. Consequently, high-quality interactions among group members are less likely to develop.

Conversely, when the proportion of women at the TMT level increases, thereby bringing the gender composition at the TMT level somewhat closer to parity, gender-diverse groups are more likely to foster high-quality interactions among all members. In this scenario, female top managers play dual roles: they act as endorsers and change agents promoting gender-inclusive efforts (substantive influence; Dobbin et al. 2011) while also signaling that the organization values women's contributions equally to men's (symbolic influence; Iseke and Pull 2019). These combined effects place a greater emphasis on valuing diverse perspectives and interaction styles regardless of gender (Lau et al. 2023; Townsend et al. 2024). In such an environment, employees in gender-diverse groups feel empowered to express and validate their identities without fear of exclusion. Both male and female employees perceive more trust in cross-gender relationships (Gómez et al. 2009), enhancing overall feelings of connectedness among team members (Jackson et al. 2003). Research indicates that under inclusive contexts, both majority and minority members engage in more cooperative and inclusive behaviors (Apesteguia et al. 2012; Lau et al. 2023; Lee et al. 2018; Moser and Branscombe 2022; Ortmann and Tichy 1999; Williams and Polman 2015). Such increased cooperation and inclusivity significantly enhance relational coordination within groups. We posit that the highest levels of relational coordination will occur under conditions of high employee gender diversity coupled with a high proportion of women in TMTs. This optimal scenario results from the combined substantive and symbolic influences that collectively demonstrate the firm's commitment to diversity and inclusion.

Hypothesis 1. *The proportion of women in the TMT moderates the relationship between employee gender diversity and relational coordination such that the relationship is positive and stronger as the proportion of women in the TMT increases. This moderating effect is mediated by substantive influence (Hypothesis 1a) and symbolic influence (Hypothesis 1b).*

2.4 | The Mediating Role of Relational Coordination

Next, we hypothesize the main effect of relational coordination on collective performance. Relational coordination plays a pivotal role in various group processes, with particular importance in contemporary organizational environments where evolving workplace norms highlight greater collaboration and adaptability (see Bolton et al. 2021 for a review).

We propose that higher levels of relational coordination within groups are associated with higher collective performance for two reasons. First, groups with high-quality interactions among their members tend to have effective communication patterns, enhancing collaboration efficiency and expediting important group decision-making. Supporting this notion, past research has widely shown that relational coordination is positively related to favorable work outcomes such as service quality (e.g., Gittell et al. 2008), cost efficiency (e.g., Alvarez 2014), and profitability (e.g., Siddique et al. 2019). Second, relational coordination nurtures a supportive work environment where members generally respect one another. Such a climate of mutual respect allows employees to feel valued within the organization, leading to higher job satisfaction and commitment to their teams and organizations (e.g., Havens et al. 2018). Such positive attitudes toward their colleagues are likely to facilitate work engagement (Havens et al. 2013) and problem solving (Bozan 2017), which contribute to collective performance.

One may argue that relational coordination can unexpectedly foster groupthink and force convergence in thought patterns within groups, potentially undermining group performance. This concern aligns with prior research suggesting that greater cohesion might engender pressure to conform and deindividuation (Rovio et al. 2009). However, we posit that relational coordination, by virtue of its multifaceted nature encompassing shared goals, mutual respect, and shared knowledge, transcends mere social cohesion. While we acknowledge the potential risks associated with excessive cohesion, we argue that relational coordination, with its emphasis on respectful, informed, and goal-oriented interactions, acts as a safeguard against the pitfalls of groupthink. It promotes a culture where diversity of thought is valued and critical examination is encouraged (Carmeli and Gittell 2009). Taken together, we further hypothesize that the beneficial indirect effect of workgroup gender diversity on collective performance, facilitated through relational coordination, is amplified as the proportion of women in TMTs increases.

Hypothesis 2. *Relational coordination is positively associated with collective performance.*

Hypothesis 3. *The proportion of women in the TMT will moderate the indirect relationship between employee gender diversity and collective performance via relational coordination such that the indirect relationship will be positive and stronger as the proportion of women in the TMT increases.*

3 | Research Overview

We conducted three studies within the context of South Korea: a panel data analysis with 1017 observations from 306 firms over an 8-year period (Study 1) and two group-level surveys involving 93 leaders and 391 members (Study 2), and 47 leaders and 149 members (Study 3). Study 1 offers a preliminary examination of our theoretical model at the firm level by conceptualizing the firm as a large-scale group. While this approach may not provide a direct test of our theoretical model that is focused on group-level phenomena, it is justifiable within the multilevel framework (Klein and Kozlowski 2000; Morgeson and Hofmann 1999). Specifically, the composition model posits that the aggregated observations at the high level may reflect the lower-level phenomena (Klein and Kozlowski 2000; Morgeson and Hofmann 1999), thereby supporting the ecological validity across levels based on the notion of multilevel homology (Guzzo and Dickson 1996; Oh et al. 2015; Pak and Kim 2018). In this view, collective performance can be operationalized at both firm and group levels.

Moreover, we define collective performance as the degree to which a group of employees effectively collaborates to achieve productivity outcomes. We capture collective performance in two distinct ways in our study using an objective measure of labor productivity (Study 1) and a subjective measure of group performance (Studies 2 and 3). Labor productivity, which assesses how efficiently labor input (i.e., the number of employees) is converted into output (i.e., sales), is well-aligned with this definition. Specifically, labor productivity "captures the efficiency of a workforce to produce output" (Kim and Ployhart 2014, 368), "represents the effectiveness of employees' involvement in business operations" (Kang et al. 2024, 6), and is "less influenced by factors external to the firm" (Kim and Ployhart 2014, 363). Labor productivity has been widely used in SHRM studies as an objective indicator of collective performance (e.g., Huselid 1995; Konrad and Mangel 2000; Ployhart et al. 2009; Shaw et al. 2005; Siebert and Zubanov 2009). In Studies 2 and 3, we supplement this objective measure with survey-based measures of collective performance, which directly capture employees' assessments of their group's collective effectiveness (Drach-Zahavy and Freund 2007; Shaw et al. 2011). This triangulation enhances the robustness of our findings.

It is noteworthy that Studies 2 and 3 focus on group-level dynamics. To capture TMT gender composition, we employed managers' reports, acknowledging that such measures may be subject to human memory biases. However, we took several steps to mitigate concerns about accuracy. In Study 2, we targeted managers enrolled in executive education programs (e.g., EMBA programs and executive leadership courses) at a top-ranked, large university in South Korea. Given their substantial organizational experience, these participants are likely to have reliable knowledge of their TMT composition. In Study 3, where the sample included managers from a broader range of workplaces, we explicitly asked participants to confirm the accuracy of their reported TMT gender composition. None of the respondents indicated that their responses were completely incorrect. Notably, given the scarcity of women in executive roles, their promotion to such positions is a salient event—one that employees are likely to notice. While we recognize that human memory is not infallible, our reliance on manager-reported measures was a pragmatic choice necessitated by the constraints of data collection in Studies 2 and 3. This approach aligns with prior research that has used manager reports to assess executive characteristics (e.g., Kauppila 2016; Kim et al. 2021; Ou et al. 2014; Ou et al. 2017).

In Studies 2 and 3, we use group leaders' reports of top management gender composition, making the proportion of women in TMTs functionally a group-level construct in our analyses. We believe the potential nesting of data is minimal. In Study 2, we targeted managers enrolled in executive education programs. To protect participants' privacy and anonymity, we did not collect firm affiliations or other identifying details, which limits our ability to determine whether groups were nested within the same firms. However, executive education programs are typically designed to attract participants from a diverse range of firms, as organizations often send their managers to foster new networks, and they rarely assign multiple managers to the same executive development programs. This diversity minimizes the likelihood of significant nesting. In Study 3, we intentionally targeted managers from diverse companies by leveraging personal contacts to recruit participants.

Overall, each study possesses unique strengths and limitations, and we aimed to leverage the strengths of one study to mitigate the limitations of another (McGrath 1981). Our use of multiple samples and study designs can support the robustness of our findings (Tsang and Kwan 1999). We guided our decision for study design and data analyses by referring to prior works (Chatterjee and Hambrick [2007] and Quigley and Hambrick [2012] for the panel data analysis, as well as Lee et al. [2018] and Tai et al. [2022] for the group-level studies). To ensure clarity and transparency, Supporting Information encompasses comprehensive resources.[4]

4 | Study 1

4.1 | Data Sources and Sample

The sample consisted of a panel of Korean firms over 8 years (2010–2017). We obtained the data from the Human Capital Corporate Panel (HCCP) survey (for more examples of using HCCP data, see Shaw et al. [2013], and Kim and Ployhart [2014]).[5] HCCP is a biennial nation-wide survey conducted by the Korea Research Institute for Vocational Education and Training, a public research institute specializing in human resources (HR) development. HCCP data were collected using stratified random sampling based on industry, firm size, and market listing type to include the samples of for-profit and public firms with more than 100 employees. In order to ensure the accuracy of the responses, the HCCP survey was completed by the managers with relevant expertise. For example, HR managers reported the number of male and female members in TMTs, the total number of employees and their gender composition, union influence, and HR practices. Employees reported relational coordination within the firm. Strategy managers reported firms' current strategies. The HCCP data also included accounting information drawn from the financial statements of the company. We further utilized an additional data source to obtain industry-level data. We obtained data from the Survey of Business Activities, conducted annually by Statistics Korea (KOSTAT). KOSTAT is a division

of the Ministry of Economy and Finance that conducts various national-level surveys. The Survey of Business Activities includes general managerial information from *all* Korean firms with 50 employees or more whose total capital is over $300 million. We used accounting information from this data to construct industry-level profitability. Our initial sample consisted of 317 companies across 5 survey waves (i.e., 1585 observations). After eliminating the observations containing missing values, the final sample comprised 1017 observations from 306 companies (on average, firms participated in the survey 3.3 times during the period).[6]

4.2 | Measures

4.2.1 | Employee Gender Diversity

HR managers reported the gender composition of employees. We used Blau's (1977) diversity index to measure workforce gender diversity. This was computed as $1 - \Sigma pi^2$, in which pi is the percentage of employees in the *i*th category. The index can vary between 0 and 0.5, with values close to 0.5 indicating higher diversity and values of 0 indicating lower diversity.

4.2.2 | Proportion of Women in TMTs

The HR managers provided information on the number of female members as executive-level managers. We employed the proportion of female members in TMTs (Mean = 0.03, SD = 0.08; min = 0, max = 0.67), defined as the number of women in the TMT divided by the total number of TMT members. Proportions are often used to measure the representation of women in the upper echelons since there are so few of them (Francoeur et al. 2008; Lyngsie and Foss 2017; Oh et al. 2018; Wu et al. 2022; Sieweke et al. 2023).

4.2.3 | Relational Coordination

We referred to Carmeli and Gittell (2009) and Lee and Kim (2020) and utilized five items to capture relational coordination among employees. It is important to acknowledge that we used the preexisting items in the panel data to approximate the core tenet of relational coordination (for the scale validation process, see Supporting Information: Section C). The items are "In our company, we have positive inter-departmental communications," "In our company, employees trust one another," "In our company, employees talk freely to their superiors about their opinions," "In our company, harmony and collective identity are valued," and "In our company, employees are informed about the overall company issues." Responses were measured with a 5-point Likert scale from (1) *completely disagree* to (5) *completely agree*. A total of 25,475 employees (on average, 83.3 employees per firm; min = 1, max = 240) participated in this survey over the 8 years of data collection.[7] The principal axis factor analysis showed that the five items loaded onto one factor (eigenvalue = 2.26), thereby justifying the use of the index scale (Fabrigar et al. 1999). The Cronbach's alpha was 0.85. We computed rwg, the level of within-group agreement, and two intraclass coefficients: ICC(1), which is the proportion of variance in the variable of interest that is attributable to group membership, and ICC(2), which provides an estimate of the reliability of the group means (Bliese 1998). The mean $r_{wg(j)}$ was 0.91. The ICC(1) and ICC(2) for the scale were 0.11 and 0.91, respectively, which justified the firm-level aggregation. Note that cutoffs for these metrics are inherently arbitrary. Brown and Treviño (2006) reported ICC(1) and ICC(2) values as low as 0.09 and 0.23, respectively, while Schneider et al. (1998) found an average ICC(1) of 0.09 and an average ICC(2) of 0.47. Also, ICC(2) values are influenced by group size. As for $r_{wg(j)}$, the commonly recommended threshold is 0.60 (James 1982; Schneider et al. 1998).

4.2.4 | Collective Performance

We used an objective measure of collective performance at the firm level, namely, labor productivity (a ratio of firm operating revenue to the total number of full-time employees) (Datta et al. 2005; Kang et al. 2024; Kim and Ployhart 2014; Oh et al. 2015). The firm operating revenue (i.e., sales) was measured in Korean monetary unit (one million won = approximately $1000). The objective firm-level collective performance data were lagged 1 year (time $t + 1$) compared to all the predictors (time t). As supplemental analyses, we further tested firm profits as an alternative measure of firm performance. The results were consistent and are available in the Supporting Information: Section B.

4.2.5 | Control Variables

Guided by SHRM research (Datta et al. 2005; Han et al. 2019; Huselid 1995), we controlled for industry, firm, HR, and union-related variables to rule out alternative explanations for our findings. To begin, at the industry level, we controlled for industry levels of profitability (i.e., the average return on assets within the industry; Marquis and Tilcsik 2016) as macro business environments that influence collective performance. Second, as for a firm characteristic, we controlled for the logarithms of firm sales as a representative indicator of firm size because it influences economies of scale and coordination among employees (Hutzschenreuter and Horstkotte 2013). We further included the firm's current strategy, namely, whether the firm was pursuing cost-savings or differentiation and growth (Porter 1985). This was measured using a dummy variable (1 = cost-savings, 0 = differentiation; differentiation is conceptualized as the firm's focus on new product development and quality enhancement). Third, we controlled for HR practices (i.e., workforce planning, training and development planning, profit-sharing, feedback systems, and information systems; Han et al. 2019). We created an additive index of HR practices by summing the five items (1 = *the presence of each HR practice* and 0 = *the absence of each HR practice*). Finally, we controlled for a union-related characteristic of the firm (Shaw et al. 2013). Specifically, we used the degree to which the union influences issues that significantly affect employees, such as reorganization, restructuring, and employment adjustment (0 = *no union*, 1 = *union has almost no influence on these issues*, 2 = *union tends to be involved in discussions about these issues*, 3 = *this company has to reach an agreement with the union regarding these issues*). The results of our hypothesis testing were consistent with or without control variables.

TABLE 1 | Descriptive statistics and correlations (Study 1).

	Variables	Mean	SD	1	2	3	4	5	6	7	8
1	Industry profitability	−0.02	1.33								
2	Firm size (Sales) [a]	18.86	1.51	0.02							
3	Cost strategy	0.32	0.47	0.02	−0.01						
4	HR practices	3.17	1.33	−0.04	0.41	−0.14					
5	Union influence	0.95	1.08	0.03	0.37	0.09	0.11				
6	Employee gender diversity	0.29	0.12	−0.06	−0.04	−0.09	0.01	−0.11			
7	Proportion of women in TMTs	0.03	0.08	0.00	−0.02	−0.05	0.01	−0.02	0.20		
8	Relational coordination	3.44	0.35	0.00	0.26	−0.18	0.26	0.05	0.07	0.05	
9	Collective performance [b]	674.18	784.97	0.02	0.53	0.03	0.20	0.15	0.11	−0.03	0.22

Note: $N = 1017$ observations from 306 firms. All correlations above |0.06| are significant at $p < 0.05$.

[a]logarithm.

[b]Collective performance (labor productivity) was lagged 1 year (time $t + 1$) compared to all the predictors in our analyses.

4.3 | Study 1 Results

Table 1 presents descriptive statistics and correlations for the variables used in this study. We used the xtgee routine in Stata 13.0 (e.g., Chatterjee and Hambrick 2007; Quigley and Hambrick 2012). Researchers have used generalized estimating equations (GEEs) to analyze nested data. GEEs allow researchers to specify the correlation structure for the nested observations of the dependent variable in order to account for the dependence among nested observations. We specified a Gaussian distribution with an identity link function for all models and an independence correlation structure.[8] The predictor variables were grand-mean-centered to test interaction effects. Table 2 presents GEE results for our tests.

As shown in Table 2, our analysis revealed a positive moderating effect of the proportion of women in TMTs on the relationship between employee gender diversity and relational coordination ($b = 2.43$, SE = 1.23, $p = 0.048$; Model 2 in Table 2). To further probe this interaction (Figure 2), we plotted the interaction at higher (i.e., one standard deviation above the mean) and lower levels (i.e., one standard deviation below the mean) of the proportion of women in TMTs. Simple slopes analyses revealed that the relationship between employee gender diversity and relational coordination was positive and significant when the proportion of women in TMTs was higher (simple slope estimate = 0.37, SE = 0.13, $p = 0.006$) but it was non-significant when the proportion of women in TMTs was lower (simple slope estimate = −0.02, SE = 0.13, $p = 0.925$). The point estimates for the four conditions (high IV-high MOD, high IV-low MOD, low IV-high MOD, low IV-low MOD) are 2.47, 2.44, 2.40, and 2.45, respectively.[9] These results indicate that relational coordination is highest when both IV and MOD are high. Hypothesis 1 was supported.

In support of Hypothesis 2, the main effect of relational coordination on collective performance was significant and positive (Model 4 of Table 2; $b = 197.42$, SE = 62.72, $p = 0.002$). Finally, we ran a moderated mediation analysis to test Hypothesis 3. We used a Monte Carlo simulation procedure with 20,000 iterations to create 95% bias-corrected confidence intervals (CIs) around the conditional indirect effects at high and low levels (±1 SD) of our moderator (Preacher and Selig 2012). The conditional indirect effects of employee gender diversity on collective performance via relational coordination were significant and positive when the proportion of women in TMTs was higher (estimate = 72.53, 95% CI = 18.58, 167.7), but not when the proportion of women in TMTs was lower (estimate = −2.35, 95% CI = −57.47, 49.76). We further conducted the index of moderated mediation analysis to quantify the degree to which indirect relationships were moderated by our moderator (Hayes 2015). The index of moderated mediation was significant (estimate = 480.66, 95% CI = 48.37, 1260), supporting Hypothesis 3.

4.4 | Study 1 Discussion

Using panel data with multiple sources of data collected over 8 years, the results supported our hypotheses. Although this panel data sample is unique, and it is difficult to find such data, the data are also limited because interactions were captured at the firm level, which can be distal from employees' day-to-day experiences. Moreover, while our theory focuses on group-level processes and outcomes, Study 1 operationalizes our variables at the firm level as a preliminary test of our theoretical model. Also, the panel data used in Study 1 did not differentiate between CEOs and other top managers, thereby precluding the specific inclusion of CEO gender as a control variable. Thus, we conducted studies to investigate whether the proportion of women in TMTs at the group level can have effects on maximizing the benefits of group gender diversity and improving group performance while controlling for CEO gender.

5 | Study 2

To directly capture employee interaction patterns, we collected group-level data. We contacted managers participating in the executive training and EMBA program of a major Korean university. They worked full-time in different mid- and large-size firms in Korea. These managers recruited their group members to participate in our study. All participants received $8–$16 online gift cards. To be eligible for this study, group members

TABLE 2 | Results of GEE analysis predicting relational coordination and firm financial performance (Study 1).

	DV: Relational coordination						DV: Collective performance [b]					
	Model 1			Model 2			Model 3			Model 4		
Variables	***b***	**SE**	***p***	***B***	**SE**	***p***	***b***	**SE**	***p***	***b***	**SE**	***p***
Industry profitability	0.00	0.01	0.604	0.00	0.01	0.620	8.36	15.44	0.588	7.57	15.36	0.622
Firm size [a]	0.05**	0.01	0.000	0.05**	0.01	0.000	290.42**	15.94	0.000	280.90**	16.15	0.000
Cost strategy	−0.11**	0.02	0.000	−0.11**	0.02	0.000	84.27	44.88	0.060	105.44*	45.16	0.020
HR practices	0.04**	0.01	0.000	0.04**	0.01	0.000	−5.89	17.05	0.730	−14.20	17.17	0.408
Union influence	−0.01	0.01	0.447	−0.01	0.01	0.381	−36.46	20.73	0.079	−34.91	20.64	0.091
Employee gender diversity	0.17	0.09	0.059	0.18*	0.09	0.044	909.09**	177.71	0.000	876.08**	177.22	0.000
Proportion of women in TMTs	0.15	0.13	0.260	−0.02	0.16	0.905	−447.76	268.65	0.096	−477.51	267.52	0.074
Employee gender diversity × Proportion of women in TMTs				2.43*	1.23	0.048						
Relational coordination										197.42**	62.72	0.002
Wald χ^2	148.76* ($p < 0.001$)			153.23* ($p < 0.001$)			446.61* ($p < 0.001$)			460.86* ($p < 0.001$)		
R^2_{wald}				0.03						0.03		

Note: $N = 1017$ observations from 306 firms. Unstandardized coefficients (b) are reported.

*$p < 0.05$.

**$p < 0.01$.

[a]Logarithm.

[b]Collective performance (labor productivity) was lagged 1 year (time $t + 1$) compared to all the predictors in our analyses.

We reported the R^2_{wald} because standard R^2 metrics do not directly apply to GEEs. Our calculation of the R^2_{wald} as (1–($Wald\ statistic_{full}$)/$Wald\ statistic_{residual}$) is conceptually analogous to the standard R^2. $Wald\ statistic_{residual}$ refers to the variance when only the focal variable is missing in the model. $Wald\ statistic_{full}$ refers to the variance when the focal variable is included in the model.

had to interact with others on a regular basis and have more than 1 year of tenure on average, as suggested in prior works (Chang 2006; Seibert et al. 2004; van Dijke et al. 2012; Yun et al. 2005).

FIGURE 2 | The interaction of employee gender diversity and proportion of women in TMTs on relational coordination (Study 1).

Of the initially completed surveys from 128 eligible groups, we excluded groups that did not include at least two members (20 groups), did not have at least two top managers in their firms (6 groups), or could not provide an accurate number of top managers (10 groups). The final sample included data from 93 groups with 93 leaders and 341 members (on average, 3.67 employees per group, min = 2, max = 10).[10] The functional areas covered by the groups included business planning and administration (44.1%), sales and marketing (28.0%), R&D (10.8%), production and engineering (5.4%), service (2.2%), and others (9.7%). In the final sample, females represented 14.0% and 34.9% of the leaders and members, respectively. Of the leaders and members, 87.1% and 87.0% were between 21 and 50 years old, and 100% and 95.9% had completed a bachelor's degree or more, respectively. The average tenure was 9.7 years (SD = 6.7) and 5.5 years (SD = 5.7) for the leaders and members, respectively. Group leaders reported group gender composition, TMT gender composition, and CEO gender, while group members reported group relational coordination and collective performance.

5.1 | Measures

We adapted measures to be appropriate for our group context. Unless otherwise noted, responses were given on a 5-point

TABLE 3 | Descriptive statistics and correlations (Study 2).

	Variables	Mean	SD	1	2	3	4
1	CEO gender	0.09	0.28				
2	Group gender diversity	0.32	0.17	0.10			
3	Proportion of women in TMTs	0.13	0.14	0.33	0.17		
4	Group relational coordination	3.99	0.41	−0.11	0.04	0.03	
5	Collective performance	3.93	0.48	−0.21	0.05	0.01	0.67

Note: $N = 93$ (groups). We used a binary scale to capture CEO gender (1 = female, 0 = male). All correlations above |0.21| are significant at $p < 0.05$.

response scale, ranging from 1 = *not at all* to 5 = *a great deal*. Full scales are included in the Appendix.

5.1.1 | Employee Gender Diversity

Consistent with Study 1, we used Blau's diversity index. Group leaders reported the number of male and female members in their groups.

5.1.2 | Proportion of Women in TMTs

We operationalized the proportion of women in TMTs using the same process described in Study 1.

5.1.3 | Group Relational Coordination

We adapted the measure of relational coordination (5 items [$\alpha = 0.89$]) from Study 1 to be suitable for the group context ($r_{wg(j)\ median} = 0.95$, ICC(1) = 0.12, and ICC(2) = 0.33). Our supplemental analysis data from full-time employees ($N = 141$) showed that our measure of relational coordination converges with an existing measure drawn from the theory of relational coordination, the 10-item scale from Carmeli and Gittell (2009), while our measure further demonstrates discriminant and incremental validity. See Supporting Information: Section C for more details.

5.1.4 | Collective Performance

We utilized the three-item measure ($\alpha = 0.86$) adapted from De Hoogh et al. (2005).

5.1.5 | Control Variables

We controlled for CEO gender (1 = female, 0 = male) given its significant impact on employee perceptions and behaviors (Sergent and Stajkovic 2020). The results were consistent with or without this control variable.

5.2 | Study 2 Results

Table 3 contains descriptive statistics and correlations. CFA results revealed that the two-factor model at the group level (relational coordination and collective performance) had a satisfactory fit (χ^2 [19] = 40.78; CFI = 0.96; RMSEA = 0.11; SRMR = 0.04). This two-factor model fit better than the one-factor model in which the two factors were combined into one factor (χ^2 [20] = 93.57; CFI = 0.86; RMSEA = 0.20; and SRMR = 0.07; $\Delta\chi^2 = 52.79$, $\Delta df = 1$, $p < 0.001$).

We conducted a path analysis in Mplus 8.6 to test our hypotheses. As shown in Table 4, we found a significant interaction between group gender diversity and the proportion of women in TMTs ($b = 3.46$, SE = 1.43, $p = 0.015$) on relational coordination. To further probe this interaction (Figure 3), we plotted the interaction at the high level (mean + 1 SD) and the low level (mean − 1 SD) of the proportion of women in TMTs. Simple slope analyses showed that the relationship between group gender diversity and relational coordination was positive and significant when the proportion of women in the TMT is higher (simple slope estimate = 3.64, SE = 1.41, $p = 0.010$) but not significant when it is lower (simple slope estimate = 0.18, SE = 0.20, $p = 0.368$). The point estimates for the four conditions (high IV-high MOD, high IV-low MOD, low IV-high MOD, low IV-low MOD) are 2.53, 2.42, 2.35, and 2.47, respectively, showing that relational coordination is highest when both IV and MOD are high. Hypothesis 1 was supported.

As shown in Table 4, the main effect of group relational coordination on collective performance was significant and positive ($b = 0.72$, SE = 0.10, $p < 0.001$). Hypothesis 2 was supported. Finally, we used the same procedure as Study 1 to run a moderated mediation analysis. The conditional indirect effect of group gender diversity on collective performance via relational coordination was positive and significant when the proportion of women in TMTs is higher (estimate = 0.732, 95% CI = 0.179, 1.32), but not when it is lower (estimate = 0.109, 95% CI = −0.182, 0.389). The index of moderated mediation was also significant (estimate = 0.623, 95% CI = 0.076, 1.227). Hypothesis 3 was supported.

5.3 | Study 2 Discussion

Although these results are promising, our research has several limitations. First, neither Study 1 nor Study 2 delved into the underlying mechanisms, namely, the substantive and symbolic influences of the proportion of women in TMTs. Specifically, we theorized and made predictions about the roles of substantive influence (Hypothesis 1a) and symbolic influence (Hypothesis 1b) but these were not tested explicitly in Studies 1 and 2. Consequently, our understanding of the specific ways in which the proportion of women in TMTs shapes group dynamics

TABLE 4 | Results of path analysis predicting group relational coordination and group effectiveness (Study 2).

	DV: Group relational coordination			DV: Collective performance		
	Model 1			Model 2		
Variables	***b***	**SE**	***p***	***b***	**SE**	***P***
CEO gender	−0.18	0.18	0.323	−0.25	0.17	0.145
Group gender diversity	0.18	0.20	0.368	0.08	0.20	0.699
Proportion of women in TMTs	−0.04	0.30	0.903	0.10	0.21	0.620
Group gender diversity × Proportion of women in TMTs	3.46*	1.43	0.015			
Group relational coordination				0.70**	0.09	0.000
Total pseudo R^2		0.06			0.48	
Δ pseudo R^2		0.04			0.44	

Note: $N = 93$ (groups). Unstandardized coefficients (*b*) are reported. All significance tests based on two-tailed tests. Total pseudo *R*-squared indicates proportion of the variance in the outcome variable explained by the hypothesized model (compared to the baseline model). The change in pseudo *R*-squared (Δ pseudo R^2) reflects the increase in explained variance when only the focal variable (e.g., the interaction term or mediator) is added to the model (compared to the model only without the focal variable). We used the term "pseudo R^2" because a standard R^2 is a statistic derived from ordinary least squares regression. We reported the pseudo R^2 because our analysis employed maximum likelihood estimation (Cox and Snell 1989; Maddala 1983; Nagelkerke 1991). Our calculation of the pseudo R^2 as (residual variance–explained variance)/residual variance) is conceptually analogous to the standard R^2.

*$p < 0.05$.

**$p < 0.01$.

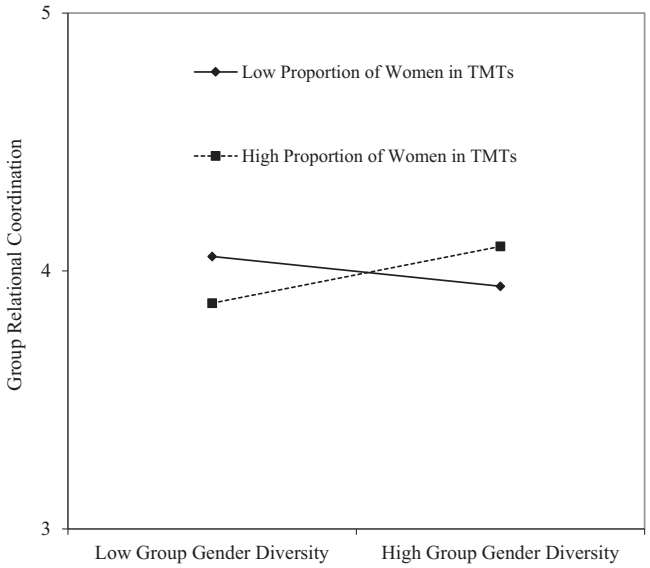

FIGURE 3 | The interaction of group gender diversity and proportion of women in TMTs on group relational coordination (Study 2).

remains incomplete. Second, the control variables in our dataset were not consistent across Study 1 and Study 2. In Study 2, given the limitation in our survey length, we omitted control variables used in Study 1 in our data collection. For empirical studies to be rigorous, it is critical to employ control variables that are consistent across studies to ensure the validity of the findings. Third, while we used a relational coordination measure consistent with Study 1, the measure is deficient in capturing a full spectrum of coordination patterns at work. Given the established, comprehensive measure of relational coordination available in the literature (Carmeli and Gittell 2009), it is important to replicate our findings with the use of this measure.

6 | Study 3

Study 3 was designed to address the aforementioned limitations and unravel how the proportion of women in TMTs strengthens the relationship between group gender diversity and relational coordination. Similar to Study 2, we collected group-level data from full-time managers and group members in Korea. Each manager and their group members received $8–$16 gift cards as rewards for their participation. We reached out to personal contacts to recruit individuals in managerial roles. Managers completed an initial survey and provided email addresses for their group members; then separate surveys were distributed to the designated group members. Consistent with Study 2, each group had to interact with others on a regular basis and have more than 1 year of tenure. All groups worked in different companies with at least two top managers, agreed to participate in our study, and confirmed confidentiality in their responses. Out of the initially completed surveys from 72 eligible groups, we excluded groups that did not have multiple group members who fully completed surveys (25 groups).

The final sample included data from 47 groups with 47 leaders and 149 members (on average, 3.13 employees per group, min = 3, max = 5). These groups were drawn from diverse organizations and industries, with the following distribution: manufacturing (29.8%), information technology (19.1%), service (19.1%), construction (4.3%), finance/insurance (2.1%), transportation/warehousing (2.1%), and other industries (23.4%). In the final sample, females represented 29.8% and 47.7% of the leaders and members, respectively. Of the final sample, 61.7% of leaders and 98.0% of members were between 21 and 50 years old, and 95.7% of leaders and 89.9% of members had completed a bachelor's degree or higher. The average organizational tenure was 13.1 years (SD = 9.8) for leaders and 5.4 years (SD = 5.0) for members. Leaders responded to questions on group gender composition, TMT gender composition, TMTs' substantive influence, collective

performance, and controls (CEO gender, industry profitability, cost-saving strategy, HR practices, union influence, and firm size), while members responded to questions on the TMTs' symbolic influence and relational coordination.

6.1 | Measures

Consistent with Study 2, we adapted measures to be appropriate for our group context. Unless otherwise noted, responses were given on a 5-point scale, ranging from 1 = *not at all* to 5 = *a great deal*. Full scales are included in the Appendix.

6.1.1 | Group Gender Diversity

Consistent with Study 2, we used Blau's diversity index. Group leaders reported the number of male and female members in their groups.

6.1.2 | Proportion of Women in TMTs

Consistent with Studies 1 and 2, we operationalized the proportion of women in TMTs.

6.1.3 | TMTs' Substantive Influence

We developed a new measure for substantive influence because no extant measure adequately captured the broad range of initiatives driven by TMT managers to support diversity and inclusion. To assess the substantive actions taken by TMTs to foster gender diversity and inclusion, we meticulously curated and adapted an eleven-item scale ($\alpha = 0.75$), integrating insights from a diverse range of scholarly works (Armstrong et al. 2010; Dwivedi et al. 2023; Konrad and Linnehan 1995; McKay et al. 2007, McKay et al. 2008; Nishii 2013). Our selection process was guided by a commitment to comprehensive coverage while remaining attuned to the constraints of survey length, the specific requirements of our research context, and the imperative to minimize overlap across different measurement scales. The items chosen collectively encompass a wide array of diversity-supportive practices, programs, policies, and initiatives. The measure includes ensuring equal access to training, conducting performance evaluations with impartiality, upholding an "equal pay for equal work" policy, actively engaging in public advocacy for gender diversity, implementing principles that support diversity, providing resources for resolving gender-related conflicts, developing effective diversity management strategies, and fostering a culture of collaboration and inclusivity. The strength of our measure lies in its comprehensive scope, capturing the multifaceted nature of TMT substantive actions aimed at promoting diversity and inclusion. It is important to highlight that we conducted a content validation study for our measures of substantive and symbolic influence, with results that support their validity (see Supporting Information: Section E).

6.1.4 | TMTs' Symbolic Influence

We adapted three items ($\alpha = 0.76$; $r_{wg(j)\ median} = 0.89$, ICC(1) = 0.53, and ICC(2) = 0.78) from prior works on anticipatory perceptions regarding equal opportunity for career advancement (Gutek et al. 1996; Olsen et al. 2016) to evaluate the symbolic impact conveyed by the gender composition of TMTs. Our measure is specifically designed to gauge perceptions surrounding the potential for equal career advancement opportunities, inferred from gender composition in the TMT. To isolate the symbolic influence of the TMT's gender composition from any actual, substantive influence, we instructed participants with specific guidance: "Please base your responses in 'your perception' of the TMT's gender composition, rather than on the TMT's actual actions or performance outcomes." This direction ensures a focused analysis on how the gender composition within TMTs symbolically influences employee perceptions. Our items address perceptions related to potential career advancement disparities between men and women in relation to the TMT's gender composition.

6.1.5 | Group Relational Coordination

We adapted the 10-item measure ($\alpha = 0.94$) from Carmeli and Gittell (2009) to be suitable for the group context ($r_{wg(j)\ median} = 0.98$, ICC(1) = 0.35, and ICC(2) = 0.63).

6.1.6 | Collective Performance

We utilized the three-item measure ($\alpha = 0.87$) of collective performance from Study 2.

6.1.7 | Control Variables

In addition to controlling for CEO gender, as done in Study 2, we accounted for other variables to mitigate potential alternative explanations, in alignment with Study 1. Specifically, we controlled for industry profitability using a single-item measure. Cost-saving strategy was also controlled using a single-item measure. Additionally, HR practices were assessed using the five items in Study 1, which were then summed across all five items. Union influence was controlled using a single-item measure rated on a 4-point scale. Lastly, we controlled for firm size, operationalized as the relative size within their industry based on their company's revenue using a 5-point scale.[11] The results were consistent with or without controls.

6.2 | Study 3 Results

Table 5 presents the means, standard deviations, and correlations among variables. We first conducted a series of CFAs to evaluate the fit of our measurement model (i.e., the four-factor model at the group level: TMTs' substantive influence, TMTs' symbolic influence, group relational coordination, and collective performance). The hypothesized four-factor model showed a satisfactory fit: χ^2 (48) = 63.43; CFI = 0.96; RMSEA = 0.08; and SRMR = 0.08.[12] This four-factor model fit better than alternative models where any of the two factors were combined ($33.76 \leq \Delta\chi^2$s $[\Delta df = 3] \leq 80.82$), where any of the three factors were combined ($94.83 \leq \Delta\ \chi^2$s $[\Delta df = 5] \leq 106.37$), and where all factors were

TABLE 5 | Descriptive statistics and correlations (Study 3).

	Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1	CEO gender	0.06	0.24	—										
2	Industry profitability	2.72	1.03	−0.10	—									
3	Firm size	3.53	1.01	−0.40	0.12	—								
4	Cost strategy	2.49	0.96	0.14	−0.13	0.10	—							
5	HR practices	3.23	1.56	0.13	0.19	0.21	−0.11	—						
6	Union influence	1.87	1.08	−0.13	0.12	0.32	−0.14	0.51	—					
7	Group gender diversity	0.35	0.16	0.20	−0.06	−0.23	0.14	0.00	−0.24	—				
8	Proportion of women in TMTs	0.18	0.19	0.39	0.03	−0.36	0.21	−0.10	−0.24	0.28	—			
9	TMTs' substantive influence	3.56	0.53	0.23	0.31	0.05	−0.09	0.42	0.28	−0.04	0.34	—		
10	TMTs' symbolic influence	3.17	0.74	−0.05	0.04	−0.18	−0.21	−0.25	−0.21	0.20	0.25	0.10	—	
11	Group relational coordination	3.82	0.50	0.13	0.26	−0.14	−0.35	0.14	0.09	0.14	0.01	0.20	0.39	—
12	Collective performance	3.87	0.64	0.42	−0.05	−0.04	−0.05	0.02	0.00	0.28	0.17	0.25	0.09	0.32

Note: $N = 47$ (groups). We used a binary scale to capture CEO gender (1 = female, 0 = male). All correlations above |0.32| are significant at $p < 0.05$.

combined into one factor (χ^2 [54] = 222.42; CFI = 0.55; RMSEA = 0.26; and SRMR = 0.19, $\Delta\chi^2 = 158.98$, $\Delta df = 6$, $p < 0.001$).

We conducted a path analysis in Mplus 8.6 to test our hypotheses (see Table 6). Initially, we examined whether the proportion of women within TMTs predicts TMTs' substantive influence and symbolic influence. The proportion of women in TMTs positively predicted TMTs' substantive influence ($b = 1.14$, SE = 0.34, $p = 0.001$) and symbolic influence ($b = 1.15$, SE = 0.55, $p = 0.036$). Thus, we conducted further analyses to test the moderating effects of TMTs' substantive influence and symbolic influence. We found a significant interaction between group gender diversity and TMTs' substantive influence ($b = 2.18$, SE = 0.84, $p = 0.009$) on group relational coordination. To further probe this interaction (Figure 4), we conducted simple slope analyses. The results showed that the relationship between group gender diversity and relational coordination was positive and significant when TMTs' substantive influence is higher (simple slope estimate = 1.52, SE = 0.53, $p = 0.004$), but it was not significant when it is lower (simple slope estimate = −0.22, SE = 0.56, $p = 0.69$). The point estimates for the four conditions (high IV-high MOD, high IV-low MOD, low IV-high MOD, low IV-low MOD) are 2.68, 2.27, 2.19, and 2.64, respectively, confirming that relational coordination is highest when both IV and MOD are high. Hypothesis 1a was supported. However, the interaction effect between group gender diversity and TMTs' symbolic influence on group relational coordination was not significant ($b = 0.50$, SE = 0.75, $p = 0.510$). Hypothesis 1b was not supported.

The direct effect of group relational coordination on collective performance was positive and significant ($b = 0.37$, SE = 0.18, $p = 0.033$), supporting Hypothesis 2. Given the significant moderating effect of TMTs' substantive influence, we conducted a moderated mediation analysis, using the same procedure as Studies 1 and 2. The conditional indirect effect of group gender diversity on collective performance was positive and significant when the level of TMTs' substantive influence is higher (estimate = 0.570, 95% CI = 0.0630, 1.518), but not when it is lower (estimate = −0.084, 95% CI = −0.603, 0.316). The index of moderated mediation was significant (estimate = 0.817, 95% CI = 0.122, 2.103). Finally, we tested the indirect moderating effect of the proportion of women in TMTs on the relationship between group gender diversity and relational coordination via the TMTs' substantive influence. The index of mediated moderation was positive and significant (estimate = 2.494, 95% CI = 0.659, 5.591). Hypothesis 3 was supported (via substantive influence).

7 | General Discussion

7.1 | Theoretical Implications

This study contributes to research on gender diversity in several ways. First, by studying an important moderator—the proportion of women in the TMT—we aim to help reconcile the inconsistent perspectives regarding the effect of workgroup gender diversity on collective performance. Prior examples of moderators (refer to the online supplemental materials, Section A, for an in-depth literature review) examined at the team/group level include gender diversity salience (Randel 2002), team orientation (Mohammed and Angell 2004), group size (Wegge et al. 2008), nationality (Zhang and Hou 2012), climate for inclusion (Nishii 2013), cooperative climate (Kukenberger and D'Innocenzo 2017), learning goal orientation (Li et al. 2022), and team withdrawal (Kearney et al. 2022). However, these studies primarily focus on group-level climate and member characteristics, overlooking how group-level gender diversity interacts with the gender composition of senior leadership to shape group outcomes. Our

TABLE 6 | Results of path analysis predicting the diversity-valuing behaviors and signal to gender equity of TMTs (Study 3).

	DV: TMTs' substantive influence			DV: TMTs' symbolic influence			DV: Group relational coordination			DV: Collective performance		
	Model 1			Model 2			Model 3			Model 4		
Variables	***b***	**SE**	***p***	***b***	**SE**	***p***	***b***	**SE**	***p***	***b***	**SE**	***p***
CEO gender	0.33	0.21	0.112	−0.37	0.33	0.262	0.35	0.23	0.124	1.09	0.31	0.000
Industry profitability	0.11*	0.05	0.030	0.03	0.09	0.791	0.08	0.06	0.162	−0.09	0.09	0.301
Firm size	0.07	0.06	0.196	−0.03	0.10	0.800	−0.06	0.07	0.361	0.16*	0.08	0.043
Cost strategy	−0.07	0.06	0.228	−0.21	0.11	0.061	−0.09	0.05	0.072	−0.07	0.07	0.330
HR practices	0.09	0.05	0.050	−0.09	0.08	0.231	0.00	0.04	0.983	−0.11	0.06	0.062
Union influence	0.09	0.07	0.209	−0.06	0.11	0.563	0.07	0.07	0.325	0.04	0.08	0.679
Group gender diversity							0.65	0.44	0.142	1.06*	0.42	0.012
Proportion of women in TMTs	1.14**	0.34	0.001	1.15*	0.55	0.036	−0.90**	0.35	0.009	−0.07	0.55	0.898
TMTs' substantive influence							0.05	0.16	0.765	0.29	0.18	0.111
TMTs' symbolic influence							0.28**	0.09	0.001	−0.09	0.13	0.452
Group gender diversity × TMTs' substantive influence							2.18**	0.84	0.009			
Group gender diversity × TMTs' symbolic influence							0.50	0.75	0.510			
Group relational coordination										0.37*	0.18	0.033
Total pseudo R^2	0.42			0.21			0.48			0.39		
Δ pseudo R^2	0.18			0.08			0.19			0.08		

Note: $N = 47$ (groups). Unstandardized coefficients (*b*) are reported. All significance tests based on two-tailed tests. Total pseudo *R*-squared indicates proportion of the variance in the outcome variable explained by the hypothesized model (compared to the baseline model). The change in pseudo *R*-squared (Δ pseudo R^2) reflects the increase in explained variance when only the focal variable (e.g., the interaction term or mediator) is added to the model (compared to the model only without the focal variable).

*$p < 0.05$.

**$p < 0.01$.

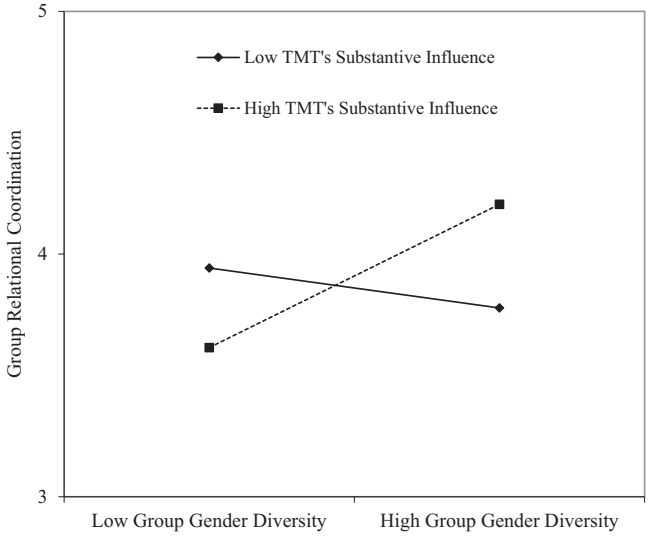

FIGURE 4 | The interaction of group gender diversity and the TMTs' substantive influence on group relational coordination (Study 3).

research adds to this body of work by demonstrating that the gender composition of TMTs can have a substantial impact on group-level management of gender diversity. Research shows that top managers significantly shape employees' values, motivation, and behaviors (Barrick et al. 2015; Ou et al. 2017) through their strategic decisions and symbolic cues (Recendes et al. 2024; Roberson et al. 2024). We suggest that TMT gender composition can serve as an important contextual factor that maximizes the productive potential of a gender-diverse workgroup.

Second, our research uniquely addresses both the substantive and symbolic influences of female representation in TMTs, distinguishing between mechanisms that previous studies often conflated. This approach responds to Dwertmann et al.'s (2016) observation that scholars have predominantly focused on firms' substantive actions to reduce social categorizations. They called for a differentiation between substantive and symbolic effects, examining these as independent dimensions. In Study 3, the proportion of women in TMTs contributes to both substantive and symbolic influences within organizations. However, it was the substantive influence—manifested through diversity-supportive practices, policies, programs, and initiatives—rather than the symbolic influence of signaling equal career advancement opportunities, that explained the benefits associated with the proportion of women in TMTs. Our findings underscore the significance of concrete actions and structural changes driven by TMTs. These tangible elements provide clear frameworks and resources that directly support diversity and inclusion, fostering an environment conducive to effective coordination among gender-diverse group members.

In contrast, the symbolic influence of the proportion of women in TMTs did not show significant effects. This lack of support for symbolic influence could be attributed to several factors. First, male members may harbor concerns about reverse discrimination, as they may not perceive enhanced career opportunities (Heilman et al. 1992). This perception could lead to resistance or skepticism towards symbolic gestures of gender equality in leadership. Second, and perhaps more intriguingly, female employees may have mixed interpretations of the presence of female top managers. While seeing women in leadership positions can inspire and motivate female employees, some might view these female leaders as exceptions rather than indicators of systemic change (Kanter 1977a). Additionally, female employees might scrutinize these leaders more critically, expecting them to actively advocate for gender equality issues (Mavin 2008). However, it is important to acknowledge that the insignificant moderating effects of symbolic influence could be attributed to empirical (rather than theoretical) issues such as the small sample size (i.e., low statistical power). Future research should explore the nuanced and often contradictory responses of employees to organizations' diversity-inclusive efforts, particularly focusing on the interplay between substantive and symbolic influences.

Finally, the present study, conducted in South Korea, contributes to diversity research by examining the impact of gender composition in a non-Western context. This is significant given the country's notably low proportion of women in top managerial positions and substantial gender gaps (Cho 2018; Kim and Cho 2018; Lee 2022; Park et al. 2022). South Korea's 31.12% median gender pay gap is the worst among the OECD (Organisation for Economic Co-operation and Development) group of developed countries for the 26th year in a row (Davies et al. 2023). Also, in South Korea's major corporations, women are significantly underrepresented in executive leadership, occupying merely 5%–6% of executive positions, which is far lower than the OECD average of 25.6% (Yonhap 2021, 2023). This situation points to a broader challenge of underutilized human capital within the Korean economy given systemic gender biases that limit the contributions of highly qualified women (Jeong 2019; Lahsen et al. 2020; Lee and Yeung 2021; The Economist 2020). Our findings suggest that even in such a socio-cultural environment, increased female presence in TMTs can promote gender equity. This research addresses the need for diversity studies beyond Western contexts, as highlighted by scholars like Klarsfeld et al. (2019) and Sparkman (2019). By demonstrating positive outcomes in a challenging setting for gender diversity, our study implies that similar benefits might be achievable in other countries facing comparable gender equity issues. However, our samples are limited in terms of generalizability. Further studies across various cultures and countries are necessary to fully understand the diverse impacts of the proportion of women in TMTs globally.

7.2 | Practical Implications

This research offers significant practical implications for managers and policymakers aiming to foster gender diversity and improve workplace collaboration. Over the past 50 years, the increased entry of women into the workforce has raised their representation in many teams, underscoring the importance of sustained efforts to support gender diversity. While many contemporary firms have introduced diversity and inclusion policies, concerns persist regarding their effectiveness, particularly as societal-level gender divides remain pronounced (Kim 2024; Potas 2025). Our findings provide actionable insights to navigate these challenges and promoting gender diversity across organizational levels.

The results indicate that a greater proportion of women in TMTs enhances the ability of gender-diverse workgroups to collaborate effectively and contribute to collective performance. This underscores the importance of addressing gender inequality in top leadership positions, where women remain underrepresented. A higher proportion of women in TMTs facilitates the implementation of gender-inclusive policies, which can dismantle entrenched gender divisions.

However, we recognize that many organizations may face constraints that prevent immediate changes to TMT or employee-level gender composition. For these firms, our findings suggest alternative strategies to enhance relational coordination and facilitate gender inclusivity. In firms with balanced gender composition at the employee level but limited female top managers in TMTs, relational coordination may suffer due to the absence of a strong top-down push for gender-inclusive policies. Such organizations could appoint a male top leader as a visible and credible advocate for diversity values, leveraging their positional authority to drive change. Male leaders who actively champion diversity values can play a critical role in creating buy-in across the organization and reinforcing the importance of inclusivity.

In firms where TMTs are gender-diverse but employee groups are male- or female-dominated, relational coordination may be hindered by employees' resistance to breaking established, gendered interaction patterns. To mitigate this resistance, top leaders should focus on initiatives that foster employees' general buy-in for embracing diverse perspectives. Programs encouraging cross-functional collaboration, joint problem-solving, and exposure to diverse viewpoints—beyond gender alone—can change norms and reduce resistance to inclusivity.

In summary, for firms unable to rapidly alter organizational demographics, prioritizing top-down diversity initiatives led by current leadership remains essential. These efforts should be paired with transparent communication to demonstrate organizational commitment to equity and inclusivity. Additionally, small-scale interventions, such as training programs to promote inclusive communication and collaboration, can yield incremental progress. By addressing key mechanisms that run through these scenarios of diverse gender makeup both at the top management and employee levels, our findings offer actionable insights for practitioners, even when the "optimal" configurations of TMT and group-level gender diversity are not immediately feasible. This broader approach ensures that organizations can meaningfully advance their diversity and inclusion goals, regardless of their starting point.

7.3 | Limitations and Future Research Directions

This study has several limitations that could lead to future research avenues. First, we acknowledge the possibility of undesirable effects of the proportion of women in the TMT. It is possible that the addition of female top managers can (unexpectedly) result in detrimental outcomes. For example, prior works on social identity theory, gender stereotypes, and tokenism suggest that female top managers may have a hard time being recognized by their male counterparts (Dwivedi et al. 2021; McDonald et al. 2018), stakeholders (Gupta et al. 2018), and organizational members (Brescoll 2016). Thus, female managers may struggle to be recognized by others and to realize their potential, which can have negative consequences for organizations.

Notably, as part of the supplemental analyses, we operationalized female representation in TMTs using three dummy variables: tokenism (only one female member; Kanter 1977b), twokenism (exactly two female members; Chang et al. 2019), and critical mass (at least three female members; Torchia et al. 2011). Our analyses consistently showed that the benefits of female representation in TMTs emerged when the number of female top managers reached or exceeded the critical mass of three (see online supplemental materials Section B). Furthermore, we conducted interviews with Korean executives, and we identified their negative and mixed reactions to the presence of female top managers (see Supporting Information: Section F). These results underscore the complexity of female presence in TMTs.

Furthermore, we conducted supplemental analyses to examine whether the use of Blau's index or proportion-based measures for TMT gender composition and employee gender diversity impacts our results. The findings are reported in the Supporting Information (see Tables B3–1 through B4–3). In summary, our results remained consistent when using Blau's index for TMT gender composition (see Tables B3–1 through B3–3). However, when we used a proportion-based measure for employee gender diversity, the results were no longer significant, except for Study 1 (see Tables B4–1 through B4–3). These findings align with prior research, which suggests that the indistinguishability of Blau's index and proportion-based measures depends on the proportion of females within the dataset. For example, Jeong and Harrison (2017, 1238) noted, "the fundamental reason for an ostensibly less precise conceptualization is that there simply is not enough variation in the distribution of women in upper echelons roles." They showed empirical evidence of "no difference in effect sizes" (Jeong and Harrison 2017, 1238) comparing the heterogeneity measure (i.e., Blau's index; TMT gender diversity) to the proportion measure in TMT samples. Specifically, when the proportion of females is very low (as is often the case with TMT gender composition), Blau's index and proportion measures are highly correlated and largely empirically indistinguishable. In contrast, when the proportion of females is relatively higher and sufficient (as is often the case with employee gender diversity), the two measures become more distinguishable. Thus, our study underscores the need to account for the context-specific implications of measurement choices.

Second, while our study leverages the comprehensive nature of relational coordination to cover high-quality interactions at work, a limitation arises from a lack of consideration for other alternative mechanisms. To fully grasp the spectrum of impacts linked to gender diversity, it is crucial to expand our focus to investigate other mediating factors, such as attracting highly skilled employees, boosting reputation, and improving communication channels between TMTs and staff. Our exclusive focus on relational coordination as an overarching construct to capture a wide range of high-quality workplace interactions, in line with Carmeli and Gittell (2009), has its advantages and disadvantages. This comprehensive framework enables the exploration of various interactional dynamics under the umbrella

of relational coordination. However, due to its comprehensive nature, it remains unclear which dimension of relational coordination is most crucial to capturing workplace interactions that stem from group diversity. Future researchers can build upon our work by investigating the distinct dimensions of high-quality interactions.

Third, we acknowledge various limitations of the samples. To begin, given the limited number of female members in TMTs, our data may not fully capture the effects of moderate to high levels of proportion of women in TMTs. Consequently, we are unable to empirically examine whether the effect of the proportion of women in TMTs is monotonic or curvilinear. Nonetheless, there is no reason to avoid studying gender composition at both top and lower levels, especially when the restricted range is representative of the population studied (Roberson et al. 2024; Van Knippenberg et al. 2011). Moreover, skewed distributions are relevant to our measure of firm performance in Study 1. While we assessed the robustness of our findings using alternative approaches to measuring firm performance (as detailed in Supporting Information: Section B), future research could use different measures, each with its own set of limitations.

Fourth, the cross-sectional design of Studies 2 and 3 presents limitations, particularly in establishing causality. While conducting research at the team level is often challenging due to the complexities of data collection and prior studies have employed cross-sectional designs to explore relationships between team-level constructs in organizational contexts (Chuang et al. 2016; Hill and Bartol 2016; Madrid et al. 2016; Sui et al. 2016; van de Brake and Berger 2023), it poses a challenge to internal validity due to the possible reverse causality. That is, teams with high collective performance may foster greater motivation among members to coordinate, thereby enhancing relational coordination within teams. Additionally, the chosen design may have inflated effect estimates. However, we took steps to mitigate this concern by implementing procedural precautions against common method bias (Podsakoff et al. 2012), such as utilizing different data sources (e.g., team leaders and members) and lagging the performance measure in Study 1. Future research can use longitudinal designs to provide more definitive evidence for the mediation processes. Incorporating external or objective measures of team performance could further strengthen future investigations.

Fifth, our incorporation of the substantive and symbolic framework provides a foundation for future diversity research, but there are several avenues for further exploration. While we focused on diversity-advocating practices and equal opportunity signaling as indicators of substantive and symbolic influences, respectively, other aspects may exist and warrant investigation. Additionally, the dominance of substantive or symbolic influences may vary depending on the type of diversity (e.g., ethnicity, age, gender), offering another rich area for study. Our work demonstrates how this framework can be applied to study diversity effects, develop theory, and create measures. We encourage researchers to build upon this foundation, refining and expanding the framework to deepen our understanding of diversity's impact in the workplace. Further validation and refinement of measures used to capture substantive and symbolic influences of different types of diversity are also essential. By pursuing these research directions, scholars can further uncover the complex ways in which diversity shapes organizational dynamics and outcomes.

Relatedly, we acknowledge potential limitations of measures used in Studies 2 and 3. First, while we validated a new measure for substantive influence to capture the diverse initiatives driven by TMT managers (see online supplemental materials Section E), this measure requires further validation across different organizational and cultural contexts to ensure its generalizability and robustness. Future studies could build on our initial work by refining the measure and testing its applicability in broader and more varied samples. Second, relying on managers' reports for TMT gender composition (Studies 2 and 3) bears the possibility of measurement error. We acknowledge the potential limitations of self-reported measures and the need for future research to use objective measures of gender composition.

8 | Conclusion

This research demonstrates that an increased proportion of women in TMTs facilitates effective coordination and performance of gender-diverse groups within organizations. The findings highlight the pivotal role of substantive influence over symbolic influence in realizing the benefits of the proportion of women in TMTs. The study underscores the necessity of enhancing the proportion of women in senior leadership roles to foster more inclusive and high-performing groups. Overall, our investigation calls for sustained efforts to elevate the proportion of women in TMTs, marking a critical step towards achieving gender diversity in leadership.

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Endnotes

[1] The primary reason for emphasizing the proportion of women, rather than gender diversity, at the TMT level is the very limited number of female executives. Consequently, upper echelon research frequently uses the proportion of women to indicate female membership in TMTs (e.g., Francoeur et al. 2008; Lyngsie and Foss 2017; Oh et al. 2018; Wu et al. 2022; Sieweke et al. 2023), whereas the Blau index is often used to capture gender composition at the group level (e.g., Joshi and Roh 2009; Kukenberger and D'Innocenzo 2020). Given the challenge in capturing true diversity at the top management level (i.e., essentially no true diversity), we have decided to focus on the proportion of female top managers. This approach more accurately reflects the current stage of progress in gender equity as it is and ensures better alignment between our theoretical framework and empirical analysis. In contrast, at the employee levels, there is significantly greater variance in gender distribution, allowing for a meaningful examination of gender diversity. For a similar approach, Joo et al. (2023) employed different metrics to capture gender diversity across organizational levels (for middle management, they calculated the proportion of female managers, while for subordinates, they used the Blau Index).

[2] The minority male members' resistance to the female-dominated teams is likely to have significant impact on the overall relational dynamics at the group level. This is because male members in female-dominated

work groups tend to take high-status positions, a phenomenon called the glass escalator (Williams 1992).

[3] This scenario is different from cases where either female or male members are dominant. We expect the homogeneity and aggression effects discussed above to be less likely given that no gender group is dominant.

[4] https://osf.io/5zq8k/?view_only=d0b190e7f7a94fb48f53528726c60d12. The structure is as follows: (a) An extensive literature review focusing on gender diversity is presented in Section A. (b) In Section B, we delve into supplemental analyses, employing alternative methods to operationalize female representation within TMTs (e.g., tokenism, twokenism, and critical mass) and collective performance, alongside results obtained in the absence of control variables. (c) The process of construct validation for our relational coordination measure is documented in Section C. (d) Section D describes the translation process for the measures employed in our study following the procedure guided by Klotz et al. (2023). (E) Section E outlines the content validation process for our measures of substantive and symbolic influence, following the guidelines established by Colquitt et al. (2019). (F) Section F offers quotes from our qualitative investigation involving Korean executives.

[5] Due to the data availability of our focal variables, we used the fourth through seventh rounds data (2010 through 2017). The HCCP data have been collected since 2005, and 2017 was the most updated year of the data collection at the time when this study was conducted. It is noteworthy that the HCCP has modified some of its survey content over time, thereby using slightly different measures and items at every time point. We chose to use the fourth through seventh rounds of data to have a complete dataset for the focal variables in our empirical model.

[6] We examined whether firms included in the final sample differed from those excluded from the final sample. We found no statistical difference between the two groups in our focal constructs, including employee gender composition [$F(1, 1567) = 1.56$, $p = 0.212$], TMT gender composition [$F(1, 1524) = 1.69$, $p = 0.194$], relational coordination [$F(1, 1728) = 1.03$, $p = 0.310$], and collective performance [$F(1, 1541) = 3.15$, $p = 0.076$].

[7] As a robustness check, we conducted supplemental analyses excluding organizations with minimal group representation (i.e., those with only one or two employee responses; 4 observations in total). The results remained consistent regardless of whether these observations were included or excluded from the analyses.

[8] We used quasi-likelihood under the independence model information criterion (QIC_u) to guide our model selection (e.g., an independence covariance structure had a smaller QIC_u than an exchangeable covariance structure; Pan 2001). The use of GEEs can improve statistical power by incorporating both between- and within-firm variance. GEE has been preferred over fixed effects models in examining firm-level implications of diversity because the level of diversity changes little within a firm and thus results in low within-firm variance (e.g., Hambrick et al. 2015; Hillman et al. 2007; Kolev and McNamara 2020; Knippen et al. 2019).

[9] To illustrate the practical significance of the change from 2.40 to 2.47, we estimated its economic impact. Given that the regression coefficient (b) is 197.42 (see Model 4 of Table 2) and the change in the predictor: 2.47–2.40 = 0.07, using the standard interpretation of a regression coefficient, we can multiply the coefficient by the change in the predictor: $197.42 \times 0.07 \approx 13.82$. Because our dependent variable (collective performance) is measured as labor productivity (operating revenue per full-time employee) in million won, an increase of 13.82 translates to an additional 13.82 million won per employee. Given that 1 million won ≈ U.S. $1000, this is about $13,820 per employee. To estimate the total increase for the entire organization, we would multiply $13,820 by the total number of employees. In other words, for a 0.07-point rise in relational coordination (from 2.40 to 2.47), the expected *total* increase in operating revenue (in US dollars) would be: ($13,820 per employee) × (number of employees).

[10] We conducted supplemental analyses to see whether the results hold when restricting the sample to groups with three or more employee responses. While it is a common practice in team research, it is also noteworthy that the literature on team-level studies does not have a strong consensus about the number of responses needed to be included (e.g., for 2 or more as criteria for inclusion, see Aubé and Rousseau 2011; Chen et al. 2007; Cole et al. 2008; Rubin et al. 2005). Study 2 included two-member teams ($N = 40$). After dropping these teams, the moderating effect of the proportion of women in the TMT was no longer statistically significant. We believe this attenuation is due to the substantial reduction in sample size, which likely suppressed statistical power. This discrepancy could also be attributed to lack of proximal mediating mechanisms in Study 2. For example, Study 3 included proximal mediating mechanisms, such as symbolic and substantive influence, which may have strengthened the observable effects of the moderator. Study 2, however, did not include these mediating mechanisms, potentially making the distal effects more susceptible to statistical power limitations. These findings underscore the importance of statistical power and theoretical proximity when examining nuanced group-level dynamics.

[11] This approach was chosen due to concerns about the accuracy of exact revenue numbers, as group leaders may not have precise knowledge of these figures, which could affect the reliability of their survey responses. Additionally, given our group-level focus, the perceived size of the firm by group leaders is more relevant than the actual revenue figure. Regarding the cost-saving strategy, although cost-saving and differentiation strategies can sometimes be seen as mutually compatible, Porter (1985, 17) asserts, "Usually, a firm must choose one strategy or risk becoming stuck in the middle." Porter emphasizes that pursuing both cost leadership and differentiation simultaneously is generally incompatible because differentiation usually entails significant costs.

[12] Considering the small sample size relative to the large number of measurement items (Landis et al. 2000), we used item parceling (Little et al. 2002) by randomly creating three item parcels each for TMTs' substantive influence and group relational coordination.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Appendix

Study Materials for Study 2

Responses were given on a 5-point scale, ranging from 1 = *not at all* to 5 = *a great deal*.

Group relational coordination

1. Our group members have positive communications when they interact with one another.
2. Our group members trust one another.
3. Our group members talk freely to one another about their opinions.
4. Harmony and collective identity among our group members are valued.
5. Our group members keep each other informed about the overall company issues.

Collective performance

1. The overall functioning of my group is excellent.
2. My group is capable.
3. My group is effective.

Study Materials For Study 3

Unless otherwise noted, responses were given on a 5-point scale, ranging from 1 = *not at all* to 5 = *a great deal*.

TMTs' substantive influence (diversity-supportive practices, programs, policies, and initiatives)

1. Our TMT strives to make sure that everyone has equal access to training regardless of their gender.
2. The performance review is fair in this firm regardless of employee gender.
3. Employees in this firm receive "equal pay for equal work" regardless of their gender.
4. Our TMT initiates open communication on gender diversity.
5. Our TMT publicizes diversity principles related to gender.
6. This firm commits resources to ensure that employees are able to resolve gender-related conflicts effectively.
7. Our TMT tries to improve ways to effectively manage gender-diverse members.
8. Our TMT does not hesitate to show others that they are committed to gender diversity.
9. In this firm, people often share and learn about one another as people rather than identifying themselves as belonging to specific gender groups.
10. This firm has a culture in which employees appreciate the differences in gender that people bring to the workplace.
11. Our TMT values working with diverse employees of different gender groups.

TMTs symbolic influence (signal for equal opportunity for career advancement)

Considering the gender composition of the TMT, how would you evaluate the following aspects? Please ground your responses in "your perception" of the TMT's gender composition, rather than on the TMT's actual actions or performance.

1. Men will be promoted faster than women in my company. (reverse-coded)
2. Men are more likely than women to receive tenure or its equivalent in my company. (reverse-coded)
3. Employees will not have difficulty advancing into a higher-level position at this company if they develop the right qualifications and experience regardless of their gender.

Group relational coordination

1. In this group, we share a common vision.
2. In this group, we act toward common goals.
3. Employees in this group know what tasks their co-workers deal with.
4. In this group, we share with one another the subjects we work on.
5. In this group, we share with one another in the context of work so that we can better understand the needs of each other.
6. In this group, we share with one another about our work issues so that we can better understand how our actions impact other co-workers.
7. In this group, there is a great deal of respect between one another at work.
8. In this group, when someone expresses her/his different opinion, we respect it.
9. Mutual respect is at the basis of our relationships in this group.
10. Members of this group operate with a clearly defined sense of direction.

Collective performance

1. The overall functioning of my group is excellent.
2. My group is capable.
3. My group is effective.

Industry levels of profitability

The industry our company belongs to is relatively profitable.

Firm size

Your company's revenue (1 = *significantly below industry average*; 2 = *slightly below industry average*; 3 = *about industry average*; 4 = *slightly above industry average*; 5 = *significantly above industry average*)

Cost-saving strategies

Our company emphasizes cost-saving rather than differentiation through new product development or quality improvement.

HR practices

Please indicate the presence or absence of the following systems or policies. (0 = *absence*, 1 = *presence*)

1. Does your company establish an annual human resource planning?
2. Does your company establish an annual human resource development (HRD) plan?

3. Does your company implement profit sharing?
4. Does your company conduct performance feedback?
5. Does your company operate an e-HR (electronic human resources) system?

Union influence

How much influence does your labor union have on organizational changes (such as departmental integration, closure, or restructuring) and employment adjustments? (1 = *no labor union exists;* 2 = *labor union exercises minimal influence;* 3 = *labor union is involved in consultation;* 4 = *agreement with the labor union is necessary*.)