

RESEARCH ARTICLE

The preventative benefit of group diversification on group performance decline: An investigation with latent growth models

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Summary

Integrating the open systems perspective of groups and the contingency approach to diversity, we study how group diversification (i.e., a process in which a group becomes more diverse over time as members join and/or leave the group) affects group performance change in an adverse task environment. We argue that diversification benefits performance by reducing group performance decline in times of adversity. Group size increase, however, attenuates this preventative benefit of group diversification. Focusing on organizational tenure and gender, we studied 279 sales groups (3277 individuals) in a large German financial consulting company from 2004 to 2008. In this period, a national legislative change prompted the company to withdraw its star product from the market and presented adversity to the sales groups. Results from latent growth models (LGMs) overall support our arguments. This research extends the (conditional) beneficial view of diversity from a static theoretical space about group *being* diverse to a dynamic one about group *becoming* diverse.

KEYWORDS

change, gender, group diversity, group performance, organizational tenure

1 | INTRODUCTION

In modern organizations, diversity is a conspicuous characteristic of many types of work groups. Generally, group diversity refers to member differences in demographic and psychological attributes (van Knippenberg, De Dreu, & Homan, 2004; Williams & O'Reilly, 1998). As a compositional input to group work, diversity is found to both positively and negatively affect group performance via distinct mechanisms. On the one hand, diversity is found to benefit group performance, because it introduces different ideas and perspectives, stimulates deep information processing, and leads to high decision quality, creativity, and performance (i.e., information processing perspective); on the other hand, diversity is found to harm group

performance, because it causes misunderstanding and dislike among dissimilar members, creates social divisiveness in the group, and lowers group identification, cohesion, and performance (i.e., social categorization perspective; Harrison & Klein, 2007; van Knippenberg & Schippers, 2007). The evidence from meta-analyses further shows that the effect of diversity on performance is contingent on contextual factors such as task complexity, performance measures, diversity types, and embedding industries (Guillaume, Brodbeck, & Riketta, 2012; Horwitz & Horwitz, 2007; Joshi & Roh, 2009; van Dijk, van Engen, & van Knippenberg, 2012; also see Shemla, Meyer, Greer, & Jehn, 2016; Wegge & Meyer, 2020). There is increasing consensus on a contingency approach to diversity. That is, when the team or task context accentuates the need for information processing

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(e.g., complex tasks) and/or mutes the salience of social identity, diversity is more likely to serve as a source of knowledge, stimulate information processing, and benefit group performance; vice versa for social categorization and detriment of diversity to performance (Harrison & Klein, 2007; van Knippenberg & Schippers, 2007).

Despite its unarguable value, this body of knowledge is limited in the sense that real-life work groups are malleable in composition as members join and/or leave the group (Mathieu, Tannenbaum, Donsbach, & Alliger, 2014; Wageman, Gardner, & Mortensen, 2012). As a compositional input to group work, diversity itself is dynamic as members join and/or leave the group. Yet, most diversity theory and research—including the contingency approach to diversity—have treated diversity as a static feature and operate within the boundary of unchanged group composition and diversity (Li, Meyer, Shemla, & Wegge, 2018; also see van Knippenberg & Mell, 2016). This is even the case in the most temporally concerned studies on diversity. As shown, the detriment of (demographic) diversity to group performance tends to diminish over time, because *the same* members in the group will learn more about each other, become better socially integrated, and thus improve in performance over time (e.g., Chatman & Flynn, 2001; Earley & Mosakowski, 2000; Harrison, Price, Gavin, & Florey, 2002; Harrison, Price, & Bell, 1998; Pelled, Eisenhardt, & Xin, 1999; Schippers, Den Hartog, Koopman, & Wienk, 2003). Under the condition of unchanged group composition and diversity, social categorization diminishes, but information processing emerges over time in diverse groups. At most, what is known in these studies is how the effect of unchanged diversity changes over time. What is not known is what if diversity itself changes over time, how diversity change affects the group (including group performance), and whether the two major theoretical mechanisms of diversity are still held in the novel boundary of dynamic group composition and diversity. As cautioned recently and strongly, researchers cannot simply assume that what holds for comparisons between more versus less diverse groups can be translated directly to understand change in group diversity over time, because theoretical mechanisms that account for the effects of the level of and change in a group construct are likely distinct from each other (Mathieu, Hollenbeck, van Knippenberg, & Ilgen, 2017, p. 463; also see Li et al., 2018; Mathieu et al., 2014).

Building upon the open systems perspective of groups and the contingency approach to diversity, we propose that group diversification (i.e., group becoming more diverse over time) can benefit group performance in an adverse task environment in the sense that it can reduce performance decline when the task environment presents uncertainty and risks for failure (Resick, Murase, Randall, & DeChurch, 2014; Waller, 1999). In line with the open systems perspective (Hackman, 2012; McGrath, Arrow, & Berdahl, 2000), we consider diversity as a dynamic input to group work and performance as a dynamic output of it. We study diversification in organizational tenure and in gender, because these diversity attributes affect group performance under adversity-related conditions even though they do not speak directly to the content of the group task (e.g., Chi, Huang, & Lin, 2009; Dezsö & Ross, 2012; Dwyer, Richard, & Chadwick, 2003; Ely, 2004). Our focus on the “peripheral” diversity attributes also relaxes the requirement for task interdependence and makes our findings relevant to a variety of group

tasks. In line with the contingency approach, we argue the following: An adverse task environment implies that the extant task approaches of the group are no longer effective and members in the group need to work together to come up with new task approaches for collective adaptation and survival. In this case, becoming more diverse over time (i.e., diversification) implies that member differences keep being expanded over time via membership change, and this keeps stimulating group information processing over time, which provides continuous benefits to group innovation, adaptation, and performance. Given that diversification can involve more than one member and that adaptation is harder for larger groups, we argue that the performance benefit of diversification is attenuated by group size increase. Our findings from a dataset of 279 sales groups (3277 individuals) in a large German financial consulting company over five (adverse) years generally support our arguments.

Our study makes three important contributions to diversity research. First, it provides novel insights into the performance implication of group becoming more diverse over time and extends the (conditional) beneficial view of diversity from the scope of stable group composition to that of dynamic group composition. Our study highlights a novel theoretical account for the benefit of group becoming more diverse over time, which is different from what accounts for the changing effect of unchanged diversity as in static diversity research. In static diversity research, what accounts for the diminishing detriment of unchanged diversity over time is the weakening of the social categorization mechanism and the strengthening of the information processing mechanism over time. The novel theoretical insight we seek to offer is: The key to the performance benefit of group becoming more diverse over time is that it keeps expanding member differences over time; when the task environment demands innovation, such diversification helps to *sustain* group information processing over time and thereby its benefits to group performance over time. Second, our study bridges the diversity and dynamic group composition literatures by suggesting that the value of group composition change depends on whether it renders the right changes in the right aspects of group composition (e.g., an increase in diversity; also see Mathieu et al., 2014). Third, on a broader note, our study points to a new line of dynamic diversity research that is more nuanced than static diversity research and is aligned with the organizational reality. Beyond the (a) preventive benefit we have found (i.e., reduction in performance decline), the benefit of diversification can also be manifested in (b) boosting performance growth and its detriment in (c) aggravating performance decline or (d) suppressing performance growth. A deeper understanding of why diversification benefits or harms group performance and under what conditions it does so will further advance diversity research along the temporal dynamic dimension.

2 | THEORETICAL BACKGROUND

2.1 | Group diversification and group performance change

To date, diversity research is almost exclusively about static diversity and embraces the assumption that once groups are formed, their

composition and diversity do not change over time. Even in the most notable studies on diversity over time, what is known is mostly about static diversity and its changing effect over time. As shown, diverse groups tend to underperform homogeneous groups initially but catch up with or surpass the latter in performance as time passes by (Chatman & Flynn, 2001; Earley & Mosakowski, 2000; Harrison et al., 1998, 2002; Pelled et al., 1999; Schippers et al., 2003). This is because dissimilar members in diverse groups initially interact with and categorize each other based on observable demographic attributes. But as they learn more about each other over time, the demographics-based social categorization diminishes, which alleviates the initial misunderstanding and tension, fosters information exchange and cooperation, and improves group performance over time. A key boundary of this knowledge is that the (diverse) group consists of the *same* members and membership stability allows these members to socially integrate over time. Both socio-emotional bonds (e.g., satisfaction with and commitment to the group) and group information processing (e.g., reflexivity) are able to develop within the *same* group of individual members as time passes by (Schippers et al., 2003). However, in the realm of membership instability with member joining and/or leaving the group over time (Mathieu et al., 2014; Wageman et al., 2012), the applicability of diminishing of social categorization and emerging of information processing is called in question. If knowledge about static diversity cannot be translated directly to understand diversity as a dynamic group feature (Mathieu et al., 2017) and if change in group composition and diversity is organizational reality (Li et al., 2018), it is important to theorize and study the performance implication of diversity change. This will advance diversity research into a new area beyond what is about the level of diversity.

We draw upon the open systems perspective and the contingency approach to diversity to conceptualize diversity change and theorize its implication to group performance. In line the open systems perspective (Hackman, 2012; McGrath et al., 2000), we define group diversification (homogenization) as a process in which a group becomes more (less) diverse over time as members join and/or leave the group. Generally, from this perspective, group inputs, throughputs, externalities, and outputs can vary from one (performance) episode to another (Kozlowski & Ilgen, 2006; Marks, Mathieu, & Zaccaro, 2001); the trajectory of a group output over time is a joint product of the trajectories of its inputs, throughputs, and externalities over time; between groups, groups differ from each other in their trajectories of inputs, throughputs, externalities, and outputs (equifinality; Hackman, 2012; McGrath et al., 2000). In consistency with this perspective, diversity is a dynamic compositional input to group work, performance is a dynamic output of group work, and diversity change is one possible determinant of performance change over time. This equifinality characteristic of open systems further implies that when the context pressures group development into one direction (i.e., strong situation), groups can still develop into the same direction but via distinct paths, because they can make idiosyncratic adjustments in group inputs and throughputs over time. Thus, to study the performance implication of diversity change is to understand how and why the degree of diversity change affects the degree of performance change over time. In the sections below, we focus on organizational tenure and gender and argue how and why group diversification

in these attributes benefits group performance change when the task environment presents uncertainty and risks for failure.

2.2 | An adverse task environment

Characterized with unexpected changes and high risks for failure, an adverse task environment represents a strong situation that connotes a *possibility* of group malfunctioning or performance deterioration but not a destiny of it. Groups that adapt well *can* perform well even when adversity strikes (Christian, Christian, Pearsall, & Long, 2017; Resick et al., 2014; Waller, 1999). Drawing up on the open systems perspective and the contingency approach, we argue that group diversification is likely an effective means to stimulate group adaptation in an adverse task environment. The adverse task environment implies that extant task approaches of the group are no longer be effective in addressing new task demands. In this case, group members need to (a) work together and (b) effectively process all task-relevant information to develop new task approaches and to adapt and perform well (Burke, Stagl, Salas, Pierce, & Kendall, 2006; Christian et al., 2017; Maynard, Kennedy, & Sommer, 2015). Such an adverse task environment may give rise to the performance advantage for groups with increased diversity. Specifically, when the context accentuates the need to process information and come up with new ideas (e.g., complex tasks, innovative tasks) and/or when it mutes the salience of social identity, a diversity attribute tends to act as a source of knowledge and diversity tends to trigger group information processing, which benefits group performance (vice versa for the detriment of diversity to performance; Harrison & Klein, 2007; van Dijk et al., 2012; van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007). The adverse task environment is such a context, given its demands for task approach innovation and member collaboration. Hence, in adversity, a diversity attribute tends to act as a source of knowledge; diversification in this attribute *expands* the knowledge differences among group members, makes them more alert to such differences (Choi & Levine, 2004; Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008; also see Phillips, Liljenquist, & Neale, 2009), and thereby stimulates members to share *previously* overlooked information and perspectives in the group work.

We focus on diversification in organizational tenure and in gender. As we will elaborate below, these diversity attributes do not speak directly to the content of the group task but affect group performance under conditions relevant to adversity (e.g., Chi et al., 2009; Dezsö & Ross, 2012; Dwyer et al., 2003; Ely, 2004). Although the empirical constraints do not allow us to test the proposed mediating mechanisms, we will argue in theoretical terms how these diversifications benefit group performance change in times of adversity.

2.3 | Group organizational tenure diversification and its impact

Organizational tenure refers to the temporal length of a person's employment in the organization. From the human capital perspective,

organizational tenure represents a type of tacit knowledge that is accumulated through employee organizational socialization and specifically about the organization (Ng & Feldman, 2010; Quiñones, Ford, & Teachout, 1995; Sturman, 2003). This knowledge includes declarative *what* knowledge about organizational goals, power structures, and interconnections of organizational practices (Gavin & Greenhaus, 1976). It also includes procedural *how* knowledge about how things are actually done in the organization, such as how organizational goals are carried out, how formal rules are applied (e.g., absolute no-goes versus potential leeway), and what resources and support to obtain from which key organizational players (Valle, Harris, & Andrews, 2004). Taking time to acquire and hinting at hidden task resources in the organization, this knowledge gives longer-tenured employees a unique cognitive advantage in performing core tasks of the job, especially complex and innovative tasks (Ng & Feldman, 2010; Quiñones et al., 1995). Because of this cognitive advantage—and because of stronger identification with and commitment to the organization—longer-tenured employees also exhibit more extra-role organizational citizenship behaviors such as helping colleagues in need and being willingness to work in less-than-ideal work circumstances (Ng & Feldman, 2010).

In the case of membership change, organizational tenure diversification results from the joining of longer- or shorter-than-averagely-tenured members and/or departure of averagely tenured members (vice versa for homogenization, Figure 1; also Li et al., 2018). Although organizational tenure diversification may not always expand the *range* of tenure-related knowledge in the group (e.g., in the case of departure of

averagely tenured members), it does change the *distribution* of such knowledge in the group and expands member differences in it.

In an adverse task environment, expansion in member differences in tenure-related knowledge—no matter through member addition, replacement, or departure—can make members more alert to their (expanded) knowledge gap. This can prompt longer-tenured members to more actively share their knowledge, advice, and help with shorter-tenured members and also encourage shorter-tenured members to more actively seek out information, advice, and knowledge from longer-tenured members (Ng & Feldman, 2010; also see Choi & Levine, 2004; Zellmer-Bruhn et al., 2008). When the context accentuates the need for information processing, the availability and *utilization* of different task-relevant information in the group is key to the performance benefit of diversity (Harrison & Klein, 2007; van Dijk et al., 2012; van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007). The adverse task environment is such a context, because how well group members collect, elaborate upon, and communicate task-relevant information is found to determine how well the group adapts and performs in such task environments as turbulent environments and non-routine tasks (Christian et al., 2017; Resick et al., 2014; Waller, 1999). Because knowledge represented in organizational tenure often hints at the hidden task resources in the organization (e.g., informal norms, permissible practices, and key organizational players to obtain support and resources from), when adversity strikes and presents a need for information processing, more active sharing and seeking of tenure-related knowledge in the group

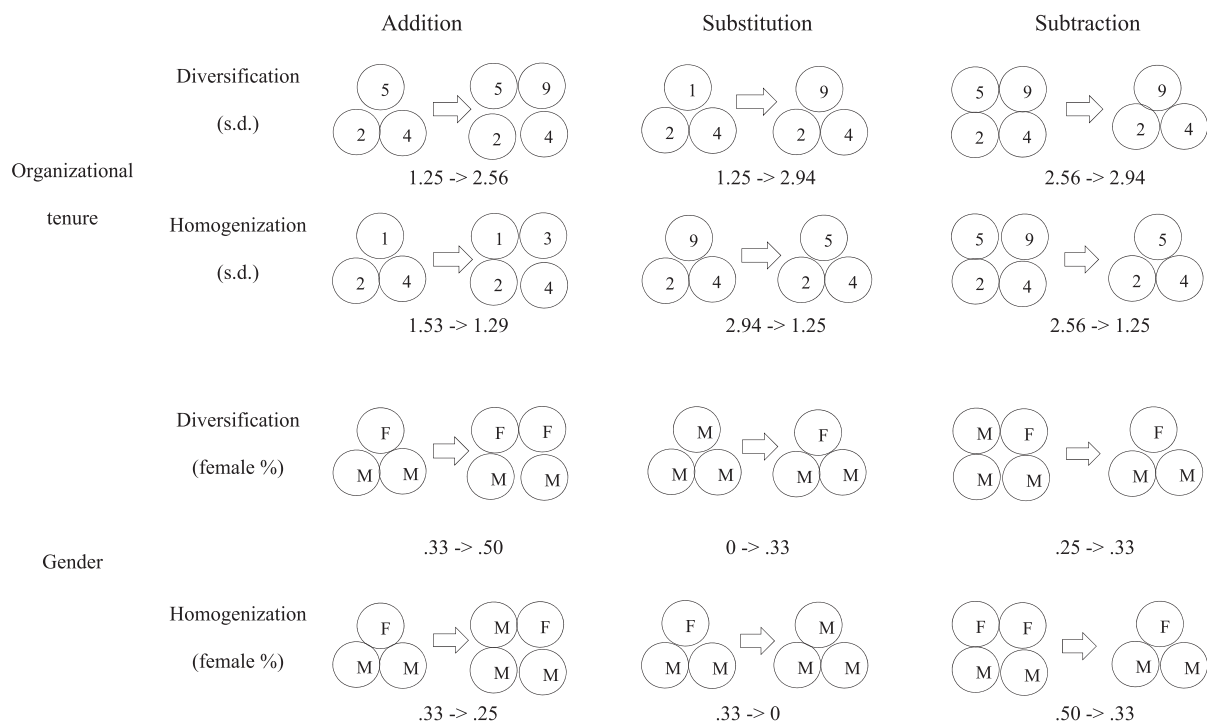


FIGURE 1 Examples of group diversification and homogenization in organizational tenure and gender via member addition, substitution, and subtraction. Adapted from Li et al. (2018). Each circle represents a member. The cluster to the left of an arrow represents a group before membership change, and that to the right represents the group after membership change. For organizational tenure diversity, the number inside a circle is a member's organizational tenure in years. Group organizational tenure diversity is measured by standard deviation. For gender diversity, F = female, M = male. Group gender diversity is measured by the percentage of female members in the group

can better inform *all* group members of what new ideas and changes are feasible within the organizational context, how change in one task practice affects another task practice, and from whom support and resources for new ideas and proposed changes can be obtained (also see Gavin & Greenhaus, 1976; Ng & Feldman, 2010; Steffens, Shemla, Wegge, & Diestel, 2014; Valle et al., 2004). This improved collective possession and processing of such knowledge in the group can increase the chance for the group to develop new and effective task approaches to deal with unexpected changes and thereby to adapt and perform well in adversity. Altogether, although the main effect of organizational tenure diversity on performance is *overall* negligible (Bell, Villado, Lukasik, Belau, & Briggs, 2011), we expect that in the adverse task environment

Hypothesis 1. Group organizational tenure diversification is positively related to group performance change such that groups with greater organizational tenure diversification over time will experience less decline in group performance in the same period.

2.4 | Group gender diversification and its impact

On average, women and men have demonstrated differences in some work-related preferences, behaviors, and styles. Specifically, women, on average, demonstrate greater preferences for participative decision-making, relationship-oriented behaviors, and attentiveness to environmental cues, details, and budget constraints than men (Bass & Avolio, 1994; Eagly, Johannesen-Schmidt, & van Engen, 2003; McGregor & Tweed, 2001). In male-predominant groups, female representation benefits group performance especially when the context accentuates a need for cooperation or an appreciation of (equal and) collective involvement. For example, a larger female representation in male-predominant top management teams (TMTs) deliver higher financial, innovative, and social performance for firms, especially when the national or organizational culture values gender parity or employee participation in decision-making (Dezsö & Ross, 2012; Dwyer et al., 2003; Marquis & Lee, 2013; Miller & del Carmen Triana, 2009; Post & Byron, 2015). Congruently, gender faultlines have no detriment to group creativity when not activated (Pearsall, Ellis, & Evans, 2008), and the social categorical detriment of gender diversity is smaller when group orientation, cooperation norm, and inclusion are greater (Mohammed & Angell, 2004; Nishii, 2013; Seong & Hong, 2013). Also, as proposed, in such male-predominate work groups as sales groups, gender diversity benefits group performance by enhancing relational skills, organizational citizenship behaviors, and shared leadership in the group, especially when the organizational culture emphasizes inclusion and collective involvement (Shoreibah, Marshall, & Gassenheimer, 2019; also see Fritzsche, Wegge, Schmauder, Kliegel, & Schmidt, 2014; also see Harrison & Klein, 2007; van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007).

When group membership changes, gender diversification in male-predominant groups indicates an increase in female representation in the group as a result of the joining of women and/or departure of men (vice versa for homogenization, Figure 1; also Li et al., 2018). We

focus on gender diversification in male-predominant groups, given that male is still the majority gender in the work force and in such work groups as TMTs and sales groups (International Labor Organization, 2015; Shoreibah et al., 2019). Whichever form of membership change it takes, gender diversification alters the distribution of men and women and expands their contrast in the group.

In an adverse task environment, the expanded gender contrast may make members more aware of the (increased) female representation in the male-predominant group. In the adverse task environment that accentuates the need for information processing and member collaboration, this enhanced awareness of the (increased) female representation may encourage women to more actively participate in the group work than before and also to exercise greater influence in the group work than before. Specifically, women, on average, score higher than men in competences pertaining to scanning the environment (e.g., recognizing opportunities and identifying customer needs), dealing with details, and managing budget constraints (McGregor & Tweed, 2001). Women, on average, also have greater preferences for participative decision-making and for positive interactions with colleagues than men (Bass & Avolio, 1994; Eagly et al., 2003). Thus, in adversity, an increased female representation in male-predominant groups and the increased involvement and influence of women in the collective group work may help the group to better integrate previously overlooked perspectives (e.g., the importance to scan the environment) and to better engage *all* members in the collective information exchange, discussion, and decision-making. This improved information processing in the group will likely conduce to successful group adaptation and performance in adversity (Christian et al., 2017; Resick et al., 2014; Waller, 1999). Altogether, we expect that in the adverse task environment

Hypothesis 2. Group gender diversification is positively related to group performance change such that groups with greater gender diversification over time will experience less decline in group performance in the same period.

2.5 | The attenuation of group size increase on the benefit of group diversification

Because groups can add, replace, or remove more than one member, diversification often comes with different degrees of group size change. As another pivotal compositional input to the group work, group size has been shown to exert mixed influences on group performance. On the one hand, a larger group size implies a bigger pool of human capital available in the group, and this availability of more task resources implies a higher chance for the group to manage different task challenges (Hülshager, Anderson, & Salgado, 2009; Stewart, 2006). On the other hand, larger groups are known to be subject to cognitive, coordinative, and socio-emotional liabilities that can hinder group performance (process loss; Steiner, 1972). Members in larger groups are less aware of the collective goals and other members' expertise, task roles, and preferences and thus have greater difficulty in forming consensus on task approaches (Bradner, Mark, &

Hertel, 2005; Rentsch & Klimoski, 2001; Sharma & Ghosh, 2007). Also, they participate less actively in the collective task and thus experience greater motivation loss and coordination difficulty (Bradner et al., 2005; Gersick & Hackman, 1990). Lastly, they perceive less support from each other and thus have lower satisfaction with and commitment to the group (Amason & Sapienza, 1997; Aubé, Rousseau, & Tremblay, 2011; Bradner et al., 2005). Altogether, although larger groups have a bigger pool of human capital, this does not necessarily mean that they can effectively utilize this human capital in the group task given the cognitive, coordinative, and socio-emotional liabilities associated with large group size.

As argued above, the key mechanism for group diversification to benefit group performance change in adversity is that the expanded knowledge differences of members make them more aware of such differences; when the task context requires information processing and member collaboration, members' enhanced awareness of their (expanded) knowledge differences will simulate information sharing, allow the group to incorporate the perspectives of previously under-represented members in the group work, and thus facilitate innovation-required adaptation and performance. Hence, given the greater difficulty in sharing information, motivating members, and forming rapport in larger groups, we expect that in the adverse task environment

Hypotheses 3 and 4. Group size increase will attenuate the positive effects of group organizational tenure diversification (H3) and group gender diversification (H4) on group performance decline such that the positive effects will be weaker when group size increases more.

3 | METHOD

3.1 | Sample

To test the hypotheses, we collected the complete data from the personnel records of 279 sales groups (3277 individuals) in a large financial consulting company in Germany from 2004 to 2008. The groups and individuals were the ones that existed in the records in any of the five years. Each consultant was a member of one group in a year and did not have multiple group memberships. The information includes consultants' group membership, demographic features (e.g., gender, age, and organizational tenure), and objective performance measures every year.

The primary task of a sales group (or branch) was to sell insurance and other financial products to private customers and small enterprises within an assigned region. Members of a group were all situated in one office, sharing the same facilities, assisted by the same secretary, and under the daily supervision of a group leader whose responsibilities included the professional training and career development of the group members as well as communication with the higher management.

Although the primary task of the group—selling—was an additive task in which individual contributions to the group were proportionate to their abilities (Steiner, 1972), this did not imply a complete void of

task interdependence in the group for the following reasons. First, consultants in a group had differential knowledge about the products, customers, market, and regulations. In some scenarios, they needed to combine this knowledge and work together on a sales deal. One of such scenarios was when the deal was large scale or involved complex financial products (e.g., insurance schemes for new enterprises with more than 200 employees or for clinics with 20 different medical doctors). Another scenario was when the deal was handled by a new or inexperienced consultant. In this case, the group leader or an experienced consultant worked together with the novice. Second, except for the aforementioned scenarios, a sales deal was assigned to only one consultant, and this exclusive assignment would be double-checked in case of doubt. Because of little within-group competition, consultants often sought advice and help from colleagues before meeting clients. Apart from this informal communication, the group held weekly meetings (2 to 3 hours on Monday mornings) to discuss group-level issues and exchange individual members' questions, ideas, and wishes. Third, given the collective work, within-group coordination was facilitated in multiple ways. Consultants synchronized their activities with electronic calendars, activity management systems, and the like. The group leader and secretary also kept track of individual planning and helped to coordinate consultants' activities. Such interdependent arrangements within these sales groups resonate with the informational demand in the sales work especially in knowledge-intensive industries (e.g., financial consultancy; also see Müller, Pommeranz, Weisser, & Voigt, 2018). Furthermore, sharing and combining members' differential knowledge about the customers and products within the group can help the group to leverage such knowledge, to use such knowledge to guide all members' practices, and thus to reach high individual and group performance (Menguc, Auh, & Uslu, 2013; also see Lai & Yang, 2017). Thus, taken together, although individual consultants' performance (i.e., commission) was added to the group level, these features in consultants' work suggested a certain level of task interdependence and sharedness that were aligned with core features of group work (e.g., Chan, 1998a; Larson, 2009). We deemed these groups suitable for testing our hypotheses.

In 2005, a structural reform in Germany's pension system caused a significant change in the country's tax laws and financial legislations and thus forced the company to withdraw one of their most successful products from the market. As a result, consultants could no longer rely on the star product in generating sales and revenues. This higher-level change presented great uncertainty to the consultant groups and urged them to adapt and develop new approaches to achieve performance goals (e.g., learning about other products, re-combining products creatively, developing new ways to address existing clients' needs, searching out new clients, etc.). This situation represented an organizational-level crisis in which a low-probability, high-impact event threatened the viability of the organization and was characterized by the ambiguity of its causes, effects, and/or means to solve (Pearson & Clair, 1998). Because the impact of an organizational crisis typically lasted a few years (Williams, Gruber, Sutcliffe, Shepherd, & Zhao, 2017), we deemed this setting an adverse task environment for the sales groups and suitable for our study.

Among the total 279 groups that existed from 2004 to 2008, 228 groups (81.7%) existed in all the five years, 11 (3.9%) in four consecutive years, five (1.8%) in three consecutive years, 25 (9%) in two consecutive years, nine (3.2%) in only one year, and one existed in two discrete years (0.4%). The average group size was 8.86 in 2004 ($SD = 3.16$, $n_1 = 265$), 9.02 in 2005 ($SD = 3.24$, $n_2 = 259$), 10.00 in 2006 ($SD = 3.56$, $n_3 = 247$), 10.04 in 2007 ($SD = 3.76$, $n_4 = 251$), and 8.86 in 2008 ($SD = 3.34$, $n_5 = 238$).

3.2 | Measures

For each group in each year, we calculated organizational tenure diversity, gender diversity, and performance based on the group size in that year. *Organizational tenure diversity* was measured by the standard deviation of group members' organizational tenure. In latent growth models (LGMs), organizational tenure diversification was captured by the specification of a linear slope in organizational tenure diversity across the five years (explained below). We measured group organizational tenure mean and controlled for the effect of its change to identify the unique effect of organizational tenure diversity change.

Gender diversity was measured by the percentage of female members in the group. This measure was theoretically consistent with our interest in gender diversification in male-predominant work groups. It also empirically fit with the 279 groups in the sample that were all over-represented by men. Not a single group had more than 50% women in any year, and the average female representation in the group was 12%, 12%, 11%, 12%, and 13% from 2004 to 2008, respectively. We also calculated Blau's (1977) index, which had high positive correlations with the percentage measure of gender diversity, that is, .97, .98, .97, .96, and .84 from 2004 to 2008, respectively. In LGMs, group gender diversification was captured by the specification of a linear slope in group gender diversity across the five years.

Group size was measured by the number of members in the group. Group size increase was captured by the specification of a linear slope in group size across the five years.

Group performance was measured by group members' mean performance. We used the same objective performance measure that the company used for individual consultants and their groups. For individual consultants, this measure was a contrast of his or her commission level to the average commission level of all consultants in the company in the previous year. According to the company, this measure was designated to set challenging goals for consultants and also to make their performance comparable across the company. We averaged individual performance to group performance. As suggested, for additive group tasks, it is appropriate to sum or average the performance of lower-level units for the performance of the higher-level unit (Chan, 1998a). Moreover, we calculated *rwg*, intraclass correlation coefficient ($ICC[1]$), and *F*-statistics (for the random effects of group membership) to see whether this performance aggregation was justifiable. We used LeBreton and Senter's (2008) guidance to judge; that is, *rwg* from 0.51 to 1.00 indicates moderate to very strong within-group agreement, and $ICC(1)$ at 0.01 indicates a small effect size of group membership, 0.10 a

medium one, and 0.25 a large one. In 2004, 87.1% of the groups had $rwg \geq 0.51$, and among all the groups, $ICC(1) = 0.13$, $F(12, 182) = 3.31$, $p < .01$. In 2005, 96.1% of the groups had $rwg \geq 0.51$, and among all the groups, $ICC(1) = 0.12$, $F(17, 252) = 3.01$, $p < .01$. In 2006, 92.7% of the groups had $rwg \geq 0.51$, and among all the groups, $ICC(1) = 0.07$, $F(22, 322) = 2.04$, $p < .01$. In 2007, 92.4% of the groups had $rwg \geq 0.51$, and among all the groups, $ICC(1) = 0.01$, $F(24, 350) = 1.15$, $p = .29$. In 2008, 99.2% of the groups had $rwg \geq 0.51$, and among all the groups, $ICC(1) = 0.003$, $F(14, 210) = 1.05$, $p = .41$. Altogether, although group membership had a small to median influence on individual performance ($ICC[1]$ s), most groups in the sample (87.1% to 99.2% in the five years) had moderate-to-very-strong within-group agreement (*rwgs*) and in most years, between-group differences (*F*-statistics) were significant. Overall, these numbers justified the aggregation of individual performance to group performance. In LGMs, group performance decline was captured by the specification of a linear slope in group performance across the five years.

3.3 | Analyses

3.3.1 | Preliminary analyses

In our sample, the percentage of the missing data was very small, namely, 9.7% of the total 1395 data points ($1395 = 279 \text{ groups} \times 5 \text{ years}$). As suggested, when missing data are below 10% of the total data, estimation bias is inconsequential, and this is particularly the case when the sample size is large ($n \geq 1000$; Cheema, 2014; Dong & Peng, 2013). Nonetheless, given that patterns of data missing were crucial for longitudinal research, we followed Ployhart and Vandenberg's (2010) suggestions and examined the randomness of data missing with *Little's Missing Completely at Random (MCAR) Test*. Non-significant results of this test would suggest complete randomness of data missing, and significant results would call for remedies. The MCAR results showed that data missing were complete at random for gender diversity ($\chi^2(28) = 37.90$, $p = .10$) and group performance ($\chi^2(26) = 33.41$, $p = .15$) but not for organizational tenure diversity ($\chi^2(26) = 87.34$, $p < .01$), organizational tenure mean ($\chi^2(28) = 84.23$, $p < .01$), or group size ($\chi^2(26) = 114.53$, $p < .01$). Thus, we followed Ployhart and Vandenberg's (2010) suggestions and use expectation-maximization (EM) estimates to impute the missing values for all the variables. The EM method is recommended as a missing data treatment that is superior to other methods (e.g., listwise or pairwise deletion; Cheema, 2014; Newman, 2003), as it generates estimates as if the missing data would have been completely at random. With this remedy, we minimized the potential bias of data missing in testing our hypotheses.

3.3.2 | Main analyses

We tested the hypotheses with LGMs and LISREL 8.80 (Bollen & Curran, 2006; Chan, 1998b; Sacco & Schmitt, 2005; Vandenberg &

Lance, 2000). For the main effects model (H1, H2), we assumed that group size, organizational tenure diversity, organizational tenure mean, gender diversity, and group performance *each* followed a linear development pattern from 2004 to 2008. For each construct over the five years, we specified two latent factors, namely, an intercept for the construct's level and a slope for its change. Take organizational tenure diversity for example. We fixed factor loadings $\lambda_1, \lambda_2, \lambda_3, \lambda_4$, and λ_5 of organizational tenure diversity from 2004 to 2008 on the intercept of organizational tenure diversity all to 1 and factor loadings $\lambda_6, \lambda_7, \lambda_8$, and λ_9 of organizational tenure diversity from 2005 and 2008 on the slope of organizational tenure diversity to 1, 2, 3, and 4 respectively. We also regressed in the same model (a) the intercept of group performance on the intercepts of group size, tenure diversity, tenure mean, and gender diversity and (b) the slope of group performance on the slopes of these predicting constructs.

For the model of a dynamic moderation effect (H3, H4), we adapted Cortina, Chen, and Dunlap's (2001) method of testing latent moderation effects to the longitudinal setting. In addition to assuming linear development patterns for *all* constructs as above, we calculated the product term between the focal independent construct (e.g., organizational tenure diversity) and the moderator (group size) in *each* year and assumed a quadratic development pattern of this product term over the five years. Specifically, we fixed factor loadings $\lambda_1, \lambda_2, \lambda_3, \lambda_4$, and λ_5 of the product term from 2004 to 2008 on the intercept all to 1 and factor loadings $\lambda_6, \lambda_7, \lambda_8$, and λ_9 of the product term from 2005 and 2008 on the slope to 1, 4, 9, and 16 respectively. We then regressed in the same model (a) the intercept of group performance on the intercept of the product term and the intercepts of all the predicting constructs and (b) the slope of group performance on the slope of the product term and the slopes of all the predicting constructs. In this way, we tested a full dynamic moderation effect in which the predictor(s), moderator, and outcome were all dynamic constructs and measured repeatedly over time.

Additionally, we allowed the errors of the same construct to correlate over the five years. Error correlations are permissible for the same item over time, although they are questionable for items of the same or different constructs at one time moment (Landis, Edwards, & Cortina, 2009; Little, 2013). Moreover, we allowed errors of the product term and its corresponding variables in the same year to correlate. For example, we allowed the errors between the product term of group size and organizational tenure diversity in 2004 and organizational tenure diversity in 2004 to correlate. It is reasonable to think that extraneous factors that affect group size and/or organizational tenure diversity in a year are likely to affect the multiplication term of the two in the same year.

4 | RESULTS

In Table 1, we present the descriptive statistics and correlations of the 25 observed variables. In Table 2, we present the distribution of the 279 groups across the three change categories—that is, increasing, decreasing, and unchanged—for each construct. We used the data in

2005 and 2007, as the trending between these two years could be seen as a proxy of the trending across the five years. For organizational tenure diversity, 235 groups (84.2%) had an increasing trend and 40 groups (14.3%) a decreasing one. For gender diversity, an equal number of groups, 107 groups (38.4%), had an increasing or decreasing trend. For group size, 171 groups (61.3%) had an increasing trend and 65 groups (23.3%) a decreasing one. For group performance, 184 groups (65.9%) had a decreasing trend and 93 groups (33.3%) an increasing one.

In M1, we tested the main effects of organizational tenure diversification and gender diversification on group performance change. The LGM results (Table 3) showed a good model fit ($\chi^2(254) = 718.76$, CFI = .96, RMSEA = .08, 90% CI [.07, .09]). We took .92 as the CFI cut-off value and .10 as the RMSEA cut-off value, because structural equation models—the general modeling framework LGMs belong to—are highly sensitive to sample size and model complexity. More lenient model fit criteria are recommended for larger samples (data points > 250) and more complex models (Hair, Black, Babin, & Anderson, 2014). In our study, the sample size was large (data points = 1395) and the LGMs were complex in the sense that predicting, moderating, and outcome constructs were all repeatedly measured 5 times and their changes were modeled. Hence, we deemed these reported model fit indexes to be sufficient. The slope of organizational tenure diversity ($b = 0.03$, $t = 1.82$, $p = .07$) and the slope of gender diversity ($b = 0.18$, $t = 2.03$, $p = .04$) were positively related to the slope of group performance respectively. Hypothesis 1 was marginally supported, and Hypothesis 2 was supported. Between groups, 1% more increase in organizational tenure diversity (gender diversity) lessened 0.03% (0.18%) more decline in group performance over the five years. In the practical terms, change in organizational tenure diversity and change in gender diversity were often greater than 1%. In our setting, the sample mean increase in organizational tenure diversity across the five years was 27.54%, and this translated into preventing 8.26% performance decline (i.e., $27.54\% \times 0.03$); the sample mean change in gender diversity was 1.19%, and this translated into preventing 0.21% performance decline across the five years (i.e., $1.19\% \times 0.18$). Moreover, the benefit of organizational tenure diversity increase was independent of that of organizational tenure mean increase ($b = 0.02$, $t = 2.31$, $p < .01$).

In M2, we tested the attenuating effect of group size increase on the benefit of organizational tenure diversification on group performance change. The LGM results showed a good model fit ($\chi^2(354) = 1165.20$, CFI = .96, RMSEA = .09, 90% CI [.09, .10]). The slope of the product term between group size and organizational tenure diversity was negatively related to the slope of group performance ($b = -0.01$, $t = -2.05$, $p = .04$). Hypothesis 3 was supported. The interaction effect was graphed in Figure 2. The slope of organizational tenure diversity was still positively related to the slope of group performance ($b = 0.06$, $t = 3.20$, $p < .01$).

In M3, we tested the attenuating effect of group size increase on the benefit of gender diversification on group performance change. The LGM results showed a good model fit ($\chi^2(358) = 1044.63$, CFI = .96, RMSEA = .08, 90% CI [.08, .09]). But the slope of the

TABLE 1 Descriptive statistics and correlations of the included variables (N = 279)

| Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|--|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. Group size 2004 | 8.88 | 3.04 | - | | | | | | | | | | | | | | |
| 2. Group size 2005 | 9.00 | 3.12 | .81** | - | | | | | | | | | | | | | |
| 3. Group size 2006 | 9.98 | 3.31 | .65** | .80** | - | | | | | | | | | | | | |
| 4. Group size 2007 | 10.04 | 3.53 | .55** | .71** | .84** | - | | | | | | | | | | | |
| 5. Group size 2008 | 8.82 | 3.06 | .49** | .60** | .71** | .82** | - | | | | | | | | | | |
| 6. Organizational tenure diversity 2004 | 2.92 | 1.41 | .17** | .21** | .15* | .12* | .14* | - | | | | | | | | | |
| 7. Organizational tenure diversity 2005 | 3.20 | 1.43 | .14* | .23** | .17** | .13* | .14* | .92** | - | | | | | | | | |
| 8. Organizational tenure diversity 2006 | 3.63 | 1.36 | .13* | .17** | .17** | .14* | .13* | .83** | .88** | - | | | | | | | |
| 9. Organizational tenure diversity 2007 | 3.87 | 1.30 | .13* | .17** | .16** | .16** | .14* | .80** | .83** | .90** | - | | | | | | |
| 10. Organizational tenure diversity 2008 | 3.84 | 1.30 | .11 | .13** | .10 | .13* | .18** | .69** | .71** | .78** | .83** | - | | | | | |
| 11. Organizational tenure mean 2004 | 4.37 | 2.01 | .19** | .30** | .28** | .23** | .24** | .73** | .73** | .71** | .68** | .57** | - | | | | |
| 12. Organizational tenure mean 2005 | 4.95 | 2.00 | .25** | .29** | .27** | .22** | .22** | .71** | .75** | .77** | .73** | .60** | .89** | - | | | |
| 13. Organizational tenure mean 2006 | 5.30 | 2.01 | .27** | .33** | .28** | .25** | .24** | .66** | .69** | .73** | .73** | .60** | .83** | .89** | - | | |
| 14. Organizational tenure mean 2007 | 5.83 | 2.18 | .26** | .32** | .31** | .25** | .22** | .63** | .65** | .68** | .66** | .52** | .78** | .85** | .92** | - | |
| 15. Organizational tenure mean 2008 | 7.24 | 2.20 | .24** | .25** | .23** | .17** | .16** | .59** | .61** | .65** | .61** | .54** | .76** | .80** | .84** | .89** | - |
| 16. Gender diversity 2004 | 0.13 | 0.12 | .08 | .00 | -.01 | -.04 | -.00 | -.05 | -.06 | -.02 | -.02 | .02 | -.09 | -.08 | -.07 | -.08 | -.04 |
| 17. Gender diversity 2005 | 0.14 | 0.12 | .08 | .04 | .04 | .01 | .01 | -.07 | -.04 | -.00 | -.04 | .02 | -.09 | -.06 | -.06 | -.06 | -.06 |
| 18. Gender diversity 2006 | 0.14 | 0.11 | .08 | .05 | .05 | .01 | -.01 | -.05 | -.03 | -.01 | -.06 | -.00 | -.04 | -.05 | -.06 | -.07 | -.02 |
| 19. Gender diversity 2007 | 0.14 | 0.12 | .05 | .02 | .05 | .04 | .03 | -.02 | .01 | .02 | -.02 | .03 | -.03 | -.02 | -.05 | -.06 | -.02 |
| 20. Gender diversity 2008 | 0.13 | 0.13 | .10 | .09 | .11 | .07 | .06 | .01 | .01 | -.02 | -.02 | -.01 | -.01 | -.03 | -.05 | -.05 | -.09 |
| 21. Group performance 2004 | 1.15 | 0.39 | .09 | .15* | .13* | .10 | .08 | .32** | .28** | .19** | .21** | .11 | .22** | .22** | .18** | .23** | .18** |
| 22. Group performance 2005 | 0.80 | 0.34 | .13* | .18** | .20** | .18** | .21** | .35** | .41** | .36** | .38** | .34** | .42** | .43** | .37** | .38** | .36** |
| 23. Group performance 2006 | 0.87 | 0.41 | .05 | .03 | .10 | .07 | .06 | .18** | .19** | .27** | .25** | .20** | .23** | .28** | .21** | .24** | .21** |
| 24. Group performance 2007 | 0.72 | 0.38 | .09 | .12* | .11 | .11 | .10 | .08 | .08 | .09 | .09 | .08 | .13* | .13* | .13* | .14* | .12* |
| 25. Group performance 2008 | 0.67 | 0.17 | .17** | .15** | .18** | .18** | .13* | .24** | .25** | .26** | .26** | .19** | .35** | .37** | .36** | .39** | .39** |

(Continues)

TABLE 1 (Continued)

| Variable | M | SD | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|----------------------------|------|------|-------|-------|-------|-------|-----|-------|-------|-------|-------|----|
| 26. Gender diversity 2004 | 0.13 | 0.12 | - | | | | | | | | | |
| 27. Gender diversity 2005 | 0.14 | 0.12 | .78** | - | | | | | | | | |
| 28. Gender diversity 2006 | 0.14 | 0.11 | .58** | .73** | - | | | | | | | |
| 29. Gender diversity 2007 | 0.14 | 0.12 | .50** | .61** | .80** | - | | | | | | |
| 30. Gender diversity 2008 | 0.13 | 0.13 | .39** | .47** | .59** | .69** | - | | | | | |
| 31. Group performance 2004 | 1.15 | 0.39 | -.04 | -.06 | -.07 | .01 | .03 | - | | | | |
| 32. Group performance 2005 | 0.80 | 0.34 | -.06 | -.03 | -.02 | .01 | .01 | .45** | - | | | |
| 33. Group performance 2006 | 0.87 | 0.41 | -.02 | -.02 | -.03 | -.01 | .00 | .31** | .36** | - | | |
| 34. Group performance 2007 | 0.72 | 0.38 | .02 | .03 | -.01 | .04 | .08 | .34** | .28** | .29** | - | |
| 35. Group performance 2008 | 0.67 | 0.17 | -.04 | -.02 | -.00 | .06 | .05 | .42** | .40** | .38** | .55** | - |

* $p < .05$. ** $p < .01$.

product term between group size and gender diversity was not related to the slope of group performance ($b = 0.04$, $t = 0.71$, $p = 0.94$). Hypothesis 4 was not supported. The slope of gender diversity was also not related to the slope of group performance ($b = -0.043$, $t = 0.26$, $p = 1.00$).¹

5 | DISCUSSION

Diversity research has long overlooked the possibility that group composition and diversity can change over time as new members join and/or existing members leave the group. In this study, we studied how group becoming more diverse over time (i.e., diversification) affected group performance change in an adverse task environment. We found that organizational tenure diversification and gender diversification benefited group performance change by reducing group performance decline in the adverse task environment. Group size increase attenuated the preventative benefit of organizational tenure diversification but not that of gender diversification. This study offers several important implications for group diversity research.

5.1 | Theoretical implications

First, this study extends diversity research from a static theoretical space about group being diverse (over time) to a dynamic one about

¹To test the potential reciprocal relationships between diversity and performance, we ran two sets of additional analyses. In the first set, we tested two panel regressions with SEM. In the first one, we tested whether performance was predicted by diversity. In this SEM, we regressed (a) 2004 performance on 2004 group size, 2004 organizational tenure diversity, 2004 organizational tenure mean, and 2004 gender diversity, (b) 2005 performance on the four predictors in 2005 and 2004, (c) 2006 performance on the four predictors in 2006, 2005, and 2004, (d) 2007 performance on the four predictors in 2007, 2006, 2005, and 2004, and (e) 2008 performance on the four predictors in 2008, 2007, 2006, 2005, and 2004. In this way, we tested whether performance in one year was predicted by the four group compositional predictors in the current and all the previous years. The model fit of this SEM is insufficient $\chi^2(50) = 273.95$, CFI = .96, RMSEA = .13, 90% CI [.12, .15]. In the second panel regression, we tested whether group composition (including diversity) was predicted performance. In this SEM, we regressed (a) 2004 group size on 2004 performance, (b) 2005 group size on performance in 2005 and 2004, (c) 2006 group size on performance in 2006, 2005, and 2004, (d) 2007 group size on performance in 2007, 2006, 2005, and 2004, and (e) 2008 group size on performance in 2008, 2007, 2006, 2005, and 2004; then, the same regressions were applied to organizational tenure diversity and performance in the five years, organizational tenure mean and performance in the five years, and gender diversity and performance in the five years. In this way, we tested whether group compositional factors in one year was predicted by performance in the current and all the previous years. The model fit of this SEM is also insufficient $\chi^2(230) = 5671.68$, CFI = .16, RMSEA = .30, 90% CI [.30, .31] and much worse than that of the previous one. In the second set of additional analyses, we tested the reverse model to our hypothesized one (i.e., diversity change was predicted by performance change) with LGM. We regressed the slopes of group size, group organizational tenure mean, group organizational tenure diversity, and group gender diversity on the slope of group performance over the five years. The model fit of this LGM is $\chi^2 = 905.158$, $df = 282$, CFI = 0.899, RMSEA = 0.0927, which slightly falls short of Hair and colleagues' (2014) suggestion for the cut-off values for large samples and complex models, that is, CFI > 0.92 and RMSEA < 0.08 for samples with more than 250 data points (our data point is 1395 = 279 groups \times 5 years). In contrast, our hypothesized LGM in which performance change was predicted by performance change did meet with these model fit criteria.

Taken together, a consistent pattern in these additional analyses suggests that it is more likely the case that diversity predicts performance, as we have hypothesized, than the reverse case that performance predicts diversity.

TABLE 2 The distributions of groups across the change trajectories for the included constructs (N = 279)

| | Group size | Organizational tenure diversity | Organizational tenure mean | Gender diversity | Group performance |
|------------|-------------|---------------------------------|----------------------------|------------------|-------------------|
| Increasing | 171 (61.3%) | 235 (84.2%) | 235 (84.2%) | 107 (38.4%) | 93 (33.3%) |
| Decreasing | 65 (23.3%) | 40 (14.3%) | 43 (15.4%) | 65 (23.4%) | 184 (65.9%) |
| Unchanged | 43 (15.4%) | 4 (1.4%) | 1 (0.4%) | 107 (38.4%) | 2 (0.7%) |
| Total | 279 (100%) | 279 (100%) | 279 (100%) | 279 (100%) | 279 (100%) |

Note: The categorization is based on the data in 2005 and 2007.

TABLE 3 Latent growth modeling results of the impact of group diversification on group performance change from 2004 to 2008 (N = 279)

| | Group performance | | | | | |
|--|-----------------------|-------------------|-----------------------|-------------------|-----------------------|-------------------|
| | Model 1 | | Model 2 | | Model 3 | |
| | Intercept <i>b</i> | Slope <i>b</i> | Intercept <i>b</i> | Slope <i>b</i> | Intercept <i>b</i> | Slope <i>b</i> |
| Group size_intercept | 0.01 | | 0.03** | | 0.00 | |
| Organizational tenure diversity_intercept | 0.01 | | 0.06* | | 0.01 | |
| Organizational tenure mean_intercept | 0.03** | | 0.03** | | 0.03** | |
| Gender diversity_intercept | 0.19 | | 0.06 | | −0.00 | |
| Group size × organizational tenure diversity_intercept | | | −0.01* | | | |
| Group size × gender diversity_intercept | | | | | 0.01 | |
| Group size_slope | | 0.00 | | 0.02** | | −0.00 |
| Organizational tenure diversity_slope | | 0.03† | | 0.06** | | 0.02† |
| Organizational tenure mean_slope | | 0.02* | | 0.02* | | 0.02** |
| Gender diversity_slope | | 0.18* | | 0.19* | | 0.04 |
| Group size × Organizational tenure diversity_slope | | | | −0.01* | | |
| Group size × gender diversity_slope | | | | | | 0.04 |
| R ² | .25 | .33 | .32 | .56 | .25 | .25 |
| χ ² | 718.76 | | 1165.20 | | 1044.63 | |
| df | 254 | | 354 | | 358 | |
| CFI | .96 | | .96 | | .96 | |
| RMSEA | .08 | | .09 | | .08 | |

†*p* < .10.

p* < .05. *p* < .01.

group becoming diverse over time. By revealing a novel preventative benefit of group diversification in an adverse task environment, this study extends the (conditional) beneficial view of diversity from the scope of stable to dynamic group composition. More importantly, this study points to a novel theoretical account for the effect of diversity change, which is different from that for the changing effect of unchanged diversity as in the prior research. What is known previously is: With the *same* members in a diverse group, the detriment of diversity on performance diminishes over time, because members can learn more about each other over time and this reduces the detriment of social categorization and allows the benefit of information processing to merge over time (Chatman & Flynn, 2001; Earley & Mosakowski, 2000; Harrison et al., 1998, 2002; Pelled et al., 1999; Schippers et al., 2003).

However, in the realm of dynamic group composition, new members join and/or existing members leave the group from time

to time. This means that the condition of same members in a (diverse) group over time is unmet, and thus the mechanisms of members learning more about each other, social categorization diminishing, and information processing emerging over time are all called in question. Integrating the open systems perspective of groups and the contingency approach to diversity, what we have proposed and found evidence for is a *sustaining* performance benefit of information processing as groups become more diverse over time via membership change. This is because expansion in member differences via membership change helps to keep all members alert to their (expanded) differences over time. In an adverse context where information processing and member collaboration are needed for group adaptation and performance, such alertness helps to keep group information processing vital and thus benefits group adaptation and performance over time. While static diversity research suggests that with the same and dissimilar members in the group,

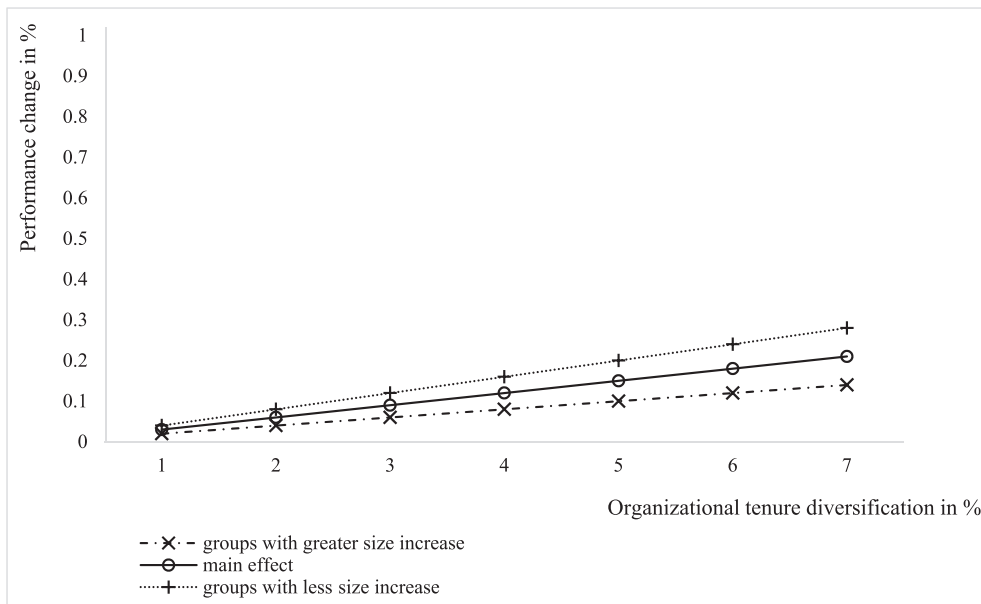


FIGURE 2 The interactive effect of organizational tenure diversification and group size increase on group performance change

information processing and its benefit appear only *later* in time, our study suggests that information processing and its benefit keep being simulated over time by dissimilar members joining and/or similar members leaving the group. In doing so, our study resonates with the advocacy that dynamics theory and statics theory are distinct in nature and rest upon distinct mechanisms (Van de Ven, 2007) and that what holds for static cross-sectional comparisons between diverse and homogenous groups may not be translated directly to understand the performance implications of group becoming more or less diverse than themselves over time (Mathieu et al., 2017). Hence, our study adds a unique and novel theoretical insight into diversity research.

Specifically, we found that the performance benefit of organizational tenure diversification is independent of that of organizational tenure mean increase. This points at the unique values of the two compositional changes through distinct mechanisms. Whereas the benefit of organizational tenure mean increase may lie in the improved *availability* of tenure-related knowledge in the group (i.e., increased amount per person), the benefit of organizational tenure diversification is likely due to the improved *distribution* of such knowledge (i.e., the expanded gap among members) - this further stimulates member sharing and seeking of tenure-related knowledge in the group and enhances group adaptation and performance in an adverse task environment (also see Gavin & Greenhaus, 1976; Ng & Feldman, 2010; Steffens et al., 2014; Valle et al., 2004). Altogether, this finding extends the contingency approach to diversity from being diverse to becoming diverse and reveals a *sustained* performance benefit of group becoming more diverse in organizational tenure over time in an adverse task environment. Even without introducing additional amount of knowledge to the group, re-configuring knowledge distribution in the group via membership change alone can help to sustain group information processing and its performance benefit over time.

Moreover, although the preventative benefit of organizational tenure diversification can emerge from the three forms of membership change, the attenuation of group size increase suggests that the benefit is smaller when diversification is via member addition than via member replacement and departure or when more members are added or fewer members depart. This is because information sharing, cooperation, and morale are generally lower in larger groups (Amason & Sapienza, 1997; Bradner et al., 2005; Gersick & Hackman, 1990; Rentsch & Klimoski, 2001). This finding further implies that when adversity strikes, the most effective way to reduce group performance decline is for shorter-tenured members to leave the group, because it increases both the group mean and diversity of organizational tenure but decreases group size. However, if the group initiates such member departure (i.e., the group decides to remove shorter-tenured members), it is cautionary that downsizing has equivocal effectiveness (Datta, Guthrie, Basuil, & Pandey, 2010).

The preventative benefit of gender diversification in male-predominant groups may stem from the improved distribution and utilization of the full spectrum of knowledge, skills, and competences carried by both male and female members in the group. These include previously underappreciated attentiveness to environmental changes, customer needs, and budget constraints and practice of participative decision-making (Bass & Avolio, 1994; Eagly et al., 2003; McGregor & Tweed, 2001), which are all important for the group to deal with the changing task demands and adapt in an adverse task environment (Christian et al., 2017). We did not find the attenuation of group size increase on the preventative benefit of gender diversification. One potential explanation for this could be that the effect of gender diversity on performance is more likely in large groups (13 to 25 members) than in small groups (fewer than 12 members, Wegge, Roth, Neubach, Schmidt, & Kanfer, 2008). The average group size in this study ranges from 8.82 to 10.04 in the five years and thus is all relatively small. This may explain the lack of the moderation effect of group size change on

the beneficial effect of gender diversification on group performance change. Altogether, this finding extends the contingency approach to gender diversity from the scope of stable to dynamic group composition. That is, when the context accentuates the need for information processing and member collaboration, becoming more gender diverse in male-predominant groups via membership change helps with group innovation, adaptation, and performance in the adverse task environment.

Second, this study adds important nuances to dynamic group composition research that suggests mixed effects of group membership change on group performance (e.g., Arrow & McGrath, 1993, 1995; Ziller, Behringer, & Goodchilds, 1962; also see Humphrey & Aime, 2014; Mathieu et al., 2014). Our study suggests that adding, replacing, or losing members in and of itself is no guarantee of group performance improvement, as the main effect of group size change is non-significant. Instead, the value of group membership change depends on the specific characteristics of changed members (Mathieu et al., 2014, 2017) and, correspondingly, on the specific changes in the specific aspects of group composition. For example, we found that, only when group membership change is associated with an increase in group organizational tenure diversity, will it benefit group performance change. By carefully choosing whom—and how many members—to add and/or remove with respect to organizational tenure, groups can reduce the degree of performance decline when facing an adverse task environment. The prior dynamic group composition research almost exclusively focuses on member knowledge related to the task content, involves newcomers, and relies on laboratory groups that typically perform cognitive tasks in hour-long sessions. We broaden the scope of this research by including member knowledge that does not speak directly to the task content yet can benefit group performance. We also include the case in which groups diversify without the joining of new members (i.e., diversification via member departure) and have studied field work groups over years. Altogether, this study offers externally valid guidance for organizational practitioners to re-compose work groups.

Third, a perhaps broader and remoter contribution of this study is that it delineates a conceptual framework to further examine the relationship between diversity change and performance change, which is consistent with the open systems perspective of groups (Hackman, 2012; Katz & Kahn, 1978; McGrath et al., 2000). From this perspective, performance is a dynamic output of group work, and its trajectory is a joint product of the trajectories of group inputs, throughputs, and externalities. Consistently, there are four conceptual meanings for the two dynamic relationships between diversity and performance: A positive dynamic relationship implies (a) *enhance benefits* with greater diversification corresponding to greater performance improvement or (b) *preventative benefits* with greater diversification corresponding to less performance decline (what is found in this study). A negative dynamic relationship implies (c) *aggravating detriments* with greater diversification corresponding to greater performance decline or (d) *suppressive detriments* with greater diversification corresponding to less performance improvement. Although our study reveals only the preventative benefit of diversity change on performance change, this

broad conceptual framework may be helpful to guide future diversity research into a novel area about diversity change, especially given that dynamics theory is more nuanced and complex than statics theory (Mathieu et al., 2017; Van de Ven, 2007). For example, will diversification benefit or harm group performance change in a *favorable* task environment (when the higher-level context presents a *possibility* for group performance growth)? In what conditions will each of the four possible manifestations of the two dynamic relationships be strengthened or weakened? It is theoretically valuable to further study how change in group diversity affects (change in) group processes, states, and performance and thereby advance diversity research along the temporal-dynamic avenue (Li et al., 2018; Li & van Knippenberg, 2020; Mathieu et al., 2014, 2017; van Knippenberg & Mell, 2016).

5.2 | Practical implications

This study provides guidance to organizational practitioners who may resort to changing members to improve group performance in times of crisis. Our findings suggest that organizations could consider how adding, rotating and/or removing members would affect group diversity and thus stimulate group processes that may benefit group performance. For example, apart from content-related expertise, organizational tenure and gender might be relevant attributes to consider in deciding upon member addition, replacement, and removal. Generally, adding members with longer or shorter organizational tenure and/or removing members with average organizational tenure may improve group performance. In male-predominant groups, increasing female representation in adverse times might help groups to reduce performance decline. Simply expanding or downsizing groups will not lead to group performance improvement unless such membership changes increase group organizational tenure diversity.

5.3 | Limitations and future research

Our study has three major caveats. First, the dynamic relationship between group diversity and group performance is examined on the yearly basis. Smaller measurement scales (e.g., quarterly and monthly) may provide more nuanced insights into this dynamic relationship (Zaheer, Albert, & Zaheer, 1999). Second, the findings should be conservatively generalized to other group types that perform conjunctive tasks rather than additive tasks (Steiner, 1972). Although the task interdependence of the consultant groups is moderate and present in some aspects of the group work (e.g., collective handling of large and complex deals, obtaining advice and help from colleagues before meeting clients, and weekly group meetings for discussing group-level issues and individual questions), each member's contribution to group performance is proportionate to his or her individual performance, and the group does not have group-based rewards. It is important for future research to examine diversification in groups with different task types and different degrees of task interdependence. Lastly, given the data constraints, we did not test the mediating mechanisms

of information processing and innovation-based adaptation. We see exploring potential mediators a necessary step to advancing research on group diversification. Altogether, despite these limitations, this study makes valuable contributions to group research by revealing a novel preventive benefit of group becoming more diverse over time and by outlining group diversification as an important avenue to advance diversity research.

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