We examined the relationship between team task knowledge diversity and team creativity, and the moderating role of team status inequality, with a focus on organizational tenure and rank inequality. By adopting an input–process–output framework, we hypothesized that teams would achieve high levels of creativity when they have a large pool of task-relevant expertise that is differentiated and specialized among team members, but the relationship would be weakened when team members have different statuses. We tested our hypotheses using data from 325 teams of employees at 10 companies in South Korea. Results showed that task knowledge diversity was positively associated with team creativity and a team’s status inequality in terms of organizational tenure moderated the relationship in a negative way. Our findings contribute to the literature on team creativity by providing new insights regarding how status inequality, which is almost ubiquitous in workplaces, plays a role in a dynamic team process for creativity.

Keywords: task knowledge diversity, team creativity, status inequality, organizational tenure, rank.
With the growing significance of creativity for organizations’ success and the increasing popularity of working in teams, much research effort has been exerted on the relationship between diversity and team creativity (van Knippenberg & Hoever, 2017). Drawing on an information/decision-making perspective, Williams and O’Reilly (1998) claimed that diversity of team members’ knowledge and skills creates a larger pool of resources and provides improved team performance including team creativity. However, there has not been consistent evidence of this relationship (Hülsheger, Anderson, & Salgado, 2009; van Knippenberg & Hoever, 2017).

To reconcile prior inconsistent research results on the diversity–team performance relationship, Joshi and Roh (2009) claimed that the group process dynamics in the diversity–team performance relationship and the contextual factors that may affect the relationship should be carefully examined. Therefore, we believed that detecting important contextual factors that may facilitate or constrain the enactment or effectiveness of group processes seems critical to refine understanding of the nature and mechanism of team creativity.

Further, team member diversity can be interpreted as a separation, variety, or disparity of members (Harrison & Klein, 2007), but Van Dijk and Van Engen (2013) pointed out that in prior research on diversity and team performance, consideration of disparity of members and status-related group process has been omitted. Inequality of team members may affect the attitude and behaviors of group members’ decision-making process (Buyl, Boone, Hendriks, & Matthyssens, 2011) and thus, omitting consideration of disparity within a team could limit understanding of the diversity–team creativity relationship.

Therefore, we aimed to expand on existing knowledge on team creativity by examining the role of status inequality within a team, such that, the team’s diverse task knowledge is integrated and realized as team creativity. We suggested team’s status inequality as a contextual factor that may constrain the motivations and opportunities of team members to share their unique ideas and information. Like prior researchers, we defined status as “an individual’s social standing or rank order among others within a social system, which is based on prestige, prominence, and respect” (Christie & Barling, 2010, p. 920). We defined status inequality as the degree of inequality in status positions among a group of individuals. How individual members engage in team interactions may depend on their relative status, or the social power and resources associated with their status within the team. For instance, Buyl and her colleagues (2011) showed that the status of the chief executive as a founder negatively affected the relationship between top management team (TMT) functional diversity and firm performance.

We focused on the creativity of work teams in the various functional areas (i.e., departments, work units), rather than on the creativity of the TMT. As well as TMTs and cross-functional-area project teams, work teams in specific functional
areas, where members are likely to be similar in educational and/or functional backgrounds, but could be different in task-relevant skills and knowledge accrued from their work and life experiences, are also expected to be creative in their task completion. Thus, more research on the diversity–team creativity relationship in these teams is needed (Wang, Kim, & Lee, 2016). Further, we focused on the role of the status disparity structure of work teams in creativity, which could be more diverse than the status configuration of TMTs.

**Literature Review and Hypotheses**

**Task Knowledge Diversity and Creativity Potential**

For most studies on the creativity of teams or groups, an input–process–output (I–P–O) framework (Nijstad, Rietzschel, & Stroebe, 2006) has been utilized (e.g., Madrid, Totterdell, Niven, & Barros, 2016; Pavitt, 2014). According to the I–P–O view, a team’s creativity potential depends on the diversity of the task-related resources of each team member (Williams & O’Reilly, 1998). When team members have diverse and nonredundant resources necessary for a task, the creativity potential of the team as a unit would be higher than that of an individual member. However, if the resources of each member in a team that are relevant to the creativity task are similar and redundant, the group creativity potential would not differ much from that of an individual member.

We focused on teams’ *task knowledge diversity* and conceptualized this as the degree to which a team’s reservoir of task-relevant knowledge and skills is distributed and specialized among team members (Zhang, Hempel, Han, & Tjosvold, 2007). Amabile (1983) maintained that *domain skills*, such as specialized technical knowledge and skills, and talent in the particular domain of the task, as well as *creativity skills*, such as cognitive style and knowledge of creative heuristics, are important for generating new and useful ideas. Thus, for a team to achieve creativity, the knowledge reservoir should be diverse and relevant to the task domain. Each team as a unit may pursue team creativity under the assigned task domain, and members’ educational or occupational backgrounds may not necessarily be relevant to the team’s task domain. When we considered the points in this line of reasoning together, we proposed that a team’s creativity performance would be higher when the reservoir of knowledge relevant to the task domain is distributed and specialized among individual team members rather than when all team members share common task-relevant knowledge.

**Hypothesis 1:** Teams’ task knowledge diversity will be positively associated with team creativity.

**Team Status Inequality and Team Creativity**

Processes of creativity realization. In the I–P–O framework, a group’s creativity potential generated by the group members’ inputs is realized as a
group outcome through the group processes wherein the members interact to share and generate ideas and make decisions (Nijstad et al., 2006). The diversity of task-relevant resources determines the creativity potential of a team, but the quality and quantity of team creativity depend on the effectiveness of the group processes. Therefore, focusing only on the antecedents of a team’s creativity potential may result in an incomplete understanding of the nature of team creativity.

The gains from a group’s resource diversity are achieved only when each group member’s unique knowledge and ideas are shared effectively and the group engages in divergent thinking. However, the effective sharing of unique knowledge and ideas depends on each member’s motivation and opportunities to share. We examined how members’ status inequality within a team affects the effectiveness of the group processes for team creativity (Hypotheses 2 and 3).

**Formal and informal status hierarchy.** There can be various types and forms of status hierarchies within a team, and the team members’ status perception may be a multifaceted higher level construct consisting of multiple components (e.g., Christie & Barling, 2010). We focused on rank- and tenure-based inequalities within a team. We believe that these are two of the most salient and universally existing status hierarchies across work teams, and rank and tenure may be interrelated, as employees who are relatively higher in rank tend to have longer organizational tenure than employees who are lower in rank. Also, highly ranked individuals or those with long organizational tenure likely possess more knowledge, skills, experience, and information about task domains and are often considered experts, and are respected, by other organizational members.

However, the origins and characteristics of rank and organizational tenure are different as *rank* is a formal status with authority conferred by the formal organizational structure (Schminke, Cropanzano, & Rupp, 2002), whereas *organizational tenure* can be a type of informal status that is based on a temporal component of organizational life (Kassing & Armstrong, 2001). The status of highly ranked employees stems from the authority and the span of discretion formally endowed by the organization. On the other hand, employees with longer tenure are likely to have more social power conferred by their wide webs of social ties within the organization (Mehra, Kilduff, & Brass, 2001) and possess more information on organizational context (Rollag, 2004). Therefore, we distinguished the individual’s status based on rank from that based on tenure, and separately examined the effects of the two types of status inequalities on the relationship between a team’s task knowledge diversity and team creativity.

**Process loss under status inequality.** We reasoned that when status inequality exists within a team, lower status members’ motivations and opportunities to share unique ideas may be constrained. First, lower status members may be reluctant to share their unique ideas and information for fear of negative
evaluations by higher status members. Lower status members may believe, or expect, that the higher status members have more expertise, experience, and knowledge on the focal discussion topics as the latter are believed to have achieved their higher status because of their expertise and knowledge resources (Kassing & Armstrong, 2001; Rollag, 2004). In addition to their fear of negative evaluation from higher status members, lower status members may not even think about speaking up simply because they think opinions of higher status members are superior to theirs, and that they have nothing of value to contribute (Kish-Gephart, Detert, Trevino, & Edmondson, 2009).

Second, lower status members may withhold their unique and valid knowledge and ideas simply because they do not get opportunities to speak (Ritchie, 2012). We reasoned that, as work teams often engage in team activities under time constraints, lower status members may not be invited to contribute to critical decision-making processes. Even when they participate in decision-making processes, the opportunities for lower status members to speak may be more limited than those of higher status members. Repeated exclusion of lower status members from team decision-making processes may induce those members to believe that their ideas are not valuable, and to view voicing their opinions as a violation of behavioral expectations or norms, resulting in negative consequences for them (Ritchie, 2012). Although lower status members’ ideas could often be valuable input for team creativity, lower status members’ limited opportunities to voice, and perception of threat or risk associated with speaking up freely can deter their willingness to share unique ideas (Anderson & Berdahl, 2002).

Third, lower status members may engage in impression management behaviors (Bolino, Long, & Turnley, 2016) toward higher status members by avoiding dissenting from the ideas of higher status members and providing only commonly held ideas and knowledge that support the higher status members’ suggestions. When team members exchange only similar ideas, mutual cognitive stimulations that encourage team members to contribute redundant ideas may accelerate convergent thinking and the quality and quantity of the team creativity outcome may decrease (Coskun, 2005).

On the other hand, higher status members’ motivation to share their unique knowledge and ideas may also be negatively affected by status inequality within a team. First, higher status members may engage in free-riding or social-loafing behavior by withholding their unique opinions (Price, Harrison, & Gavin, 2006). During group processes in which members’ knowledge and ideas are shared and mixed to generate new ideas, how much each of the members contributes to group outcomes tends not to be precisely quantifiable, and higher status members may feel more comfortable than lower status members to free ride.

Second, higher status members may skip group discussion and knowledge sharing with lower status members because of time constraints and negative
stereotyping that involves an expectation that lower status members will only contribute redundant ideas or will remain silent (Ritchie, 2012). Higher status members may assume that the opinions and feedback from the high status—and, thus, talented—members are worth paying attention to, but the opinions and feedback from low status members are not, especially given time constraints.

Therefore, when status inequality exists within a team, the team members’ motivation and opportunities to share unique knowledge and ideas may be constrained, and the members may engage in convergent thinking that limits the realization of team creativity potential. We formed the following hypotheses:

**Hypothesis 2:** Team status inequality in terms of organizational tenure will negatively moderate the relationship between a team’s task knowledge diversity and team creativity.

**Hypothesis 3:** Team status inequality in terms of organizational rank will negatively moderate the relationship between a team’s task knowledge diversity and team creativity.

### Method

**Participants and Procedure**

We collected data from members of 492 teams employed at 10 Korean companies in the machinery, transportation, construction, heavy manufacturing, and energy industries. Teams ranged in size from three members to 54 ($M = 8.82$, $SD = 7.29$). We conducted the research strictly according to the research ethics policy of the Seoul National University. A link to an online informed consent form and an online survey were sent to the target participants’ company email addresses. Participants were guaranteed confidentiality and assured that their participation was voluntary. The team leaders’ ratings of team creativity were missing for some teams, and thus, the final usable sample size was 325 teams. The teams performed one of seven different functional tasks: a) administration, b) business development, c) design, d) operation management, e) production technology, f) research and development, or g) sales, which provided an opportunity to examine the factors and mechanisms influencing team creativity within a representative context of work teams. The two dominant functional task types that accounted for more than 50% of the sample were production technology and sales. Among respondents, 88% were men, and 97.2% had at least some college-level education. The average age was 32.66 years (range = 18–58 years; $SD = 5.67$ years). The average company tenure was 4.56 years (range = 1 month to 34 years; $SD = 4.43$ years). Survey instruments were prepared in Korean after an iterative translation process was performed by three bilingual graduate students under the supervision of the first author to ensure that the original meaning remained intact (Brislin, 1980).
Measures

**Team creativity.** Consistent with previous research we measured this variable using four items adapted from an individual creativity measure developed by Zhou and George (2001). Team leaders were asked to indicate, on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree), the level of creativity of their teams. The items were “My team suggests new ways to achieve goals or objectives,” “My team comes up with new and practical ideas to improve performance,” “My team often has new and innovative ideas,” and “My team often has a fresh approach to problems.” We averaged the responses to the four items to create a measure of team creativity. Cronbach’s alpha was .95.

**Task knowledge diversity.** Whereas previous diversity researchers have often used team members’ educational backgrounds to create a team-level heterogeneity index (e.g., Blau’s Index of Heterogeneity; Blau, 1977), we used a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree) to directly measure team members’ perception of their team’s level of specialized knowledge in different areas that are required for the completion of projects. We used items in a transactive memory system specialization subscale to measure the specialized dimension of transactive memory system, adapted from Zhang et al., (2007), to assess the extent to which members of teams had specialized and differentiated knowledge about the task. The original subscale had five items, but we dropped one item regarding the participant’s knowledge about who in the team has expertise in certain areas because it was not relevant to the purpose of our research. The Cronbach’s alpha for this measure was .87. To justify the aggregation of individual team members’ responses, we computed a value for within-group agreement, $r_{wg}(J)$, and the mean $r_{wg}(4)$ was 0.84. In addition, we performed one-way analyses of variance to determine the between-group variance of the variable, and the $F$ value was found to be statistically significant ($p < .05$), indicating consistent group-level differences.

**Team status inequality.** Consistent with our conceptualization and others’ recommendations about appropriate indices to capture the disparity attribute within a group (Bedeian & Mossholder, 2000), we computed the coefficient of variation of two indicators of status: that is, organizational tenure and rank. The psychometric properties of the coefficient of variation (in particular, the fact that it is a scale-invariant measure) are preferred over the standard deviation (Allison, 1978). Organizational tenure was calculated by the number of years employees had worked in the organization based on information regarding when they entered the organization. Rank information was acquired from the employee records managed by the human resources department of each company. Although names of the positions were different across teams depending on the types of tasks performed (e.g., sales team versus production technology team), we were able to find a system of ranks that was consistent and applicable to
all teams. Most teams had six positions in the rank of hierarchy except for the research and development teams, which had only four levels. We coded the ranks using numbers from 1 to 6 (1 to 4 for the research and development teams). We believe that the difference between two hierarchical structures should not be a concern because we computed the coefficient of variation, which is a normalized, unit-free measure.

Control variables. Following the recommendations of Becker et al. (2016), we empirically examined the relationships between potential control variables (i.e., sociodemographic variables) and our dependent variable (i.e., team creativity). Of our potential control variables, only team size, team task type, and company dummies were correlated with team creativity (dependent variable). Therefore, we included team size and dummy variables for types of team task and companies as controls in our subsequent analyses.

Results

We used ordinary least squares (OLS) analysis to test the hypotheses. We ran diagnostics for multicollinearity among principal variables. The values of tolerance and variance inflation factor (VIF) were, respectively, 0.98 and 1.03 for task knowledge diversity, 0.89 and 1.13 for tenure-based status inequality, and 0.89 and 1.13 for rank-based status inequality. When the control variables (team size, task-type dummies, and company dummies) were entered in the regression model, the values of tolerance ranged from 0.74 to 0.85 and the values of VIF ranged from 1.18 to 1.34. To minimize any potential problems of multicollinearity, we standardized the predictor variables prior to creating interaction terms.

Table 1 contains a summary of the results of OLS regression analyses. In support of Hypothesis 1, the coefficient of task knowledge diversity was statistically significant and positive (see Model 1), and the main effect was significant and positive in all following models. To test Hypothesis 2, we entered the interaction term of task knowledge diversity and tenure-based status inequality in Model 3 and the results document a significant interaction effect for tenure-based status inequality on team creativity. However, as indicated in Model 5, the coefficient associated with the interaction term of task knowledge diversity and rank-based status inequality was not statistically significant, thus failing to support Hypothesis 3. In Model 6, the results show a marginally significant coefficient only for the interaction term of task knowledge diversity and tenure-based inequality when two interaction terms were entered together.

Simple slopes were calculated at one standard deviation and below the mean of tenure-based status inequality and simple slope test results confirmed that the slope for the relationship between task knowledge diversity and team creativity was significantly different from zero when tenure-based status inequality
was low (β = .28, t = 3.93, p < .01), suggesting that task knowledge diversity contributes to enhancing team creativity when teams are characterized by low tenure-based status inequality.

Table 1. Regression Analysis Results

<table>
<thead>
<tr>
<th>Control variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task knowledge diversity</td>
<td>.14*</td>
<td>.18**</td>
<td>.20**</td>
<td>.17**</td>
<td>.17**</td>
<td>.19**</td>
</tr>
<tr>
<td>Organizational tenure-based inequality</td>
<td>.03</td>
<td>.03</td>
<td>.04</td>
<td>.03</td>
<td>.04</td>
<td>.06</td>
</tr>
<tr>
<td>Rank-based inequality</td>
<td>-.07</td>
<td>-.07</td>
<td>-.06</td>
<td>-.07</td>
<td>-.07</td>
<td>-.06</td>
</tr>
<tr>
<td>Two-way interaction terms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task knowledge diversity × organizational tenure-based inequality</td>
<td>-.14*</td>
<td>-.13+</td>
<td>-.14*</td>
<td>-.13+</td>
<td>-.13+</td>
<td>-.13+</td>
</tr>
<tr>
<td>Task knowledge diversity × rank-based inequality</td>
<td>-.06</td>
<td>-.06</td>
<td>-.06</td>
<td>-.01</td>
<td>-.01</td>
<td>-.01</td>
</tr>
<tr>
<td>F statistics</td>
<td>1.44</td>
<td>1.54+</td>
<td>1.74*</td>
<td>1.59+</td>
<td>1.56+</td>
<td>1.61*</td>
</tr>
<tr>
<td>Model R²</td>
<td>.07</td>
<td>.09</td>
<td>.10</td>
<td>.09</td>
<td>.09</td>
<td>.11</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.02</td>
<td>.03</td>
<td>.04</td>
<td>.03</td>
<td>.03</td>
<td>.04</td>
</tr>
</tbody>
</table>

Note. Dummies for task types and companies were included in the analysis as a control. Standardized regression coefficients are shown.

Discussion

Our findings provide support to our claim that a team’s task knowledge diversity enhances team creativity, and this is consistent with prior research on the relationship between knowledge-based diversity and team creativity (e.g., Wang et al., 2016). A finding that we believe is more important was that, in terms of organizational tenure inequality, members’ status inequality in a team negatively affects the relationship between task knowledge diversity and team creativity, which is consistent with the implication in findings in prior research on the role of chief executive power status in the TMT diversity–firm performance relationship (Buyl et al., 2011). Teams with diverse task-relevant knowledge and expertise are able to realize greater team creativity because they have greater creativity potential to begin with, but team status inequality can weaken the positive effect of a team’s task knowledge diversity on team creativity. Specifically, in our study teams with high status inequality achieved a lower level of team creativity, even with a wide range of diverse task knowledge. This means...
that high status inequality within teams may restrict the creativity processes by making team members withhold their efforts, which, in turn, reduces the team’s productivity in generating creative ideas. Conversely, when teams consist of members with similar status, this is likely to create an environment that can help individuals fully engage in creative processes in a way that best utilizes their collective knowledge resources.

With these findings we have made several contributions to the literature on team creativity. First, we have revealed a new mechanism of the team creativity process by suggesting, and examining, team status inequality as a contextual factor that negatively moderates the relationship between task knowledge diversity and team creativity. Second, our findings extend understanding of the nature of team creativity by delineating a team process for creativity through which a team’s creativity potential, which is generated by task-knowledge diversity, is realized in the team’s actual creativity performance; although this may not invariably happen, depending on the constraints of the contextual factor of team status inequality. Third, our findings provide further empirical evidence to support the process model of team creativity, with field data from teams employed in various functional areas at Korean companies.

The findings also provide team leaders and human resource managers with practical insights into facilitating team creativity. Team leaders need to equip their teams with diverse expertise to achieve high levels of team creativity. More importantly, team leaders should understand that knowledge diversity does not automatically translate into team creativity. The findings in our study imply that managers need to keep a balance between knowledge-based diversity and homogeneity in terms of status in a team in order to minimize creativity loss that can be caused by status differentials within the team. Further, as indicated by our results, managers may need to pay more attention to team members’ informal status, such as organizational tenure, rather than to their formal status, such as rank. If the structure of differential status within a team is a given constraint beyond the discretion of team leaders or managers, the leaders/managers should consider empowering subordinates and fostering participatory climate, so that team members can understand that their participation can be a meaningful contribution, and feel comfortable to voice their ideas (Ritchie, 2012). Also, if team leaders employ practices designed to facilitate effective idea sharing and divergent thinking among team members (e.g., the devil’s advocate approach; Kelley & Littman, 2005), this may help overcome structural constraint.

This study has some limitations. First, it was conducted in Korea and this may limit the generalizability of our findings. Future researchers could further generalize our findings by conducting research in the context of a culture with different characteristics. Second, although we adopted the I-P-O framework and delineated the group process of idea generation to suggest team status inequality
as a new contextual factor, we did not directly examine the idea sharing process in the team. Multilevel studies in which the method used allows researchers to examine team members’ idea-sharing intention and participation under various team context factors could address this limitation. Third, we measured team status inequality based on only the two factors of organizational tenure and rank. Future researchers need to test other measures of status, such as age, team tenure, and an individual’s perception of his/her own status within a team.

Nevertheless, we have provided empirical evidence of the moderating role of status inequality within a team in the relationship between task knowledge diversity and team creativity. We also delineated the influence of teams’ composition of hierarchical status on the team creativity process, and we would encourage future studies on status structure within a team as well as on various team processes for creativity.

References


