Rodríguez-Sánchez, A. M., Devloo, T., Rico, R., Salanova, M., & Anseel, F. (2017). What makes creative teams tick? Cohesion, engagement and performance across creativity tasks: A three-wave study. *Group & Organization Management,* 42 (4), 521-547.

DOI **10.1177/1059601116636476**

Accepted in Group & Organization Management on **04/02/2016**

Abstract

The present study examines the mediational role of collective engagement in the relationship between team cohesion and team creative performance. A reciprocal process was expected to unfold across creativity task episodes: (1) team cohesion leads to collective task engagement, which in turn has a positive effect on team creative performance (perceived team performance and independently rated creativity), and (2) perceived team creative performance predicts the development of future team cohesion. The study relied on a longitudinal three-wave research design through an organizational simulation exercise, in which 118 project teams (605 individuals) were charged with three creativity tasks. This study advances collective task engagement as an important mediational process explaining team performance in creative activities.

Keywords:

Team cohesion; Collective task engagement; Team creative performance; Reciprocal processes

What Makes Creative Teams Tick? Cohesion, Engagement and Performance across Creativity Tasks: A three-wave study

Organizations strive to keep their position in a global and competitive market. They are under constant pressure to make the right decisions to expand their business and to come up with new and exciting products and services. Consequently, such organizations are greatly in need of effective working strategies that may help them to cope with the extremely demanding environment in which they have to operate. A key response to the pressures exerted by this dramatically changing environment is creativity, which has been advanced as a central element for organizational effectiveness (Amabile, 1988; Baer & Oldham, 2006; George, 1990). Not surprisingly, Google, which has become the gold standard for organizational success, advocates for the importance of hiring creative people and facilitating a creative atmosphere at work. According to Ed Catmull (2008), president of Pixar Animation Studios, success is not a matter of luck, but a combination of practices for managing talent and creating collective creativity. What these kind of successful organizations have in common is their reliance on practices that trigger and develop creativity among both their employees and their teams. In fact, teams are increasingly being used as the basic unit of work accomplishment (Hirschfeld & Bernerth, 2008) and, therefore, the basis for organizational success. Thus, understanding how to enhance team creativity is a key issue both for business and research.

Over the past few decades, creativity research has grown exponentially and provides numerous insights on how individual employee creativity can be fostered (Amabile, Conti, Coon, Laznby, & Herron, 1996) and, more recently, how team creativity can be enhanced (Joo et al., 2012). Team creativity has become an issue of utmost importance given the increasing reliance of organizations on project-based teams (i.e., temporary teams charged with a specific task during short amounts of time) to rapidly produce creative outcomes (Gersick, 1988). In this regard, research has taken important steps toward a better understanding of the psychosocial processes leading to team-level creativity (Eisenbeiss, Van Knippenberg, & Boerner, 2008). A meta-analytic

study summarizing 30 years of creativity and innovation research (Hülsheger, Anderson, & Salgado 2009) revealed that team processes (e.g., internal communication, team cohesion and vision) (a) displayed stronger links with creativity than team input variables (e.g., team size, team longevity and background diversity), and (b) better predicted team creativity than individual creativity. Given their proven impact on creativity and innovation, research focusing on the role of team process variables has burgeoned in the last five years (Choi, Sung, Lee, & Cho, 2011; Hu & Randel, 2014; Jia, Shaw, Tsui, & Park, 2014; Sung & Choi, 2012). Particularly, recent research highlights the idea that social integration processes within teams (such as team cohesion) are important for creative and innovative activities as they stimulate positive team member interactions (Hülsheger, et al., 2009; Taggar, 2002). Hence, understanding the dynamics of social processes in team creativity is crucial for research and practice.

Specifically, current insights into the link between cohesion and creative performance seem to suggest an indirect relationship (Hülsheger, et al., 2009; Taggar, 2002). However, the precise dynamics of this relationship remain unclear, thereby calling for more research attention to two key questions that have remained underexplored. First, which intermediate factors can explain the relationship between team cohesion and team creative performance? Second, what timeframe is needed for the interplay between team cohesion and team performance to develop? Little is known regarding this question, particularly in project teams (Nakata & Im, 2010). In fact, a recent review of the innovation literature concluded that only a few studies have examined team innovation processes over time (Anderson, Potocnik, & Zhou, 2014).

In addressing these two questions, we propose a three-wave study to first analyze the mediating role of team engagement (i.e., vigor, dedication, and absorption) as a key motivational mechanism that transmits the effects of team cohesion to team creative performance; and second, to test a reciprocal cycle of cohesion and team creative performance across subsequent task episodes, in order to understand the dynamics of this relationship over time. In line with Mathieu and Button (1992), we define episodes as distinguishable periods of time over which performance accrues.

Task episodes are most easily identified by goals and goal accomplishment periods, and teams pursue just one of them at a time (Marks, Mathieu, & Zaccaro, 2001).

In doing so, this study contributes to what we know about team creativity in different ways. First, we uncover the mechanisms that explain the team cohesion–team creative performance relationship by studying the mediating role of team engagement. Second, by adopting a longitudinal research model, we provide much needed insight on how team creativity develops over time (see for instance the call of Anderson et al., 2014; and call of Shin & Zhou, 2007). Finally, a better theoretical understanding of these dynamics should help practitioners in designing interventions to foster team creativity.

Theoretical background and hypotheses

In accordance with previous research, we conceptualize team creativity as the team production of ideas concerning products or services that are novel and useful (Amabile, 1996; Shalley, 1991). Team creativity emerges from cohesive team characteristics that support open interactions, diverse viewpoints and playful surroundings (Amabile, 1988). Team creativity should be differentiated from team innovation in the sense that creativity refers to the idea generation stage, while innovation also implies the introduction and application within a team of ideas, processes, products, or procedures that are new to the team and are designed to be useful (West & Farr, 1990).

Team cohesion, team engagement and team creative performance

Creativity and innovation research has advanced team cohesion as an important team process variable (Joo et al., 2012; Hülsheger, Anderson, & Salgado, 2009). Team cohesion refers to the extent to which team members are committed to their team, and how well the team is integrated as it pursues its goals (Kozlowski & Ilgen, 2006). It has been argued that team members who have strong feelings of belongingness and feel attached to other team members are more likely to cooperate (Taggar, 2002). This notion of cooperative interdependence among team members has been argued to be crucial for team performance in general (Mathieu et al., 2015) but also, more

specifically, for the production of creative output as a group. Teams with strong cooperative norms make team members more motivated to contribute to the team's collective goal and creative success (instead of pursuing individual goals), for example by constructively discussing and building on each other's ideas (Nijstad & De Dreu, 2012; Tjosvold, 1998). In their meta-analysis, Hülsheger and colleagues (2009) demonstrated that various indicators of cooperation, such as team cohesion and participative safety, are important for creative and innovative activities as they stimulate team members to interact with each other, and facilitate the exchange of ideas within a supportive and non-threatening team atmosphere. Similar results have been reported by Taggar (2002), who showed that aggregated individual-level creativity was positively related to team-level creativity when groups displayed cooperative behavior. Hence, team cohesion can be expected to be particularly important for creative tasks as they rely heavily on knowledge sharing and collaborative behaviors between team members (Nijstad & De Dreu, 2012). Thus, we hypothesize the following:

Hypothesis 1: Throughout the course of a creativity task episode, team cohesion positively relates to team creative performance.

The positive effects of team cohesion on team performance seem to be partially explained by their impact on team motivation to engage in creative activities (Hulsheger et al., 2009). However, the mechanisms through which the relationship between team cohesion and creative team performance occurs remain unclear. On the one hand, cohesive teams have been shown to be more likely to experience a higher sense of coherence and more cognitive conflict and discussion, which promote effective group processes, decision-making and performance over time (Ensley et al., 2002; Greer, 2012; Mathieu et al., 2015). On the other hand, it has also been argued that strong levels of team cohesion lead to group thinking and conformity processes, which are considered to impede creative processes (Paskevich, Estabrooks, Brawley, & Carron, 2001). Hence, in order to understand how team cohesion may affect team creativity, we propose and test an intermediate mechanism that should reflect the persistence of the team to accomplish the task at hand

considering the energy, and feelings of inspiration and concentration of team members needed to achieve creative goals.

Collective task engagement is defined as a positive, fulfilling, work-related shared motivational state that is characterized by team vigor, team dedication, and team absorption, which emerges from the interaction and shared experiences of members of a workgroup (Costa, Passos, & Bakker, 2014; Salanova, Llorens, Cifre, Martinez, & Schaufeli, 2003). Team vigor refers to the energetic component of task engagement that implies strong levels of energy and mental resilience while working, putting a great deal of effort into a team task and persisting, even when difficulties might occur. Team dedication means the involvement in a team task by experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Team absorption refers to full immersion in the team's work. Team members who feel absorbed in their activities or tasks feel that time passes more quickly and find it hard to detach themselves from their work (Schaufeli, Bakker, & Salanova, 2006).

Collective task engagement should play a key role in the relationship between team cohesion and team performance due to its motivational nature. Our theoretical explanation of the relationship between team cohesion and team creativity is in part inspired by the motivational theories of the Job Demands-Resources model (JD-R model) (Bakker & Demerouti, 2007; Crawford, LePine, & Rich, 2010; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004) and Intrinsic Motivation Theory (Deci & Ryan, 1987; Gagné & Deci, 2005). We are very aware that psychological constructs do not simply translate from an individual level of analysis to a team level of analysis (Chan, 1998). However, we consider the underlying rationale of these models allows us to describe the processes that may be at work at the team-level more easily and will help to conceptually explain the development of team task engagement and its role in team creative performance.

The JD-R model posits that employees' psychological states and consequently their work performance (in our case, team creative performance) are determined by the extent to which individuals have work- and social-related resources (in our case, team cohesion) at their disposal. We believe that collective task engagement as a shared positive aspect of collective well-being in work groups should similarly be influenced by the shared team social resources that team members may draw upon. Team social resources refer to several aspects of team functioning that emerge from interpersonal dynamics between team members and from which teams can benefit in terms of overall performance and behavioral action (Oh, Chung, & Labianca, 2004). As members of teams high in cohesion experience a set of similar positive interpersonal events (e.g., sharing of positive emotions, encouraging all team members toward a common purpose, expressing team pride, continuous reciprocal support in the face of challenges), we believe that over time this will result in a common motivational state characterized by absorption, vigor and dedication oriented toward the team ("We're in this together so let's do it!"). Indeed, team cohesion has been found to increase the connectedness between team members and to facilitate smooth group interaction and open communication (Ensley, Pearson, & Amason, 2002), which in turn should establish stable group structures and the promotion of functional group processes (Hackman, 2012). In the end, these will lead to a heightened team motivational state, collective task engagement, as these positive team exchanges act as a motivating psychological resource where the team can replenish its energy when confronted with adversity or challenging experiences. Evidence for the emergence of common positive psychological states comes from research on mood convergence and emotional contagion in work groups (George,1996; Hatfield, Cacioppo, & Rapson, 1994; Trottedel, Kellett, & Briner, 1998). While research on the development of collective task engagement in teams is relatively new, initial results bring support for our argument that social resources such as group cohesion are instrumental in attaining a shared positive, motivational state (Costa et al., 2014; Salanova et al., 2003).

In turn, we posit that this collective task engagement will be the motivational driver for the team, propelling them toward increased team creative performance. This notion is based on the logic of intrinsic motivation theory (Deci & Ryan, 1987). The intrinsic motivation perspective has been one of the most influential theoretical frameworks guiding employee creativity research (Amabile et al., 1996; Amabile, 1988). This perspective has received ample empirical support for its depiction of the role of intrinsic motivation as a psychological mechanism explaining the influences from the work environment on employees' creativity (Anderson et al., 2014). In this regard, intrinsically motivated people are said to engage in activities for the sake of the task itself, which is perceived as pleasant and interesting (Deci & Ryan, 1987). As they are absorbed and engaged in the task itself, intrinsically motivated individuals are found to be more creative. Adopting the same logic at the team level, collective engagement may be considered as a type of team-level manifestation of intrinsic motivation in the sense that it may increase the tendency of the team to be curious and cognitively flexible, to put in effort, and to be persistent when confronted by barriers, which should result in creative outcomes (Grant & Berry, 2011; Zhou, 1998). Indeed, as new approaches have to be explored in order to find an adequate solution for a specific problem, the shared experience of vigor, absorption and dedication will lead engaged teams to collectively persist in the task, work toward their creativity goals, have feelings of enthusiasm and inspiration, and become cognitively immersed in the task, which in turn will lead to creative outcomes. When engaging in creative tasks, drawbacks or difficulties are likely to be encountered and, thus, the success of creative teams strongly depends on their ability to surmount these obstacles. Persistent team vigor, dedication, and absorption should be crucial characteristics of teams to stay focused on their efforts to cope with obstacles (Zhou, 1998). In addition, as task engagement refers to the experience of a positive state of motivational fulfillment at work, this should facilitate experimenting, trying out new behavioral strategies, and thus stimulate creativity. There is some preliminary evidence supporting the role of collective task engagement as a psychological mechanism affecting team performance. Salanova, Agut and Peiró (2005) demonstrated that work

units' work engagement mediated the relationship between organizational resources and service climate, which in turn influenced collective employee performance and customer loyalty in the service sector. Therefore we propose:

Hypothesis 2: Throughout the course of a creativity task episode, team task engagement positively mediates the relationship between team cohesion and team creative performance.

Thus far, we have proposed an indirect effect of cohesion on team creative performance by integrating collective task engagement as an underlying motivational mechanism throughout the course of a specific creativity task episode. However, social and work-related resources (e.g., cognitive, motivational or behavioral) do not exist in isolation, but are dynamic and evolve as teams engage in various tasks or activities over time (Marks et al., 2001). Previous research has raised some ambiguity regarding the direction of the relationship between social resources (i.e., team cohesion) and team performance. On the one hand, results of several meta-analyses show a positive relationship between team cohesion and performance (e.g., Beal, Cohen, Burke, & McLendon, 2003; Evans & Dion, 1991). On the other hand, it seems these constructs might be reciprocally related to each other (Kozlowski & Ilgen, 2006; Mullen & Copper, 1994). Specifically, Mathieu et al. (2015) found meta-analytical support for the reciprocal influence between cohesion and performance over time in management teams. These authors ran additional longitudinal analyses indicating that, although team cohesion and performance are reciprocally related, the model worked best when cohesion predicts performance over time, and not the other way around. Hence, the dialogue is open, specifically regarding the role of team cohesion and team performance during creativity tasks over time. In fact, there is a lack of empirical evidence on the longitudinal relationship between team performance and cohesion in creative contexts (Mathieu et al., 2015). Research findings are especially scarce on project or temporary teams that have few references of past experiences as a team. Hence, in the absence of common experiences, the perceived immediate success in previous tasks may be one of the main predictors of future team social resources development. In addition, creative tasks are typically characterized by a high degree of uncertainty

(Mueller, Melwani, & Goncalo, 2011), making it difficulty for team members to gauge the future success of their creative task performance. As uncertainty is an aversive state, the impact of team members' being successful in a creative task (and thus avoiding uncertainty) might potentially have a stronger impact on subsequent group cohesion than successful performance in a traditional task.

Accordingly, in the present study we expect to find a reciprocal effect of team creative performance on future team cohesion. It is our contention that collective perceptions of having successfully performed a creative task will influence the development of future team cohesion. Team members perceiving that they performed well as a team in a previous creativity task will gain confidence and will increase the social ties with their team members. This should be beneficial for the social integration of team members and thus enhance the development of future team cohesion, as team members will be more likely to collaborate and help each other during subsequent task episodes. In other words, cohesive teams should be able to use their teams' resources more efficiently because they know their other team members better and are motivated to complete the task successfully (Beal, Cohen, Burke, & McLendon, 2003).

The foregoing reasoning is grounded on different theoretical principles. First, the input-mediator-output-input framework, or IMOI, (Ilgen, Hollenbeck, Johnson, & Jundt, 2005) considers team processes and emergent states as mediating mechanisms between team inputs and team outputs. In this sense, teams go through a series of IMOI iterative episodes over time, where the outputs of one episode may become inputs of subsequent ones. Second, and connected with the previous idea, lies the principle of team regulation. This principle describes team performance as a dynamic and cyclic process where team actions are directed toward the accomplishment of specific goals, and perceptions of progress lead to the revision of subsequent effort investment and the adaption of working strategies in order to resolve the discrepancy between goals and performance (Kozlowski & Ilgen, 2006). In this regard, perceptions of success (i.e., mastery experiences) are said to affect subsequent task performance as they shape the development of resources (Bandura, 1997). Third, and consistently with the Conservation of Resources theory (COR; Hobfoll, 2001), we acknowledge

that in addition to protecting their current resources (i.e., personal, social or environmental), people constantly strive to accumulate and develop new resources resulting in resource caravans (Xanthopoulou et al., 2009). In other words, perceived team past success will act as a resource builder increasing future team social resources (i.e., cohesion).

Hence, we expect teams perceiving high performance during a former creativity task episode to be more likely to further develop their cohesion levels, which will benefit team creative performance during a subsequent task episode.

Hypothesis 3: Perceived team performance in a creativity task positively relates to the development of future team cohesion at a subsequent task episode.

Method

Sample and procedure

The present study adopted a three-wave design, involving 605 Spanish individuals participating in an organizational simulation exercise that consisted of three different team creativity tasks. Participants were recruited through a website built for this purpose and also through advertising posted on panels at the Universitat Jaume I (Castellón, Spain). Each participant received a financial reward (20 €) for taking part in the three tasks. A heterogeneous sample was composed with university students (71.6%) from different degree courses (Psychology, Languages, Economics, Law, Design, Engineering, etc.), full-time workers (16.8%) from a wide range of occupations, and unemployed people (11.6%). Participants were randomly assigned to the final 118 teams, which were similar in size (i.e., four to six members each; $M = 5.13$; $SD = 0.89$) and structure (i.e., similar combinations of students, employed and unemployed people). 35.7% of the participants were men and the average age was 25.3 years. Participants were told that the purpose of this study was to investigate team performance by handling a creativity project.

Each team was brought together during three laboratory sessions, one session per week during three consecutive weeks, to work on a creativity task. All teams were told that the goal of the task was to achieve creative outcomes. Although all three tasks involved a creativity assignment, the specific content of each task varied in order to avoid learning effects (Ziessler & Nattkemper, 2001). At time 1 (T1), teams were instructed that they were a team working for an organization that sold toys. Specifically, during the subsequent three sessions they would have to perform three different creative tasks (i.e., in the sense that their output had to be novel and adequate) during 40 minutes. The first session (T1) comprised an idea generation task, as teams had to come up with a creative slogan that promoted their organization. One week later (T2), teams came together to work on a second creativity task. Teams were instructed to develop a prototype of a "toy" made out of recyclable materials (equal for all teams). One week later (T3), teams performed a final task and had to design a poster to promote their toy. After each task, participants were asked to complete a questionnaire assessing the variables under study.

Measures

We used validated scales, and the reliability information (Cronbach's alpha) of the scales is presented in Table 1.

Team cohesion was assessed by three items adopted from the scale of Price and Mueller (1986) (e.g., *the task has been realized in an amicable and pleasant atmosphere*). Items were answered on a 7-point Likert-type scale (0= never to 6= always).

Collective task engagement was assessed following Salanova et al. (2003) by using three items of each dimension of the short version of the Utrecht Work Engagement Scale (see Schaufeli et al., 2006): Vigor (three items, e.g., *during the realization of the task, my team felt full of energy*), Dedication (three items, e.g., *my team was enthusiastic about the task*), and Absorption (three items, e.g., *time flew when my team was working on the task*). Items were answered on a 7-point Likert-type scale (0= never to 6= always).

To overcome limitations of past research (Tekleab et al., 2009) and answering the need to incorporate objective outcome measures in the creativity domain (Anderson et al., 2014), we measured ***creative team performance*** by means of two different measures: *perceived team performance* and *task output creativity*.

Perceived team performance was assessed by three items from Goodman and Svyantek's (1999) scale (e.g., *in my team, we achieved the goals of the task*). Items were answered on a 7-point Likert-type scale (0= totally disagree to 6= totally agree).

Task output creativity was assessed for each task output based on the creativity assessment procedure of Baer and colleagues (2010). Specifically, three external coders evaluated the team outputs in all the creativity tasks: an expert (i.e., somebody with professional expertise concerning the particular creativity task) and two researchers (not involved in the study), who received creativity assessment training. Creativity was defined in terms of ideas that are both original and useful (Amabile, 1988). During the assessment training, the raters were instructed to individually assess the creativity of three randomly selected team task outputs (0= Not at all creative to 6= Highly creative). After completing their individual evaluations, the raters compared their scores and discussed possible disagreements. In a second step, all three raters were instructed to independently score the creativity of each team task output. This procedure was repeated for each creativity task (i.e., T1: slogan, T2: toy, T3: poster). To construct the creativity score for the task output of each team, creativity ratings were averaged across the three coders. To examine whether aggregation across raters was justified (to obtain an aggregated score for task output creativity), the intraclass correlation coefficient (ICC1 & ICC2; Bliese, 2000) and R_{wg} values (James, Demaree, & Wolf, 1993) were calculated.

In the present study, the average ICC1 value was .37, ranging from .29 (i.e., T2 creativity) to .44 (i.e., T3 creativity). The average ICC2 value was .63, ranging from .55 (i.e., T2 creativity) to .70 (i.e., T3 creativity). The average R_{wg} value was .71, ranging from .64 (i.e., T1 creativity) to .80 (i.e.,

T3 creativity). Taken together, all measures were acceptable, suggesting adequate levels of agreement, thereby justifying aggregation across the three raters (Bliese, 2000; LeBreton & Senter, 2007).

It should be noted that we do not hypothesize a cross-lagged association between the independently rated creativity scores and subsequent team social resources because task output creativity was assessed after having completed all three creativity tasks. Consequently, teams were not aware of their externally rated creativity scores during the simulation exercise and therefore they could not have had an impact on their team cohesion in subsequent creativity task episodes.

Data analyses

We computed the means, standard deviations, Cronbach's alpha coefficients and bivariate correlations for all scales. First, as a preliminary step, we tested the measurement model. A series of confirmatory factor analyses (CFA) were conducted to differentiate the constructs of team cohesion, collective task engagement and perceived team performance. Following the procedure of Price, Choi and Vinokur (2002), in each time period (T1, T2, T3) we used the same set of indicators to specify the corresponding latent variables in this measurement model. Furthermore, we calculated: (a) covariances between the measurement errors of the respective indicators across the three time periods, (b) constraints setting the factor loadings as being equal across the three time periods, and (c) covariances between each latent variable and every other latent variable in the model.

Second, in order to statistically justify the aggregation of the team members' survey responses to the team level (i.e., team cohesion, collective task engagement and perceived team performance), we calculated intraclass correlation coefficients (i.e., ICC1 and ICC2) and also within-group interrater agreement (i.e., R_{wg}; James, Demaree, & Wolf, 1993).

Finally, Structural Equation Modeling (SEM) (using AMOS 19) was employed to test our hypothesized research models. Moreover, following Price et al. (2002), we also tested an alternative theoretical model regarding the reciprocal role of team cohesion and performance. First, the

Stability Model (M1) was tested without cross-lagged structural paths, but with temporal stabilities and synchronous correlations (i.e., including paths going from team cohesion to collective task engagement, from collective task engagement to perceived team performance, and from collective task engagement to task output creativity). Temporal stabilities were specified as correlations between the corresponding constructs at T1, T2 and T3. Second, we tested Hypothesis 1 (M2), which included direct paths between T1 team cohesion to T2 perceived team performance and T2 task output creativity, as well as T2 team cohesion to T3 perceived team performance and T3 task output creativity. In other words, this model was tested without including team engagement as a mediator. Third, we tested Hypothesis 2 (M3), regarding the mediating role of team engagement between team cohesion and team performance. Finally, we tested the complete hypothesized model regarding Hypothesis 3 (M4; see Figure 1), which includes reciprocal relationships among team cohesion and perceived team performance at the three waves, namely a cross-lagged structural path going from T1 perceived team performance to T2 team cohesion, as well as a path going from T2 perceived team performance to T3 team cohesion.

Insert Figure 1 here

We also tested a theoretically alternative model (M5, Figure 2). Therefore, in line with Mathieu et al. (2015) we included cross-lagged paths between team cohesion and performance over time, so that team cohesion was related to future perceived team cohesion and also output creativity.

Model fit. Maximum likelihood estimation methods were used in order to test the different models. The goodness-of-fit of the models was evaluated, using absolute and relative indices. The absolute goodness-of-fit indices calculated were: the χ^2 Goodness-of-Fit Statistic, the relative χ^2 test, Goodness-of -Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), and the Root Mean Square Error of Approximation (RMSEA). Moreover, the computation of relative goodness-of-fit indices is

strongly recommended (Bentler, 1990). Following Marsh, Balla and Hau (1996), three such fit indices were computed: (1) the Comparative Fit Index (CFI); (2) the Incremental Fit Index (IFI); and (3) the Non-Normed Fit Index, or Tucker-Lewis Index (TLI). Finally, we computed the Akaike Information Criterion index (AIC; Akaike, 1987) and the Expected Cross-Validation Index (ECVI).

Split-sample test. The hypothesized model H3 (M4) was re-tested using a split-sample approach to reduce problems related to common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In line with Ostroff, Kinicki and Clark (2002) and Chun, Shin and Kim (2013), we split each team into two subgroups with a minimum of two members in each. Participants in subgroup A provided data on team cohesion and team perceived performance, and participants in subgroup B provided data on collective task engagement.

Results

Descriptives and aggregation analysis

Table 1 presents the means, standard deviations, internal consistencies (Cronbach's alpha) and bivariate correlations of all the variables in the study. All Cronbach's alpha coefficients meet the criterion value of .70 (i.e., they ranged from .83 to .93).

Insert Table 1 here

Across all the survey variables in the present study, the average ICC1 value was .22, ranging from .11 (i.e., T1 perceived team performance) to .31 (i.e., T2 perceived team performance). The average ICC2 value was .58, ranging from .39 (i.e., T1 perceived team performance) to .70 (i.e., T2 perceived team performance), and the average R_{wg} value was .86, ranging from .85 (i.e., T1 collective task engagement) to .91 (i.e., T1 team cohesion). Although ICC1 and R_{wg} values are in line with past research concerning data aggregation (e.g., James et al., 1993), the ICC2 values are quite low. However, Bliese (1998) stated that ICC2 values are a function of ICC1 values and group size. Due to the relatively modest group size in the present study (i.e., only four to six members per group), ICC2 indices were somewhat lower in magnitude. Bliese argues that such lower reliability

scores might weaken the relationships that are observed at the group level. Hence, given the satisfactory ICC1 and R_{wg} values and taking the less than optimal ICC2 values into account, we proceeded to aggregate the survey variables of the present study.

Measurement model

The estimated measurement model showed a good fit to the data: $\chi 2$ (918, N= 605) = 3074,316, p < .000; NFI = .87, NNFI = .89, CFI = .90, and RMSEA = .062. Therefore, we used it to calculate the following structural models.

Testing the hypothesized structural models

Table 2 shows the overall fit indices of the models in our study. Structural path coefficients of the Hypothesized Model and alternative model (final model) (M5) are presented in Figure 2.

Insert Table 2 and Figure 2 here

First, M2 structural relationships reveal a positive relationship between team cohesion and team performance, only for perceived team performance (T1 β = .60, p < .001; T2 β = .58, p < .001; T3 β = .56, p < .001). The relationship between team cohesion and output creativity was not significant at T1 (T1 β = .12, n.s), and significant at T2 (β = .18, p < .05) and T3 (β = .20, p < .05). Thus, Hypothesis 1 was only partially supported.

Second, the hypothesized model regarding Hypothesis 2 (M3) shows that team cohesion is positively related with team performance (both output creativity and perceived task performance) through team task engagement at all three waves. More specifically, T1 team cohesion is positively related to T1 collective task engagement (β = .70, p < .001), which in turn leads to T1 perceived performance (β = .72, p < .001), but not to T1 output creativity (β = .09, n.s). T2 team cohesion is positively related to T2 collective task engagement (β = .71, p < .001), which is positively related to T2 perceived performance (β = .75, p < .001) and T2 output creativity (β = .33, p < .001). Finally T3 team cohesion is positively related to T3 collective task engagement (β = .67, p < .001), which

in turn is positively related to T3 perceived performance (β = .70, p < .001) and T3 output creativity (β = .26, p < .01). Thus, Hypothesis 2 was supported.

Partial support was provided for Hypothesis 3 (M4), as we found a positive relationship between performance and future team cohesion. However, significant relationships were only found for perceived team performance from T1 to T2 cohesion (β = .24, p < .05) and from T2 perceived performance to T3 team cohesion (β = .20, p < .05), but not for the output creativity measure T1 to T2 (β = .07, *n.s*) and T2 to T3 (β = .02, *n.s.*).

Furthermore, an alternative model was tested including the direct paths from team cohesion to future team performance (both output creativity and perceived performance). Results showed that no significant direct relationships were found for team cohesion to future performance over time, with the exception of T2 team cohesion to T3 output creativity (β = .27, p < .05). Finally, in order to verify the robustness of our findings, we re-tested the hypothesized model (M4) by adopting a split-sample approach. More specifically, we relied on survey data from two different sources: subgroup A for team cohesion and perceived team performance, and subgroup B for collective task engagement. This split-sample test of the Hypothesized model provided satisfactory fit indices: "$\chi 2$ (122) = 207.69, p < .001, IFI =.93, TLI = .91, CFI = .93, RMSEA = .08, AIC = 305.69, ECVI = 2.75". The structural relationships of this model were in line with the results of the hypothesized model test using the entire sample. The only difference that could be observed when adopting a split-sample approach is the cross-lagged relationship between T2 perceived task performance and T3 team cohesion. Contrary to what we found when using the entire sample, in this case the second cross-lagged relationship was not significant (β = .15, n.s.).

Discussion

In the present study, we sought to uncover the role of team engagement as an explanatory mechanism in the team cohesion–team creativity performance relationship. In addition, we aimed to model the dynamics of team cohesion development, team engagement and team creativity

performance over time. In doing so, we answered recent calls regarding the need to understand the longitudinal functioning of team creativity (i.e., Anderson et al., 2014; Shin & Zhou, 2007).

Generally, our hypotheses were supported, as our findings indicate that team cohesion leads to performance, but only for perceived team performance (partially supporting H1). Cohesive teams were more likely to perform well (in our case both types of performance: output creativity and perceived performance) on creativity tasks through the teams' increased engagement with the task at hand (supporting H2). Moreover, we also found a cross-lagged reciprocal relationship between perceived team performance and team cohesion. Specifically, teams with better performance perceptions on a creativity task reported stronger team cohesion in subsequent task episodes (supporting H3). In sum, these results provide supporting evidence for the central role of engagement in team motivational processes.

Theoretical implications

The present study extends existing theory on team cohesion, team engagement and team creativity in a number of ways. First, we address the ambiguous relationship between team cohesion and team creative performance existing in the literature (Hülsheger, et al., 2009; Joo et al., 2012; Taggar, 2002). In this sense, we have shown that team engagement plays a relevant role in the link between team cohesion and team creative performance. This finding reinforces the idea that affective motivational states (in our case team engagement) act as a hinge between team resources (i.e., team cohesion) and performance (i.e., team creative performance). This also tentatively suggests that motivational mechanisms, such as intrinsic motivation (Deci & Ryan, 1987), which have been found to be conducive to individual creativity may also be at play on a team level. Moreover, the present study further develops extant knowledge of engagement and creativity at the collective level, by providing empirical evidence on the mediating role of engagement in the team creative process. In doing so, we have addressed recent calls for additional empirical studies

accounting for team level antecedents and the consequences of team engagement (Costa et al., 2014).

Second, our findings regarding how team creativity is fostered over time also address the call for additional research on longitudinal team creativity and innovation (Anderson et al., 2014). By adopting a three-wave design, we further extend current theory on the dynamic development of team social resources over a series of creativity task experiences. Specifically, across three subsequent task episodes, we observed cross-lagged effects of positive perceptions of team creative performance on future team resource development (team cohesion) and hence found that reciprocal gains arose between team cohesion and perceived team creative performance. This finding is also in line with the IMOI framework (Ilgen et al., 2005).

Third, our findings are also informative research on team cohesion and performance (Beal et al., 2003). The mediating role of engagement in explaining the link between cohesion and creative performance adds new insights to the growing research on teams' creativity dynamics. In line with Mathieu et al.'s (2015) results, we found support for the relationship between team performance and team cohesion. However, these authors found stronger support for the effect of team cohesion on team performance over time than vice versa. Our study suggests that, at least in creative tasks in temporary project teams, perceived past performance is a stronger predictor (consistently over time) of subsequent team cohesion, rather than the other way around. However, additional analyses revealed that T2 team cohesion strongly predicted T3 output creativity. This suggests that team cohesion may account for subsequent objectively measured creative team performance, while team perceptions of past performance enhance future team cohesion. Thus, how performance is measured might be an important issue to consider in the team cohesion-performance relationship.

A strength of our study relative to previous team cohesion and performance outcomes research is therefore the way performance was measured (Beal et al., 2003). In our study, apart from team members' perceptions of the team's performance in each creativity task, we also incorporated

independently rated creativity scores of the team's task output. In doing so, we addressed an existing concern in research on creativity, which has mainly relied on self-reports of both predictor and outcome variables and which is a limitation of past research (Tekleab et al., 2009). Hülsheger and colleagues (2009) demonstrated that if respondents rate both team-level processes and their own performance, this might lead to overestimated effect sizes. Although it may usually be recommended to rely exclusively on independent performance ratings because of the likelihood of method bias (e.g., Gully, Incalcaterra, Joshi, & Beaubien, 2002), these different rating sources were theoretically relevant for our research model. We found that shared perceptions of team performance on a creativity task fuel the development of subsequent team social resources, instead of the independently rated task output creativity. Independently rated task output creativity was obtained only after the sessions had finished, so teams did not receive any kind of feedback about their objective performance during their participation in the study. Furthermore, both types of team performance were positively related to collective task engagement. However, contrary to what was expected, collective task engagement was not related to output creativity at T1. An explanation for this non-significant relationship could be that collective task engagement did not immediately lead to actual creative output (i.e., rated by the external coders) as it was the first time that team members had to work together on a creativity task. This may have affected only their perceptions of creative performance, as "new" teams that are involved in a creative activity experiencing collective task engagement for the first time may perceive high performance; however, this does not necessarily result in immediate creative output. Although substantial evidence has been found regarding the benefits that engagement may have for organizations (see Harter, Schmidt, & Hayes, 2002, for a meta-analysis), and the link between work engagement and task performance has been empirically validated (Christian, Garza, & Slaughter, 2011), these studies are mostly based on the individual level. Therefore, research is needed to provide further empirical evidence to better understand how the relationship between team engagement and team performance takes shape over time, especially in newly formed teams. For instance, questions regarding how much time or

interaction is needed for the team to reach an acceptable level of performance still remain unsolved (Balkundi & Harrison, 2006).

Finally, our study also informs the debate among team researchers (e.g., Costa et al., 2014; Kozlowski & Chao, 2012; Morgeson & Hofman, 1999) regarding how team emergent constructs should be operationalized. Some studies have targeted the collective constructs as the sum or average of individual ratings. In our case, we measured all the constructs with the team as the focal referent and using the first-person plural (e.g., 'in my team, we achieved the goals of the tasks') as suggested by Costa et al. (2014).

Practical implications

Our results may be particularly interesting for organizations aiming to foster team and organizational creativity. Our findings suggest that team creativity benefits from team cohesion through its effect on collective task engagement. Hence, team-level interventions to stimulate team creativity may focus on the enhancement of team cohesion and team engagement (Schaufeli & Bakker, 2004). Promoting team-oriented policies and highlighting team social resources will be the most efficient management behavior when team creative outcomes are required in an organization. In fact, as our results show, such interventions may also induce reciprocal gains between team cohesion and creative performance. Furthermore, organizations may consider working with self-managed teams and build interdependence into job design as they require greater collaborative interaction, which leads to greater team cohesion (Seers, Petty, & Cashman, 1995).

Our results also indicate that teams that perceive themselves as having performed well on a creativity task are more likely to develop team cohesion over time. This implies that tasks could be strategically composed and adapted to trigger and reinforce these reciprocal dynamics. Teams charged with creative activities could start to work on a relative simple creativity task, which makes successful performance more likely, thereby boosting social resources. As team social resources

grow and take shape across subsequent task cycles, teams could then gradually move on to more complex creativity assignments.

Limitations and future avenues for research

Due to the relative complexity of our design, this study is not without its limitations. First, we did not hypothesize a cross-lagged association between the independently rated creativity scores and subsequent team cohesion because objective task output creativity was assessed after having completed all three creativity tasks. Consequently, teams were not aware of their externally rated creativity scores during the simulation exercise and they could therefore not have had an impact on their team cohesion in subsequent creativity task episodes. Hence, a question arises regarding whether having real feedback from each task will influence future team cohesion levels. Although developmental feedback is positively related to team creativity (Joo et al., 2012), further research should address the role of feedback on team cohesion and team engagement over time.

Second, we focused on team engagement and how it affects the relationship between team cohesion and creativity during specific task episodes. In this way, we aimed to establish a better understanding of team-level antecedents of collective task engagement and team creativity. However, there are other possible and relevant antecedents related to social resources in teams such as collective efficacy. Collective efficacy influences what team members choose to do as a team, the amount of effort they exert, and their perseverance in the face of challenges or failure to produce results (Bandura, 2000). In our study we did not include this antecedent due to design limitations, but further research should include it in order to know its role in creativity over time.

Future research may also introduce moderators to further explore the development of team cohesion over time. For example, environmental factors (e.g., creativity support) or leadership styles (Zaccaro, Rittman & Marks, 2001) (e.g., directive vs. participative) may moderate the effects of creative performance on team cohesion and vice versa.

Further, we used three different creativity tasks to avoid learning effects among participants. Although all three tasks concerned a creative activity, team output differed across them, which may have had implications on how the team output was evaluated across the tasks. However, given the fact that we found similar effects across the three tasks, the study attests to the robustness of our hypothesized model. Beyond analyzing only the creative process, future research could test whether the causal chain team cohesion–team engagement–team performance also holds in the implementation stage, thereby covering the entire innovation process and complementing recent research on innovation (Somech & Drach-Zahavy, 2013).

Finally, the present study relied on an organizational simulation exercise conducted in a controlled setting, which yields some benefits but also pitfalls. Our study allowed us to compose relatively similar teams, and enabled independent raters to assess the creativity level of each team output. Although we tried to develop a realistic simulation task, the measures were obtained from lab teams mostly consisting of students without previous working experience. In addition to this, the teams did not have any informal contact between the sessions, since they did not have any link beyond the laboratory study, which may limit the generalizability to field teams. While we are convinced of the relevance of our findings for newly formed project-based teams in organizations, future research might evidently benefit from conducting longitudinal studies on consolidated teams in the field to ensure the external validity of our findings.

Conclusion

What makes creative teams successful in the long run? While the relationship between team social processes and team creativity is complicated, the present study advances collective task engagement as one of the key motivational processes underlying team performance in creative tasks. Through increased collective task engagement, highly cohesive teams may increase their performance in creative tasks, which in turn may lead to higher cohesion. Thus, organizations that

are looking to spur creative performance cycles in teams may want to focus on team social resources such as team cohesion and collective task engagement.

References

Akaike, H. (1987). Factor analysis and AIC. *Psychometrika, 52*, 317–332.

Amabile, T. M. (1988). A model of creativity and innovation in organizations. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (pp. 187–209). Greenwich: CT: JAI Press.

Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity.* Boulder, Co: Westview.

Amabile, T. M., Conti, R., Coon, H., Laznby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39*, 1154–1184.

Anderson, N., Potocnik, K. & Zhou, J. (2014). Innovation and Creativity in Organizations: A State-of-the-Science Review and Prospective Commentary. *Journal of Management, 40*, 5, pp. 1297-1333.

Baer, M., & Oldham, G. R. (2006). The curvilinear relation between experienced creative time pressure and creativity: moderating effects of openness to experience and support for creativity. *Journal of Applied Psychology, 91*, 963–970.

Baer, M., Leenders, R. T. A. J., Oldham, G. R., & Vadera, A. K. (2010). Win or lose the battle for creativity: The power and perils of intergroup competition. *Academy of Management Journal, 53*, 827–845.

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-resources model: State of the art. *Journal of Managerial Psychology, 22*, 309–328.

Bakker, A. B., & Xanthopoulou, D. (2013). Creativity and charisma among female leaders: the role of resources and work engagement. *The International Journal of Human Resource Management, 24*, 2760–2779.

Balkundi, P., & Harrison, D. A. 2006. Ties, leaders, and time in teams: Strong inference about network structure's effects on team viability and performance. *Academy of Management Journal, 49*, 49-68.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Bandura, A. (2000) Exercise of human agency through collective efficacy. *Current Directions in Psychological Science, 9*, 75-78.

Beal, D. J., Cohen, R. R., Burke, M. J., & McLendon, C. L. (2003). Cohesion and performance in groups: a meta-analytic clarification of construct relations. *Journal of applied psychology, 88*, 989-.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238–246.

Bliese, P. D. (1998). Group size, ICC values, and group-level correlations: A simulation. *Organizational Research Methods, 1*, 355–373.

Bliese, P. D. (1998). Group size, ICC values, and group-level correlations: A simulation. *Organizational Research Methods, 1*, 355–373.

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations* (pp. 349–381). San Francisco: Jossey-Bas.

Caprara, G. V., Pastorelli, C., Regalia, C., Scabini, S., & Bandura, A. (2005). Impact of adolescents ' filial self-efficacy on quality of family functioning and satisfaction. *Journal of Research on Adolescence*, *15*, 71–97.

Catmull, E. (2008) How Pixar Fosters Collective Creativity. *Harvard Business Review*, September, pp. 65-72.

Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology, 83*, 234-246.

Choi, J. N., Sung, S. Y., Lee, K., Cho, D.-S. (2011). Balancing cognition and emotion: Innovation implementation as a function of cognitive appraisal and emotional reactions toward the innovation. *Journal of Organizational Behavior*, *32*, 107-124.

Christian, M. S., Garza, A. S, & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Personnel Psychology, 64*, 89-136.

Chun, J. S., Shin, Y., Choi, J. N., & Kim, M. S. (2013). How does corporate ethics contribute to firm financial performance? The role of collective organizational commitment and organizational citizenship behavior. Journal of Management, 39, 853-877.

Costa, P.L., Passos, A.M., & Bakker, A.B. (2014). Team work engagement: A model of emergence. *Journal of Organizational and Occupational Psychology, 87*, 414–436.

Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of Applied Psychology, 95*, 834–848.

Daniels, K., Glover, J., Beesley, N., Wimalasiri, V., Cohen, L., Cheyne, A., & Hislop, D. (2013). Utilizing job resources: Qualitative evidence of the roles of job control and social support in problem solving. *Work & Stress*, *27*, 200–221.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The Job demands-resources model of burnout. *Journal of Applied Psychology*, *86*, 499–512.

Eisenbeiss, S. A., Van Knippenberg, D., & Boerner, S. (2008). Transformational leadership and team innovation: integrating team climate principles. *Journal of Applied Psychology*, *93*, 1438–1446.

Ensley, M. D., Pearson, A. W., & Amason, A. C. (2002). Understanding the dynamics of new venture top management teams: cohesion, conflict, and new venture performance. *Journal of Business Venturing*, *17*(4), 365-386.

Evans, C. R., & Dion, K. L. (1991). Group cohesion and performance a meta-analysis. *Small group research*, *22*(2), 175-186.

George, J. M. (1990). Personality, affect, and behavior in groups. *Journal of Applied Psychology*, *75*, 107–116.

Gersick, C. J. G. (1988). Time and transition in work teams: Toward a new model of group development. *Academy of Management Journal, 31*, 9–41.

Glick, W. H. (1985). Conceptualizing and measuring organizational and psychological climate: Pitfalls in multilevel research. *Academy of Management Journal*, *10*, 601–616.

Goodman, S. A., & Svyantek, D. J. (1999). Person-organization fit and contextual performance: Do shared values matter. *Journal of Vocational Behavior*, *55*, 254–275.

Greer, L. L. (2012). Group cohesion: then and now. *Small Group Research, 43*(6), 655-661.

Gully, S. M., Incalcaterra, K. A., Joshi, A., & Beaubien, J. M. (2002). A meta-analysis of team-efficacy, potency, and performance: Interdependence and level of analysis as moderators of observed relationships. *Journal of Applied Psychology, 87*, 819–832.

Hackman, J. R. (2012). From causes to conditions in group research. *Journal of Organizational Behavior*, *33*(3), 428-444.

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology, 87*, 268-279.

Hirschfeld, R. R., & Bernerth, J. B. (2008). Mental efficacy and physical efficacy at the team level:Inputs and outcomes among newly formed action teams. *Journal of Applied Psychology, 93*, 1429-1437.

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: advancing conservation of resources theory. *Applied Psychology: An international review, 50*, 337–421.

Hu, L., & Randel, A. E. (2014). Knowledge sharing in teams: Social capital, extrinsic incentives, and team innovation. *Group & Organization Management, 39*, 2, pp. 213-243.

Hülsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. *Journal of Applied Psychology, 94*, 1128–1145.

Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From input-process-output models to IMOI models. *Annual Review of Psychology, 56*, 517-543.

James, L. R., Demaree, R. G., & Wolf, G. (1993). R_{wg}: An Assessment of within-group interrater agreement. *Journal of Applied Psychology, 78*, 306–309.

Jia, L., Shaw, J. D., Tsui, A. S., & Park, T.-Y. (2014). A social-structural perspective on employee–organization relationships and team creativity. *Academy of Management Journal, 57,* 869–891.

Joo, B. K. B., Song, J. H., Lim, D. H., & Yoon, S. W. (2012). Team creativity: the effects of perceived learning culture, developmental feedback and team cohesion. *International Journal of Training and Development, 16,* 77-91.

Karren, R.J. & Barringer, M.W. (2002). A Review and Analysis of the Policy-Capturing Methodology in Organizational Research: Guidelines for Research and Practice. *Organizational Research Methods, 5,* 337-361.

Kozlowski, S. W. J., & Chao, G. (2012). The dynamics of emergence: Cognition and cohesion in work teams. *Managerial and Decision Economics, 33,* 335–354.

Kozlowski, S.W.J., & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest, 7,* 77–124.

LeBreton, J. M., & Senter, J. L. (2007). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods, 11,* 815–852.

Macey, W.H., & Schneider, B. (2008). The meaning of employee engagement. *Industrial and Organizational Psychology, 1,* 3-30.

Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework and taxonomy of team processes. *Adacemy of Management Review, 26,* 356–376.

Marsh, H. W., Balla, J. R., & Hau, K. T. (1996). An evaluation of incremental fit indices: A clarification of mathematical and empirical processes. In G. A. Marcoulides & R. E. Schumacker (Eds.), *Advanced structural equation modeling techniques* (pp. 315–353). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Mathieu, J. E., & Button, S. B. 1992. An examination of the relative impact of normative information and selfefficacy on personal goals and performance over time. *Journal of Applied Social Psychology, 22*, 1758-1775.

Mathieu, J. E., Kukenberger, M. R., D'Innocenzo, L., & Reilly, G. (2015). Modeling reciprocal team cohesion-performance relationships, as impacted by shared leadership and members' competence. *The Journal of applied psychology, 100*, 713-734.

Morgeson, F. P., & Hofmann, D. A. (1999). The structure and function of collective constructs: Implications for multilevel research and theory development. *Academy of Management Review, 24*, 249-265.

Mueller, J., Melwani, S. & Goncalo, J. (2012). The bias against creativity: Why people desire but reject creative ideas. , Psychological Science. 23(1):13-17.

Mullen, B., & Copper, C. (1994). The relation between group cohesiveness and performance: an integration. *Psychological Bulletin, 115*, 210–227.

Nakata, Ch., & Im, S. (2010). Spurring Cross-Functional Integration for Higher New Product Performance: A Group Effectiveness Perspective. J*ournal of Product Innovation Management,27*, 554-571.

Nijstad, B. A., & De Dreu, C. K. W. (2012). Motivated information processing in organizational teams: Progress, puzzles, and prospects. Research in Organizational Behavior, 32, 87–111.

Oh, H., Chung, M.-H., & Labianca, G. (2004). Group social capital and group effectiveness: The role of informal socializing ties. *Academy of Management Journal, 47*, 860–875.

Ostroff, C., Kinicki, A.J. & Clark, M.A. (2002). Substantive and operational issues of response bias across levels of analysis: An example of climate-satisfaction relationships. Journal of Applied Psychology, 355-368.

Paskevich, D., Estabrooks, P., Brawley, L., & Carron, A. (2001). Group cohesion in sport and exercise. In R. Singer, H. Hausenblas, & C. Janelle (eds.), *Handbook of sport psychology* (2nd ed., pp. 472-494). New York: John Wiley

Podsakoff, P.M., MacKenzie, S.M., Lee, J., & Podsakoff, N.P. (2003). Common method variance in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879-903.

Price, J. L., & Mueller, C. W. (1986). *Handbook of Organizational Measurement*. Pitman: Marshfield, MA.

Salanova, M., & Schaufeli, W. (2008). A cross-national study of work engagement as a mediator between job resources and proactive behaviour. *The International Journal of Human Resource Management, 19*, 116–131.

Salanova, M., Agut, S., & Peiró, J. M. (2005). Linking organizational resources and work engagement to employee performance and customer loyalty: The mediation of service climate. *Journal of Applied Psychology*, *90*, 1217–1227.

Salanova, M., Llorens, S., Cifre, E., Martínez, I. M., & Schaufeli, W. B. (2003). Perceived collective efficacy, subjective well-being and task performance among electronic work groups: An experimental study. *Small Group Research*, *34*, 43–73.

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *Journal of Organizational Behavior*, *25*, 293–315.

Schaufeli, W., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement, 66*, 701–716.

Seers, A., Petty, M. M., & Cashman, J. F. (1995). Team-member exchange under team and traditional management- a naturally-occurring quasi experiment. *Group & Organization Management, 20*, 18–38.

Shalley, C. E. (1991). Effects of productivity goals, creativity goals, and personal discretion on individual creativity. *Journal of Applied Psychology, 76*, 179–185.

Shin, S. J., & Zhou, J. (2007). When is educational specialization heterogeneity related to creativity in research and development teams? Transformational leadership as a moderator. *Journal of Applied Psychology, 92*, 1709–1721.

Somech, A., & Drach-Zahavy, A. (2013). Translating team creativity to innovation implementation: the role of team composition and climate for innovation. J*ournal of Management, 39*, 684-708.

Sung, S. Y., & Choi, J. N. (2012). Effects of team knowledge management on the creativity and financial performance of organizational teams. *Organizational Behavior and Human Decision Processes, 118*, 4-13.

Taggar, S. (2002). Individual creativity and group ability to utilize individual creative resources: A multilevel model. *Academy of Management Journal, 45*, 315–330.

Tekleab, A. G., Quigley, N. R., & Tesluk, P. E. (2009). A longitudinal study of team conflict, conflict management, cohesion, and team effectiveness. *Group & Organization Management, 34*, 170-205.

Van Emmerik, I. H., & Brenninkmeijer, V. (2009). Deep-level similarity and group social capital: Associations with team functioning. *Small Group Research*, *40*, 650–669.

West, M. A., & Farr, J. L. (1990). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work* (pp. 3–13). Chichester: Wiley.

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. (2009). Work engagement and financial returns: A diary study on the role of job and personal resources. *Journal of Occupational and Organizational Psychology*, *82*, 183–200.

Zaccaro, S.J., Rittman, A.L., & Marks, M.A. (2001). Team leadership. *The Leadership Quarterly*, *12*, 451-483.

Zhou, J. (1998). Feedback valence, feedback style, task autonomy, and achievement orientation: Interactive effects on creative performance. *Journal of Applied Psychology*, *83*, 261–276.

Ziessler, M., & Nattkemper, D. (2001). Learning of event sequences is based on response-effect learning: further evidence from a serial reaction task. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *27*, 595–613.

Table 1

Descriptive statistics, correlation coefficients and Cronbach's α

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. Team Cohesion T1	5.54	0.34	(.83)										
2. Team Cohesion T2	5.45	0.53	.38**	(.90)									
3. Team Cohesion T3	5.34	0.54	.33**	.58**	(.92)								
4. Collective Task Engagement T1	5.00	0.48	.61**	.34**	.27**	(.91)							
5. Collective Task Engagement T2	5.24	0.50	.43**	.75**	.48**	.56**	(.93)						
6. Collective Task Engagement T3	5.10	0.56	.32**	.46**	.73**	.43**	.57**	(.87)					
7. Perceived Team Performance T1	5.22	0.39	.55**	.38**	.41**	.67**	.49**	.43**	(.88)				
8. Perceived Team Performance T2	5.02	0.60	.34**	.68**	.47**	.48**	.78**	.58**	.59**	(.90)			
9. Perceived Team Performance T3	5.04	0.58	.41**	.59**	.75**	.42**	. 67**	.86**	.57**	.72**	N.A.		
10. Task Output Creativity T1	3.11	1.08	.11	.12	.11	.10	.12	.09	.07	.13	.12	N.A.	
11. Task Output Creativity T2	2.98	0.84	.13	.15	.09	.25**	. 33**	.23*	.09	.22*	.18*	-.03	N.A.
12. Task Output Creativity T3	3.27	1.08	.08	.31**	.18†	.10	. 47**	.25**	.10	.31**	.27**	.06	.14

Note. $N = 118$. Internal correlations are presented at the team level. Internal consistency values (Cronbach's α coefficients) appear across the diagonal in parentheses. N.A. = not applicable. T1 = Creativity task 1, T2 = Creativity task 2, T3 = Creativity task 3.

† $p < .10$; * $p < .05$; ** $p < .01$.

Table 2

Fit of the alternative research models (N=118)

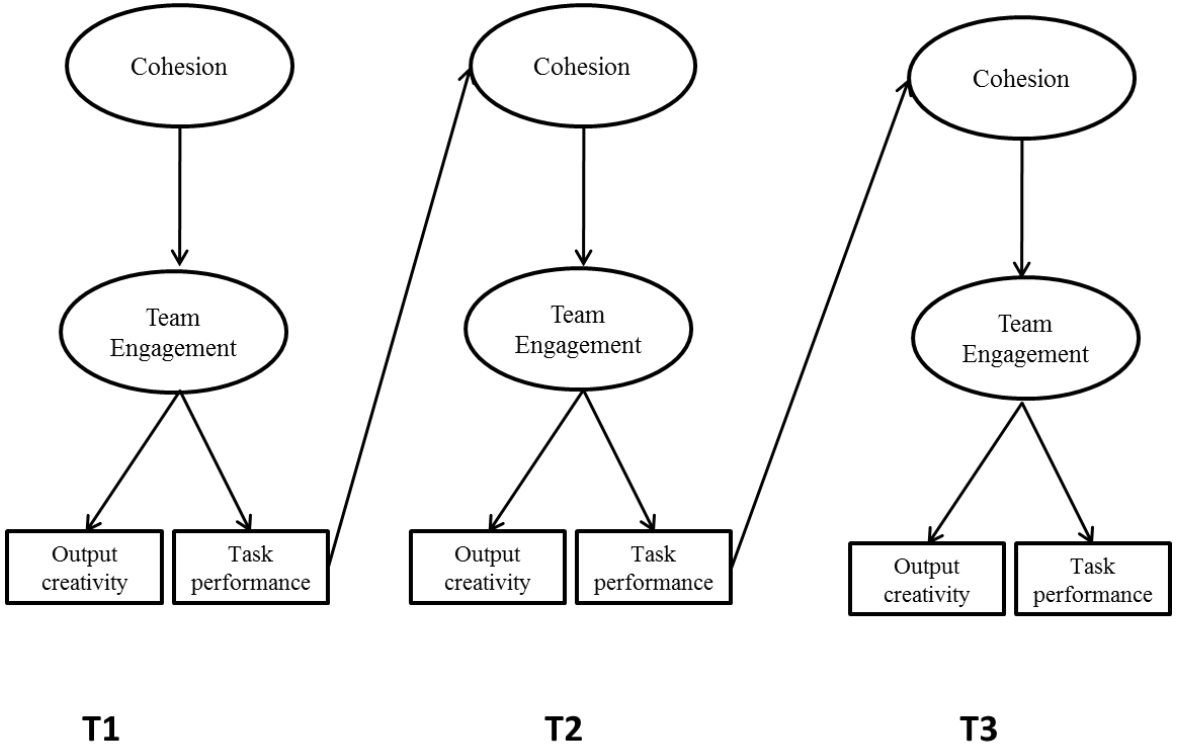
Models	χ^2	*df*	χ^2/ *df*	GFI	AGFI	RMSEA	CFI	IFI	TLI	AIC	ECVI
M1. Stability	458.89	241	1.90	.76	.70	.09	.93	.93	.91	576.89	4.93
M2. Hypothesis 1	163.17	86	1.90	.85	.79	.09	.94	.95	.93	231.17	1.98
M3. Hypothesis 2	373.65	235	1.59	.80	.75	.07	.95	.95	.94	503.65	4.31
M4. Hypothesis 3	364.73	231	1.58	.80	.75	.07	.95	.96	.95	502.73	4.30
M5. Alternative model (Final model)	355.82	227	1.57	.81	.75	.07	.96	.96	.95	501.82	4.29

Note. $\chi 2$ = Chi-square; *df* = degrees of freedom; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index;

RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; IFI = Incremental Fit Index;

TLI = Tucker-Lewis Index; AIC= Akaike Information Criterion; ECVI= Expected Cross-Validation Index.

Figure 1. Hypothesized model (M4) T1 = Creativity task 1, T2 = Creativity task 2, T3 = Creativity task 3.



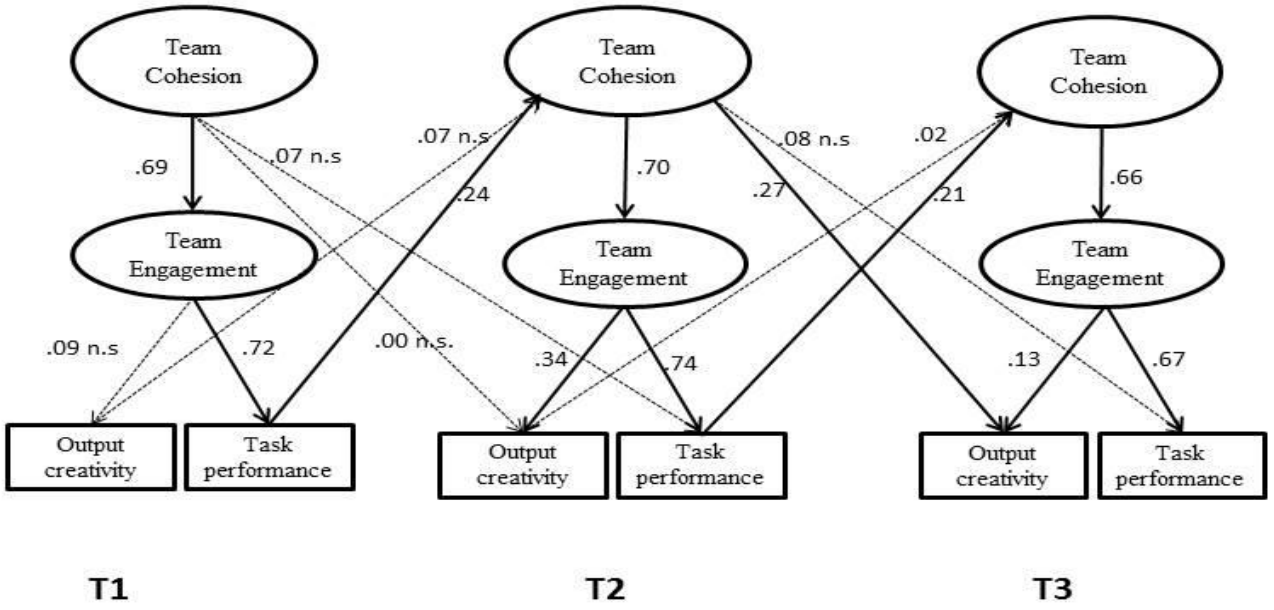


Figure 2. Structural path coefficients of the alternative final model (M5). The model controls for the temporal stability between all measures. T1 = Creativity task 1, T2 = Creativity task 2, T3 = Creativity task 3.

Response Letter to Reviewer's Comments (second round) (GOM-1826)

Dr. Jin Nam Choi
Associate Editor, Group & Organization Management
jnchoi@snu.kr

Dear Dr. Choi:

Thank you very much for your letter of 26th August again offering us the opportunity to submit a revised version of our manuscript: "What Makes Creative Teams Tick? Cohesion, Engagement and Performance across Creativity Tasks: A three-wave study" to *Group & Organization Management*.

Below we explain how we addressed the concerns and comments of the reviewer and your own comments. We very much appreciate the time and continued effort you put into our paper and your thoughtful comments. We hope that the changes we have introduced in this new version of our manuscript now make it suitable to be considered for publication in *Group & Organization Management.*

Best regards,

Alma M. Rodríguez-Sánchez

26-Aug-2015
Dear Miss Rodríguez-Sánchez:

Manuscript ID GOM-1826.R1 entitled "What Makes Creative Teams Tick? Resources, Engagement and Performance across Creativity Tasks: A three wave study" which you submitted as a revision to Group & Organization Management, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter. Thank you for submitting your revision for further publication consideration at Group & Organization Management (GOM). I have received a review of this manuscript completed by a scholar who also provided his/her review for the initial submission.

However, I have experienced some difficulty with another reviewer, and I am still waiting for his/her review. However, instead of further delaying the review process, I decided to make my editorial recommendation for this revision based on an available review.

As you will see, Reviewer 1 provided an overall positive evaluation of this revision. I also commend your responsiveness in addressing all the comments offered to the initial submission. As a result, I can say that this manuscript has been improved considerably and in a much better shape as a meaningful contribution to the literature. Nevertheless, there still remain a number of conceptual and analytical issues to be resolved as detailed below. Thus, I would like to invite you to revise and resubmit this paper one more time. In the next revision, please carefully consider the following issues and further clarify the theoretical and empirical contributions of the study.

1. As Reviewer 1 mentioned, the current paper is based on fairly simple and straight forward theoretical model as depicted in Figure 1 with three sets of hypotheses. However, very noticeably, your theory section is not consistent with this figure and presented only two hypotheses. Even worse, your results section seemed to be based on another set of hypotheses you had in your mind, which was different from the hypotheses depicted in Figure 1 and those presented in the theory section. Please clarify this confusion throughout the paper.

- *We sincerely apologize for this misunderstanding and have now clarified this throughout the manuscript. First, on page 6 we describe Hypothesis 1; on page 10 Hypothesis 2, and on page 12 Hypothesis 3. Second, on page 15 (par. 4, lines 3-4) page 16 (cont. par. Lines 1-13) we have explained the structural models to test our hypotheses (H1 tested by M2; H2 tested in M3; H3 tested in M4, and alternative model M5). Next, on page 19 we specify the hypothesized model (M4) results (first paragraph). Finally, the alternative final model is depicted in Figure 2 (page 18). Together, this should make the results section clearer and consistent with the remainder of the manuscript.*

2. In the current formulation, Hypothesis 1 sounded very informal. What do you mean “by means of”? I urge you to take more formal, scholarly language here. In addition, given that you are suggesting a relationship between team cohesion (TC) and team creative performance (TCP) mediated by team task engagement (TTE), it would

be reasonable to have a main effect hypothesis linking TC to TCP before you introduce the mediating hypothesis involving TTE. Related to the mediating role of TTE, I was surprised that most of your arguments were about the main effect of TTE on TCP rather than how it "mediates" the TC-TCP relationship. Please elaborate on this issue by first specifying that TC predicts TCP, and then explain that such a link between TC and TCP is present owing to the development of TTE.

- Thanks for your suggestions. We have modified the revised manuscript accordingly: First, we have used a more scholarly language here (see page 5, third par., lines 4-7; page 6, cont. par. Lines 1-12) to develop a formal hypothesis: H1. Team Cohesion relates to Team Creative performance (p. 6, first par.).

Second, we have thoroughly rewritten our arguments to explain the mediating role of team task engagement. To this end, we first focused on our arguments to explain how Team Cohesion predicts Team Creative Performance (please, find changes on see page 5, third par., lines 4-7; page 6, cont. par. Lines 1-12). Second, we have focused on the argumentation linking Team Cohesion to Team Task Engagement (inspired by JD-R) (see page 7, 2nd par. Lines 2-4) . Third, we have now explained how Team Task Engagement should be related to Team Creative Performance by drawing on intrinsic motivation theory, as you suggested, and then the mediating role of TTE (please see changes in p. 9, complete 1st par.).

3. I am still wondering if the JD-R model is appropriate in this study. You need to better position the role of this model in explaining the overall theoretical propositions here. In addition, you may want to integrate the prevailing arguments based on intrinsic motivation theory that explains the effects of context/situation/resources on creativity because TTE almost sounds like team-level intrinsic motivation. This might be another theoretical leverage that can be utilized to link TTE to TCP.

- Thank you for your suggestion. We have carefully considered how to tackle this issue. In the end, we have made the following changes in this section: (1) We have offered a caution regarding the straightforward translation from individual-level constructs to team-level constructs (Chan, 1998, JAP) (see page 7, 2nd par. Lines 6-12), and instead explained our conceptual strategy. We have only used the underlying rationale of the JD-R model and intrinsic motivation theory, without relying on previous

empirical findings at the individual level or drawing too heavily on their individual-level conceptualization. Thus, we have drastically lowered the tone used in the manuscript regarding the role of the model. Second, we have dropped references to the JD-R model when explaining the link between Collective Task Engagement and Team Creative Performance altogether and instead, as you recommended, we built upon the intrinsic motivation theory to better back our theoretical propositions. Please find these changes on p. 8, 1st par., lines 2-14, 22-24; p. 9, 1st par. Lines 1-18,). We hope these changes address your concerns about the inappropriate use of an individual-level model to make hypotheses at the team level.

4. In your explanation of the link between perceived team performance and TC in the next episode (pages 10-11), you tend to mix various constructs including such as trust and team efficacy with TC. Also, at some point, you argue for the effect of cohesion on performance rather than the other way around. Please be focused on what you try to explain. Also, perhaps more importantly, through meta analytic studies, we know that TP more strongly predicts TC than TC predicting TP. What is the distinct contribution of proposing and demonstrating the effect of TP on TC in this study? You should clarify this one instead of just arguing that the TP-TC connection was identified along with the mediating role of TTE (page 23, lines 3-10).

- Thank you for your guidance and suggestions. We have tackled this concern in two ways: (1) we have removed the arguments about constructs that might be misleading and confusing for the reader. As a result, we think that the text is now much clearer (please see changes on p. 8, 1st par., lines 1-10).

(2) Regarding the role of cohesion and performance, we have built on the recent article of Mathieu et al. (2015) to briefly summarize the current status of research on team cohesion and team performance, acknowledging the reciprocal relationships and the seemingly stronger effect of TC on TP than vice versa. Next, we have included three additional rationales explaining why our study contributes to this debate: (a) there are few studies examining such reciprocal relationships (as demonstrated by the repeated calls for studies and the lack of response to them, as lamented by John Mathieu); (b) we have explained how the dynamics might play out differently in temporary teams, as they have less of a performance history; (c) we have explained how the relationship may play out differently when focusing on creative task performance instead of on

"traditional" task performance, as creative task performance introduces more uncertainty. Please find changes on p. 10, 2nd par., lines 10-17, and discussion section page 21, 2nd par. Lines 4-6. As per your suggestion, we have also discussed the TC-TP relationship in the discussion section, in the sense that at least in creative tasks in temporary project teams, perceived past performance predicts team cohesion in the future more strongly. We found that the motivational process by means of which team cohesion predicts creative team performance (objective and subjective measures) is team engagement. In fact, team perceptions of past performance enhance future team cohesion but only when team engagement is present. However, in the text we warned about the need to take into account how performance is measured. Please see the changes on p. 21, 2nd par. lines 11-12.

5. Reviewer 1 kindly mentioned several mechanical errors in your writing. In my view, this version needs a serious effort for cleaning up all grammatical and typographical errors, which I found to be quite distracting throughout the manuscript. I encourage you to consider obtaining editorial help from professional editors. Relatedly, please adhere to the APA guidelines for formatting your paper including the text, references, tables, and figures.

- *We sincerely apologize for the inconvenience. It is clear that as non-native speakers, we do not always reach the level of English proficiency we would like to attain. To address this problem, we have had this version proofread by an expert professional English native speaker. We hope that the manuscript reads better now and is much clearer. Finally, we have redoubled our efforts to avoid any mistakes in formatting according to APA style.*

6. In addition to what Reviewer 1 mentioned regarding SEM, conducting the three separate sets of CFA for three episodes as reported in the text and Table 2 is not acceptable. For CFA of multi-wave panel data and alternative CFAs, please refer to the following article: Price, R. H., Choi, J. N., & Vinokur, D. A. (2002). Links in the chain of diversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health. Journal of Occupational Health Psychology, 7, 302-312. You may also refer to this article for the generation and testing of alternative structural models (Table 3). In this respect, you may identify and test additional structural models that are theoretically plausible, as Reviewer 1 suggested.

- Thank you very much for your advice and for pointing us to such a useful example. In the revised manuscript, we follow Price et al. (2002) to calculate CFA (please, see p. 15, 2nd par., lines 2-9; and p. 18, 1st par., lines 1-3). In addition, we also followed Price et al. (2002) to test alternative structural models (please see p. 15, 4th par., lines 1-3, page 6 cont. par. Lines 1-14, 1st par. 1-3). Thus, as a result of both your and Reviewer #1's suggestions, we ran the extra analyses reported in the results section. You can find the changes throughout the whole section. Please see pp. 17 - 19. Additionally, you will find further explanations on the changes in this section in our reply to Reviewer #1, comment 3.

Minor issues:

7. Page 4, line 35: "Given that…" – this sentence is not needed here.

- Checked and changed.

8. Page 4, line 48: "the factors contributing" – what do you mean? Mediating? Moderating?

- Checked and changed using the term 'mediating'.

9. Page 4, line 52: "how long does social cohesion take to develop?" – does this study address this issue?

- Checked and deleted.

10. Page 5, line 9: "In addressing the former questions…" – then what happened to the "latter question"?

- Checked and changed accordingly.

11. Page 5, line 40: "provides a comprehensive theoretical framework" – please tone down.

- Checked and changed.

12. Page 6, line 55: grounthinking – correct it to groupthink.

- Checked and changed.

13. Page 7, line 8: "the implication of team members" – what do you mean?

- *Checked and changed, see now p. 7, cont. par., line 1-2, page 8, 1st par. Lines 9-12.*

14. Page 7, line 35-42: this last sentence should be specified with more details. Here, you clearly need to provide stronger rationale for equating team cohesion as "resources".

- *Checked and changed, we rewrote the introduction, see comment 4, and specifically see p. 8, 1st par., lines 13-17.*

15. Page 8, line 51: "collectively appraised employee performance"?

- *Checked and changed.*

16. Page 10, line 58: "where team social resources are allocated to optimal teamwork" – not sure what you mean here.

- *Checked and deleted.*

17. In the method section, please specify the cultural/national context of the empirical study. In addition, you should report the mean and SD of team size.

- *Done, we have added the necessary cultural/national information. Please see p. 13, in the sample and procedure subsections.*

18. Page 14, lines 46-49: these citations are too old for the current standard.

- *Checked and changed in the text to James et al. (1993).*

19. Page 15, lines 3-12: ICC and rwg (wg should be subscripts) may reflect the within-group agreement, but not "inter-rater" agreement. Perhaps reporting kappa or other inter-rater agreement indexes?

- *Checked and changed*

20. Please be careful when you use the terms such as "mutual" or "reciprocal" throughout the paper. These terms can be somewhat misleading.

- *Checked and changed throughout the text, by changing the concept of 'mutual' to 'reciprocal' when needed (i.e., p. 4, 2nd par. Line 4).*

21. Page 17, lines 22-56: given the prevalence of SEM analysis nowadays, you don't have to explain the meaning and criteria of various fit indices.

- *Checked and deleted the redundant information in this regard.*

22. Page 18, line 50: Please check the accuracy of .85 as a mean value.

- *Checked and changed.*

23. You may delete “To note” in most cases.

- *Checked and deleted.*

24. Page 25, lines 3-15: this discussion about composition model related to aggregating individual ratings has been widely discussed and already resolved in my view in the literature.

- *Checked and deleted.*

25. For Table 1, even though Reviewer 1 suggested that possibility of putting M and SD in the bottom of the table, I’d maintain the format with M and SD appearing in columns because this is a typical format used in most articles in GOM.

- *OK, we have followed your advice. Thank you very much for your detailed comments and all the valuable input you have provided us with.*

I have tried to synthesize the issues raised by each reviewer but obviously I would encourage you to consider each of their comments as they have not only raised the concerns that they have with your manuscript but have also provided suggestions and citations that should prove beneficial as you develop this work. I do hope that you will find the enclosed reviews useful and hope that you will be able to adequately address the points raised by the reviewers.

In revising your manuscript, please carefully consider each reviewer comment, especially those that were mentioned in my decision letter. Your responses document should provide point-by-point responses to my comments, as well as those of the reviewers. If the same issue is alluded to in my letter and in the reviewers’ comments, please provide your detailed response in the reviewers’ portion of the responses document only. In your response to my comment, simply refer me to the relevant page number of the reviewers’ portion and I will flip to that discussion. This is meant to keep the length of the responses document manageable by preventing the copying of (or paraphrasing of) the same issues in multiple places. However, I would encourage you to be as specific as possible in your responses to the reviewer(s). The responses document should appear at the very end of the revised manuscript, beginning on a separate page. Please ensure that it maintains your anonymity and does not include any author

identifying information. It would be helpful if you would reproduce the original action editor and reviewer comments in the document, directly above the relevant responses, just in case the reviewers do not have a record of their original review.

To revise your manuscript, log into http://mc.manuscriptcentral.com/gom and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision. You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Once the revised manuscript is prepared, you can upload it and submit it through your Author Center.

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission. Because we are trying to facilitate timely publication of manuscripts submitted to GOM, your revised manuscript should be uploaded as soon as possible. If it is not possible for you to submit your revision in a reasonable amount of time, we may have to consider your paper as a new submission.

In our experience, revisions proceed more smoothly when reviewers maintain a clear memory of their original reading of the manuscript. Thus, please upload your revision through the Manuscript Central system within three months of the receipt of this letter. Adherence to this due date is much appreciated, though extensions may be granted if appropriate.

Thank you for considering GOM as a potential outlet of your research. I look forward to receiving your revision in due course.

With best wishes,

Jin Nam Choi
Associate Editor
Professor of Organizational Behavior

COHESION, ENGAGEMENT AND CREATIVITY PERFORMANCE ON TEAMS

Graduate School of Business
Seoul National University
1 Gwanak-ro, Gwanak-gu
Seoul 151-916, South Korea
Office: 82-2-880-2527
Email: jnchoi@snu.kr
http://cba.snu.ac.kr/en/faculty?memberidx=21101&major=5&mode=view&part=intro

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Author
The paper is well done. The data collection effort is impressive. We need more careful, longitudinal studies of team creativity. The authors seem to have done a good job of responding to the reviewers' remarks, although only about half the references suggested by reviewers were added to the paper.

The title has been improved following Reviewer1's suggestion.

- *Thanks a lot for your words in this regard.*

Some typos remain:
(1) In the Abstract and on p. 7 lines 3 and 10 say "meditational" should probably be "mediational." It is not explained elsewhere and so should be clarified.

- *Sorry, that was a typo, it has now been changed to mediational.*

(2) P22 – 12 – "inn" instead of "in"

- *Thanks, yes, this has now been changed.*

Team self-perception was measured by brief scales. They are well justified, however, only three items were used for each. The items are not listed and no criteria are present for how each was selected from the longer scales in Salanova et al., 2003. I suggest listing the items and describing the process of choosing them.

- We agree with your comment. Thus, we now explain in the text which scale we chose those items about collective task engagement from (please see p. 13, 4th par., lines 2-4). They were in fact taken from the short version of the Utrecht Work Engagement Scale (Schaufeli et al., 2006); we used the validated short scale and reworded them for collective/team reference. They are Vigor (three items, e.g., 'during the realization of the task, my team felt full of energy'; 'my team could continue working for very long periods at a time'; 'my team felt strong and vigorous during the task'); Dedication (three items, e.g., 'my team was enthusiastic about the task'; 'my team liked doing the task'; 'my team felt motivated to a good job'), and Absorption (three items, e.g., 'time flew when my team was working on the task'; 'when my team was working, we forgot everything else around us'; 'my team felt happy when we were engrossed in the task'). In the text we have just reported an example of each three. However, if you consider it necessary to report all of them, we will be happy to do so.

Table 1 – reliability information is missing for row 5. The table would be a little easier to read if the Means and Standard deviations were moved the bottom two rows.
Note the means for Cohesion across the three times and the means for Engagement. What explains the decrease across time? Does that impact correlations among key pairs of variables?

- Thanks a lot for your comment, we have now checked and changed the reliability information for row 5 about T2 Team engagement in Table1.

Regarding the table format we leave it according to the Editor's suggestion. On the other hand, regarding the decrease in means over time, we checked it and the decrease is not significant. We noted that there is a general tendency in all the variables to decrease over time; this may be due to the effect of the novelty of the first session.

I am surprised at the lack of correlation between Output measures for T1, T2, and T3 when Perceived Performance correlates with Output measures in a logical way.

- *This is a good point, thanks a lot for raising it. However, the outputs of each wave (each session) were different from one to another, so they were independent outputs.*

10-8 says “This may be especially true for project teams or temporary teams, which have scarce references of past experiences as a team.” This suggests that one future research project might be testing the model with teams working together one or more years which could be added in the last section.

- Thanks for your bright insight; we have included this idea in the ‘limitations and future avenues for research’ section: ‘future research might evidently benefit from conducting longitudinal studies on consolidated teams in the field to ensure the external validity of our findings’ . Please see p. 25, 2nd par., lines 8-10.

The purpose of SEM fit indices is to test whether the relationships between variables in a model (paths that are included plus paths that are excluded) account for covariance in the data matrix (Table 1). Good fit indices such chi-square or RMSEA indicate the fit of the theoretical model to the data is good. In Table 2, fit looks good but not great. The Oblique model fits a little better either because there is shared method variance in the measurement or because in the “real world” relationships between what we call “variables” is messy. Fit indices in Table 3 indicate there is variance in the data matrix not accounted for – fit is somewhat poor. The theoretical model in Figure 1 clearly indicates the three time periods and the hypothesis that the team’s perception of its own performance will influence Cohesion the next round. The model is clear and simple. That simplicity may mean some influences are being ignored. For example, a careful look at the data matrix shows a statistically significant correlation between Team Cohesion at T2 and Task Output Creativity at T3. Similar relationships have been shown in the literature (e.g., Mathieu, et al. 2015 and Mullen, Driskell & Salas, 1998 listed below). Is the influence of T2 Cohesion on T3 Creativity indirect through T3 Cohesion or does it operate through another channel? That kind of question should be examined by testing variations of the theoretical model.

- Thank you very much for your comment – in fact we ran extra analyses and modified the results section accordingly. Then we tested a set of alternative models (please see p. 16, 1st & 2nd par.; and p. 18, entire paragraph). As a result of the former analysis, we found that T2 team cohesion also influences T3 output creativity but not perceived performance. We argue about that idea in more detail in the discussion section (please see p. 21, 2nd par., lines 6-12).

Mathieu, J. E., Kukenberger, M. R., D'Innocenzo, L., & Reilly, G. (2015). Modeling reciprocal team cohesion-performance relationships, as impacted by shared leadership and members' competence. *Journal of Applied Psychology*, 100(3), 713-734.
Mullen, B., Driskell, J. E., & Salas, E. (1998). Meta-analysis and the study of group dynamics. *Group Dynamics: Theory, Research, and Practice, 2*, 213–229.