Optimizing the Outcomes of Creative Collaboration

Creative collaboration can consist of a variety of stages from divergent idea generation to implementation. It is important for groups to generate a broad range of ideas in order to increase the chance of coming up highly innovative and potentially useful ideas. Thus it is important to structure idea generation sessions to optimize the production of novel ideas. The leadership style and approach of the team or group leader can also influence the creativity of group members. At that point it is important for the group to select the best ideas for potential further elaboration and possible implementation. When the group selects an idea for possible implementation, it needs to "sell" the idea to the corporation or potential investors. The four presentations of this symposium highlight research findings on each of these topics.

The Effect of Problem Construction on Team Process and Creativity

Interest and research on team creativity has increased in recent years as a result of understanding that the problems that face organizations are too complex for one individual (Kozlowski & Bell, 2008; Shalley, Zhou, & Oldham, 2004). However, less research has directly evaluated the factors that influence team creativity as a construct, as opposed to individual creativity within the team context. One aspect of creativity that has been studied extensively at the individual level, and has not been evaluated fully at the team level, is that of specific creative problem solving processes. Models of creative problem solving at the individual level indicate that creativity is a complex process, which starts with problem construction identification and construction (Mumford, Mobley, Uhlman, Doares, & Reiter-Palmon, 1991).

Problem identification and construction refers to the process in which a problem is identified, structured, and the parameters of that problem are defined. At the individual level, creative individuals have been shown to engage in the process more so than their less creative

counterparts (Getzels & Csikszentmihályi, 1975; Rostan, 1994). Past research has demonstrated that active engagement in problem construction, through the use of instructions, has increased the creativity of the solutions developed (Arreola & Reiter-Palmon, 2016; Reiter-Palmon, Mumford, Boes, & Runco, 1997), but it is not clear what happens in teams (Reiter-Palmon, Herman, & Yammarino, 2008).

The first goal of the study was to determine how instructions for problem construction should be specified for a team. At the individual level, this is accomplished by asking the individual to restate the problem in many different ways, prior to solving the problem. At the team level, these instructions could be given to individuals or to the team as a whole. The second aim was to determine whether explicitly engaging problem construction prior to solving a problem in a team context resulted in increased solution quality and originality, replicating results from individual level findings. Finally, it was of interest to identify whether engagement in problem construction influenced any team processes.

The study was conducted using 65 three person groups. The total number of participants was 195, of which 109 were female (57.1%) and 82 were male (42.9%). Average age was 22.88 (sd=6.26). Groups were randomly assigned to one of four conditions. All groups were presented with a real-life problem relevant to students and were asked to solve the problem as a team. The first condition was a control condition in which the team was not specifically asked to engage in problem construction. The other three conditions were variations on a problem construction manipulation. In the second condition participants were asked generate as many restatements of the problem as they could individually, and then proceeded to solve the problem as a team. In the third condition, participants engaged in both problem construction and solution generation as a team. Finally, in the fourth condition, participants were asked to generate as many restatement as

they could to the problem individually, then reach consensus on these as a team, and then move on to developing a solution. Once the team completed the solution generation task, participants completed a number of measures including satisfaction with the team process and team outcome, a measure of team conflict and demographics. Solutions were then rated for quality and originality using a modified Consensual Assessment Technique (Amabile, 1996). Three trained raters evaluated each of the solutions for either quality or originality. Inter-rater reliability were above .80

The three conditions of problem construction were compared to determine if one of these approaches resulted in better performance. No group differences on solution quality and originality were found based on the instructions for problem construction, so the three conditions were collapsed into one. There were 19 groups in the control condition and 46 groups in the problem construction condition.

Results comparing these two conditions with regards to solution quality and originality indicated that there were no differences in solution quality, however marginal differences were found t=1.435, p=.075. Teams that engaged in problem construction generated more original solutions (M=2.75) compared to those that did not engage in problem construction (M=2.34). Also of interest was whether teams that engaged in problem construction were different than team that did not in terms of satisfaction and conflict. Results indicated that both outcomes and process satisfaction were higher when teams engaged in problem construction compared to teams that did not (M=4.20 vs. M=4.91, M=4.32 vs. M=4.07 respectively). For conflict, all subscales – task conflict, relationship conflict, and process conflict were lower for teams that engaged in problem construction compared to teams that did not (M = 1.65 vs. M=2.02, M =1.13 vs. M = 1.28, and M = 1.17 vs. M=1.34 respectively).

The findings above suggest that team problem construction can be beneficial for creativity through its effects on originality. Further, team problem construction may facilitate some of the social processes that then can help in effective problem solving by reducing conflict and increasing satisfaction. It is possible that the specific instructions for problem construction reduced some of the ambiguity associated with solving ill-defined problems, and therefore reduced conflict and increased satisfaction.

When and why paradoxical leaders matter for employee creativity: integrating paradox theory with social cognitive perspective

Applying a paradox lens to creativity suggests that a core challenge in generating novel and useful outcomes lies in tensions among the competing goals of generating novelty while at the same time satisfying organizational constraints to achieve usefulness. Consequently, uncovering factors that promote or inhibit employees' capability of dealing with tensions in creativity is of vital importance (Hill, Brandeau, Truelove, & Lineback, 2014; Miron-spektor & Beenen, 2015; Miron-Spektor & Erez, 2017). Previous research has focused on the role of leadership that embraces a "both/and" approach toward tensions and paradoxes, and has found that such leadership plays an important role in managing tensions in innovation, strategic decision making, and people management (Rosing, Frese, & Bausch, 2011; Lewis, Andriopoulos, & Smith; Zhang, Waldman, Li, & Han 2015). To the best of our knowledge, however, no research has examined the role of paradoxical leadership in employee creativity.

Given the paradoxical nature of creativity, we suggest that paradoxical leadership can be a potential predictor of employee creative performance. The present research therefore aims to deepen our understanding of the role of the leader in managing the tensions inherent in creativity. In particular, combining social-cognitive theory (Bandura, 1986) with paradox theory (Smith &

Lewis, 2011), we clarify *why* and *when* paradoxical leader behavior (PLB; Zhang, Waldman, & Han, 2015), behavior that embraces both/and approach to address tensions, relates to employee creativity.

We firstly propose that social-cognitive theory provides a mechanism why PLB may relate to employee creativity, which is that it stimulates creative self-efficacy (Tierney & Farmer, 2002). By role modelling how to deal with tensions and paradoxes at work in a constructive way, supervisors may help employees build their self-efficacy in dealing with the tensions involved in creative work. In turn, creative self-efficacy will be positively related to creative performance. Secondly, we propose that paradox theory suggests the conditions under which leaders that take an "both/and" approach will be effective, namely in situations of resource scarcity and only for employees who are high in cognitive complexity. We propose that in particular in situations of resource scarcity, such as high workload, tensions are manifest and paradoxical leaders are more effective role models. Second, being confronted with paradoxical leader behavior in situations of resource scarcity may be stimulating to some, but confusing to others. In particular, we propose that individuals' creative self-efficacy is most likely to benefit from PLB and tensions resulting from high workload when employees have enough cognitive complexity to understand, appreciate and act upon PLB (see Figure 1).

To test our hypotheses, we collected data from employees and their direct supervisors operating in various sectors in organizations in the Netherlands and Germany. Supervisors were asked to evaluate their employees on creativity, and employees were asked to rate PLB of their supervisor, their personality, experience, and work environment. The results from multilevel analysis based on data from 248 employee-supervisor dyads showed that through creative self-efficacy, PLB was most effective in promoting employee creativity when workload and

cognitive complexity were both high. We also found that PLB had a negative indirect effect on creativity when workload was high and cognitive complexity was low (see Figure 2).

This research makes serval contributions to the literature. Firstly, applying a paradox lens to creativity contributes new, distinct insights on the leader's role in managing employee creativity. Secondly, the current research also contributes to the growing literature on paradox theory by showing that paradoxical leader behavior (leader behavioral complexity), employee cognitive complexity and demanding work conditions interactively influence employee creative performance. Moreover, we extended paradox theory with the insights from social cognitive theory. Specifically, we showed that self-efficacy is an important mechanism that explains the effects of paradoxical leadership on employee creativity. Finally, in response to the call for investigating PLB in Western contexts (Zhang et al., 2015; Zhang, Chen, Chen, & Ang, 2014), to our knowledge, our study is among the first to test the effects of PLB on creativity in a Western context..

Divergence to Convergence in Collaborative Creativity: Predicting the Final Product

There is an extensive literature on collaborative creativity in laboratory contexts that has involved objective measures of performance (Paulus & Coskun, 2013). However, most of this literature has focused in the divergent phase in which the goal is to generate a large number of novel ideas. Only a few studies have examined the subsequent process of selecting the best ideas and developing a final product (Harvey, 2013; Putman & Paulus, 2009; Rietzschel, Nijstad & Stroebe, 2006). Groups are typically not very good at picking the best ideas and tend to have a bias toward feasible ones. The bias against novel ideas is also found in organizations (Mueller, Melwani, & Goncalo, 2011). We know of no studies that have examined the relationship between the processes in the divergent phase and the final product developed during the

convergent phase in which a final product is developed. In this study we asked 230 students in groups of four to use an electronic discussion board to generate ideas about developing a new sport, vote on the ideas and reply to ideas and then come up with a final product in three sessions over a period of three weeks. The first session involved generating ideas individually for 30 minutes. In the second session, participants were asked to read all of the ideas generated by their group in session 1 and indicate with ideas they thought were the best. After 10 minutes, they were instructed to generate additional ideas and build on the ideas of the group. In the third session participants discussed the shared ideas. They were asked to examine the shared ideas and replies to and to come to a consensus about a new sport. The groups were composed on the basis of expertise related to sports (experience and interest) as determined by a pre-test. One condition consisted of four members who were low on this dimension, in another all were high on this dimension, and in a third two were high and two were low. Prior research on group creativity has not examined the role of levels of creativity on a singular dimension in divergent thinking or convergent decision making. Although expertise is often related to higher levels of individual creativity (Ericksson, 2013), it can also be related to fixation and reduced creativity (Dane, 2010; Wiley, 1998). Consistent with the fixation perspective the low expertise groups generated the most ideas, most replies and the most novel ideas. The mixed expertise group was generally lowest on those dimensions, suggesting that the diverse levels of expertise and interest inhibited the creative process, consistent with other research suggesting gaps in expertise can be problematic for collaborative creativity (Cronin & Weingart, 2007). Participants also indicated votes as to ideas they thought were novel. These votes were indeed related to actual rated novelty by trained coders. Thus there was no evidence of negative reaction to novel ideas that is sometimes observed (Mueller et al., 2011). Moreover, the mixed expertise condition had the

highest degree of voting for novel ideas. However, the three conditions did not influence the rated novelty of the final sport. However, path analytic analyses revealed that greater number of group-level number of replies predicted higher reply novelty, which in turn, predicted higher final product novelty. Thus the novelty of the final product was not influenced by the overall creative outcomes in the three conditions or the recognition of novel ideas, but instead it was influenced by the interactional dynamics of specific groups. Groups that were highly engaged in replying to shared ideas tended to produce more novel ideas and in turn develop a more creative final product. This outcome is consistent with the theoretical models that emphasize the importance of elaboration processes in collaborative creativity (Harvey, 2015; Van Knippenberg, De Dreu, & Homan, 2004). Our findings are also consistent with research on collective intelligence which has found that equality of contributions in a group is related to higher levels of group performance across a range of tasks, including electronic groups (Woolley, Aggarwal & Malone, 2015).

Does Team Self-promotion Contribute to Entrepreneurial Success in Pitching Events?

The importance of gaining legitimacy in the eyes of potential investors and of securing financial investments is widely recognized (Clark, 2008). The interaction between entrepreneurs and potential investors is a multistage decision-making process that usually begins in a pitch meeting, in which the entrepreneurs present their business idea to the investors (Chen, Yao & Kotha, 2009). Most pitch meetings fail, and thus scholars and practitioners are increasingly interested in understanding the psychological factors that explain the decision to invest. In response, we contribute to the understanding of factors that increase entrepreneurial success in pitch presentations. Unlike previous studies that examined individual entrepreneurs (e.g., Clark, 2008), we focus on characteristics and behaviors of entrepreneurial teams. The decision to invest

in entrepreneurs is mainly based on trust, or the extent to which the investors perceive the entrepreneurs as competent and trustworthy (Mayer, Davis, & Schoorman, 1995). We draw on impression management theory (Rosenfeld, Giacalone, & Riordan, 1995), to suggest that for an experienced team, engaging in self-promotion can help the team gain trust from investors. When members engage in *team self-promotion* they present their teams' positive characteristics and accomplishments during their pitch (Scopelliti, Loewenstein & Vosgerau, 2015). Yet, if the team lacks relevant experience, highlighting the team's qualities can backfire (Chen et al., 2009). When there are discrepancies between the presented competencies and prior accomplishments, engaging in self-promotion can create negative affect and impede trust (Scopelliti et al., 2015). Thus, our moderated mediation model suggests that past experience moderates the indirect effect of team self-promotion on the decision to invest through perceived competence and trustworthiness.

We tested our model in the semifinals of the BizTEC entrepreneurial competition at the Technion. The competition invites entrepreneurial teams that develop technology-based ventures in the seed, start-up or early stages. We collected data during 2013-2015 in three competitions. Overall, 48 entrepreneurial teams (121 entrepreneurs) participated in our research. Data was collected from three different sources. The team members reported their prior experience and the extent to which they tend to engage in self-promotion (Bolino & Turnley, 1999). The competition committee evaluated the quality of the ventures based on the pitches (e.g., product and business plan quality). In addition, two trained judges, blind to the competition results, watched the teams' videotaped pitches and evaluated their competence (Fiske, Cuddy, Glick and Xu, 2002) and trustworthiness (McGinnies & Ward, 1980). This approach enabled us to avoid

common method bias and isolate perceptions of competence and trustworthiness from the final decision made by the committee members.

The findings supported our model. The indirect effect of team self-promotion on entrepreneurial success through competence was positive for highly experienced teams (b = .68, s.e. = .23, [.33 to 1.24]) but negative for teams that lacked prior experience (b = -.39, s.e.= .18, [-.79 to -.08]). Similarly, for highly experienced teams, the indirect effect of team self-promotion on entrepreneurial success through trustworthiness was positive (b = .44, s.e.= .23, [.06 to .97]), but this effect was negative for less experienced teams (b = -.26, s.e. = .18, [-.65 to .03]. Together these findings suggest that the decision to invest, largely depends on trust, and that teams can gain trust from investors by presenting and highlighting the qualities of their teams. Yet, not all teams benefit from self-promotion. If the team lacks prior experience, presenting the teams' accomplishments can impede trust and reduce the likelihood for potential investment.

Appendix
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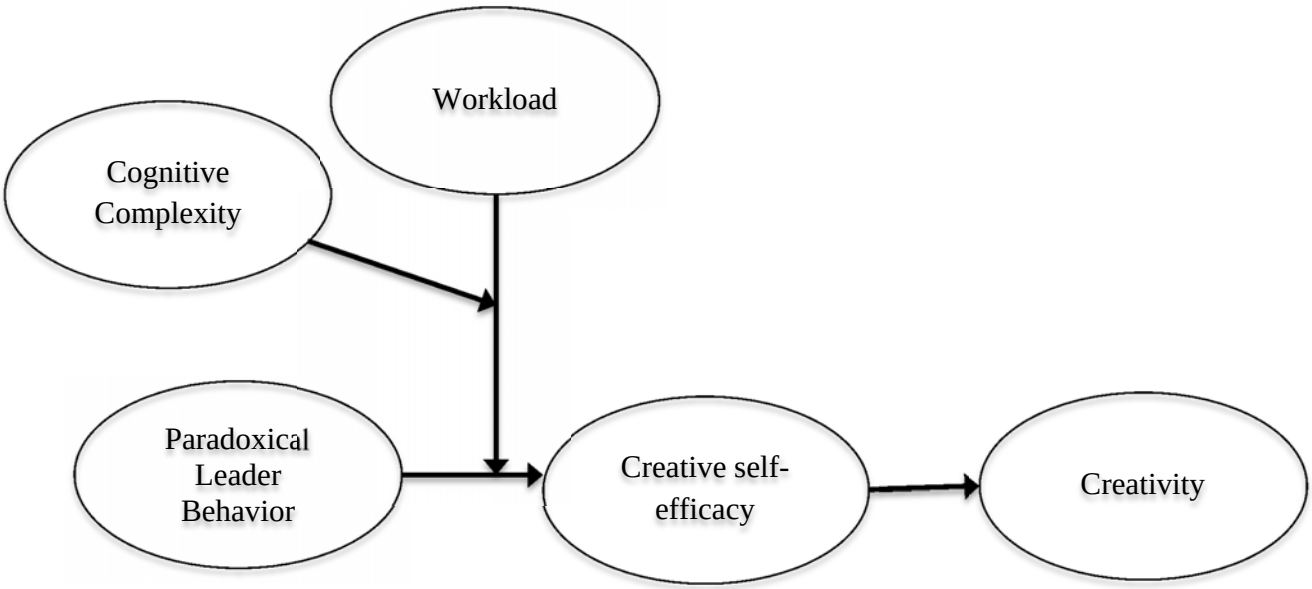

Figure 1 The conceptual model.

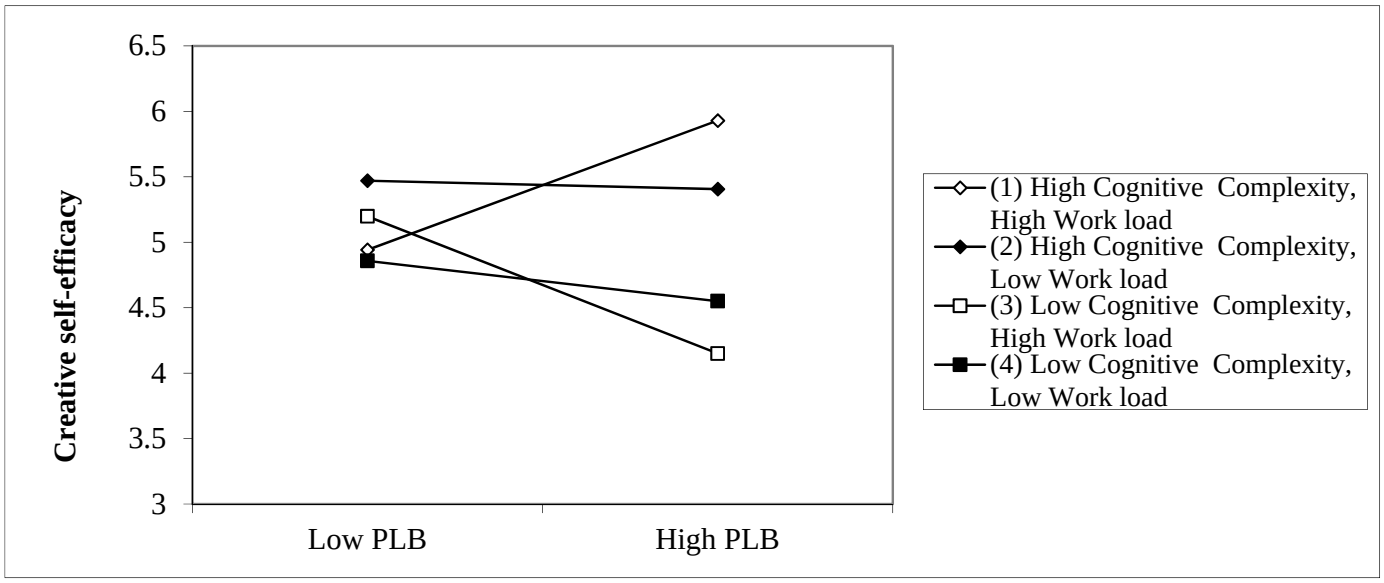

Figure 2 Effects of three-way interaction among PLB, cognitive complexity, and workload on creative self efficacy