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**Strategies to Improve Selection of Creative Ideas:
An Experimental Test of Epistemic and Social Motivation in Groups**

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Abstract

Pre-implementation activities like idea selection play a crucial role in the innovation process. However, groups of people seem to perform rather poorly when it comes to selecting creative ideas for implementation. The Motivated Information Processing in Groups model (MIP-G) (De Dreu, Nijstad & Van Knippenberg, 2008) provides an explanation as to why some groups outperform others when it comes to making group decisions. On the basis of the MIP-G framework, we hypothesized that groups that are both epistemically and prosocially motivated would outperform other groups in selecting creative ideas. Contrary to our hypothesis, a 2 x 2 experiment in a field sample (N = 240 or 80 three-person groups) showed that under conditions of high epistemic motivation, proself motivated groups selected significantly more creative and original ideas than prosocial groups. Proself motivated groups did not differ significantly from the prosocial motivated groups in selecting feasible ideas under conditions of high epistemic motivation. Our results suggest that the MIP-G framework may need refinement to increase our future understanding of group idea selection. To this end, we propose three specific avenues for future research.

Keywords: Innovation; group decision; creativity; idea selection; motivated information processing.

Strategies to Improve Selection of Creative Ideas:

An Experimental Test of Epistemic and Social Motivation in Groups

Schumpeter (1942) identified innovation as the critical dimension of economic progress. According to Schumpeter, entrepreneurs play a key role in progress through innovation. These insights have spurred research on innovation and entrepreneurship over the past decades. However, looking back at this body of research, Zachary & Mishra (2011) questioned the idea of the lone entrepreneur: “*No individual can achieve anything without the involvement of others*”(p. 2) raising the question: “*Can it not be that creativity and innovation can occur at the group level, with a combination of individuals reaching higher outcomes than just one person?*” (p. 3). This perspective encourages researchers to look beyond the individual level as unit of analysis, to instead rely more on group-level approaches and to identify more intangible entities and psychological processes related to the entrepreneurial phenomena. The current study aims to contribute to this line of research by examining how groups select creative ideas.

As multiple potentially valuable creative ideas typically compete for scarce resources at the same time, some form of idea selection is needed to identify the best ideas for implementation. The mere generation of creative ideas does not necessarily imply their implementation into successful innovations (Baer, 2012). In a comprehensive review of creativity and innovation research, Anderson, Potočnik & Zhou (2014) concluded that the subfields of idea generation and idea implementation “remain doggedly disconnected to one another, akin to two siblings who fell out at a family gathering in their distant past” (p. 1317). The final goal of an innovation process is to implement only one or a few creative ideas, or, as Girotra, Terwiesch and Ulrich (2010, p. 591) put it, “the success of idea generation in innovation usually depends on the quality of the best opportunity identified”.

Unfortunately, our understanding of idea selection, as the process linking the two key innovation phases, generation and implementation is remarkably scarce and in need of strong theoretical underpinnings. For instance, in a recent interview with Creativity and Innovation Management, Paulus (2013) stated: “The cognitive approach to idea selection is obviously the next phase, and we need to start looking at that.” (p.98). Several studies that looked at idea selection found that groups as well as individuals perform surprisingly poor at recognizing and selecting creative ideas (e.g. Faure, 2004; Putman & Paulus, 2009; Rietzschel, Nijstad & Stroebe, 2006). When instructed to select the best idea out of a pool of generated ideas, groups of students did not select the ideas that received high creativity ratings by independent judges. In fact, Rietzschel et al. (2006) found that the idea selection process was hardly more effective than taking a random sample of ideas. These findings reveal a major problem for innovation. If successful idea generation is followed by poor idea selection, the innovation process loses a great deal of its potential value.

During idea selection, a group of people has to make a decision about which idea to promote and implement. As idea selection can be depicted as a specific form of group decision-making, we argue that a better theoretical understanding of the motivational underpinnings of the decision-making process in idea screening groups could be the key to improving creative idea selection. To this end, we argue that it might be valuable to turn back to basic social psychology research, where fundamental models of the motivational dynamics of group decision-making have been articulated.

The Motivated Information Processing in Groups model (MIP-G) (De Dreu, Nijstad & Van Knippenberg, 2008) is a well-supported group dynamics framework that explains why some groups do not perform optimally on decision-making tasks (for an overview, see Nijstad & De Dreu, 2012). The present research aims to increase our understanding of the idea selection process in groups, using the MIP-G model as a guiding theoretical framework. On

the basis of this framework, we experimentally test two specific interventions, which are hypothesized to improve the idea selection process. We believe this paper uniquely contributes to the literature in three ways. First, we introduce a theoretical framework, developed in social psychology, to explain the underlying “why” question in recent idea selection research and guide future research on this topic. Second, we provide an experimental test of causality of idea selection groups dynamics using a relevant employee sample and objective idea quality ratings. Third, we demonstrate unanticipated, surprising findings that allow for actionable recommendations for innovation managers.

Note that our study did not simply seek to replicate previous MIP-G findings in the field. Instead, we extend previous idea selection research by testing the MIP-G model as a new guiding framework using employees, real-life cases and innovation experts as raters to enhance external validity. Therefore, we also tried to remain true to the methods and experimental research paradigm that have been typically used to test predictions following from this theory in social psychology. We believe such a consistent approach provides the best basis for comparison between previous decision-making findings and the best avenue to test the potential merits of this theory for guiding future idea selection research in organizations. However, we are aware of the limitations associated with the research paradigm. While the experimental method has been lauded as “the most potent research design for determining whether or not x causes y” (Highhouse, 2009, p. 554), others have shied away from using experiments in the organizational sciences as “the methodological requirements of traditional experiments fail to mesh with the realities of life in organizations” (Lawler, 1977, p. 577). Indeed, previous studies on the MIP-G model and on creativity are often conducted in laboratory settings, with student samples and hypothetical tasks (e.g. Bechtoldt, De Dreu, Nijstad & Choi, 2010; Brophy, 2006; Chamorro-Premuzic & Reichenbacher, 2008; Dugosh, Paulus, Roland & Yang, 2000; Garfield, Dennis & Satsinger,

2001; Litchfield, 2009; McGlynn, McGurk, Effland, Johll & Harding, 2004; Rietzschel et al., 2006). This is understandable from a practical point of view. After all, experiments in a field setting bring along a range of difficulties to overcome. However, this can be problematic from an organizational science point of view. Comparative studies suggest that students respond markedly different from ‘real’ employees in organizational settings (Mitchell, 2012; Peterson, 2001). To this end, we adopted an experimental design using real employees as participants, brainstorming with real-life colleagues on job-relevant creativity ideas. While we caution that this clearly is not a true field experiment with existing work groups, we believe this large-scale effort provides a balanced approach to address some of the most common methodological criticism to lab experiments in the innovation literature. Failing to locate a single adequately conducted intervention study with actual working employees, the recent comprehensive review of Anderson et al. (2014) urgently called for “the use of experimental and control group designs (...) to give direct empirical evidence on the efficacy of a range of creativity training techniques” (p. 1321). Thus, our study aimed at examining the effects of different interventions to increase our theoretical understanding of idea selection should be a timely and valuable contribution to the burgeoning creativity and innovation literature.

Theoretical Background

Creativity refers to the generation and development of ideas that are both novel and useful (Amabile, 1996; West, 2002). However, recent research suggests that the generation of creative ideas does not necessarily lead to their selection in groups (Rietzschel, Nijstad, & Stroebe, 2006). In this study, we argue that the selection phase in the creative process is a motivated process where both personal and social factors come into play. To understand how these factors might influence the selection of creative ideas in groups, we turn to the MIP-G framework.

The main assumption of the MIP-G model is that group level information processing is primarily driven by epistemic and social motivation (Nijstad & De Dreu, 2012). Epistemic motivation refers to the willingness of the group members to expend effort to achieve a thorough, rich and accurate understanding of the world, including the group task or decision problem at hand (De Dreu et al., 2008). According to the MIP-G model, epistemic motivation promotes the depth and care with which information is shared, processed, communicated and integrated in groups. Under low epistemic motivation, group members make evaluations based on quick heuristics. When group members experience high epistemic motivation, they engage in deep, deliberate thinking and systematic information processing to conceive a problem in all its complexity (Nijstad & De Dreu, 2012; Scholten, Van Knippenberg, Nijstad & De Dreu, 2007).

Social motivation is responsible for the type of information that is shared, processed and communicated. Social motivation can be prosocial or proself. Prosocial motivation refers to the extent to which group members seek collective gain, rather than personal (De Dreu, Nijstad, Bechtoldt & Baas, 2011). When group members are prosocially motivated, they will process and exchange information to foster collective outcomes. When group members are proself motivated, they will process information to foster individual outcomes (Nijstad & De Dreu, 2012).

The MIP-G model states that when elaborate team information processing is needed, groups under both high epistemic and prosocial motivation will share more information, process and integrate it deeper, and therefore come to better decisions than other groups. Several studies found support for the MIP-G model (for an overview, see Nijstad & De Dreu, 2012), including studies on group performance during idea generation tasks (e.g. Bechtoldt et al., 2010; Grant & Berry, 2011; for an overview see De Dreu et al., 2011). In sum, the MIP-G model provides a solid explanation on why some groups are able to outperform other groups

in making decisions. We suggest that the MIP-G model serves as a valuable framework for understanding idea selection, because selecting ideas in groups rests on the same basic tenets as more general group decision making. Similar to group decision making, during idea selection pooled group resources, insights, skills and abilities are needed to come to a qualitative selection (Hinsz, Tindale & Vollrath, 1997). These factors should be instrumental in analyzing the alternatives and identifying the best idea. However, elaborate team information processing would be needed to optimally benefit from the pooled resources of the group. The MIP-G model delineates under what conditions groups members are able to successfully share and integrate their knowledge and insights.

On the basis of the MIP-G model as a conceptual framework for idea selection, a first prediction is that high epistemic motivation in the group should be a highly favorable condition for idea selection in groups. Epistemic motivation drives group members to process and integrate all information more deeply and to show more constructive behavior (De Dreu, Beersma, Stroebe & Euwema, 2006; De Dreu et al., 2008). When a group engages in an idea selection task, it will be more likely to successfully determine and identify the creativity of the generated ideas when the group integrates all information more thoroughly. However, we do not advance a main effects hypothesis as the tenets of the MIP-G framework propose that epistemic motivation alone is not sufficient. Successfully identifying the creativity of ideas does not necessarily mean the group will also select those ideas. According to the MIP-G model, social motivation also plays a crucial role in negotiating and group decision making. Thus, as the MIP-G framework guiding our study predicts an interplay between epistemic and social motivation, we refrained from making main effect hypotheses.

When it comes to social motivation, group members may not only be motivated to select the best alternative for the group, but they may also be motivated by personal interest (Nijstad & De Dreu, 2012). For example, group members could have a personal interest to get

their own idea selected, in order to take credit for it, even if their idea is not necessarily the most creative. Other participants may be interested in avoiding uncertainty and want the group to select an idea that is highly feasible and not very novel, although that might not be the optimal group outcome (e.g. Mueller, Melwani & Goncalo, 2012). When participants are preoccupied with such personal interests, it might lead them to engage in strategies where information is strategically withheld to increase the chances for their preferred personal outcome. According to MIP-G, prosocial motivation stimulates open information exchange during group decisions (e.g. Steinel, Uitz & Koning, 2010), and increases the chances of favorable group outcomes in an integrative negotiation context (De Dreu et al., 2006). Tjosvold (1998) suggested that cooperative goals are fundamental to positive conflicts, whereas competitive goals interfere with productive conflict. Stimulating prosocial motivation would lead a group to adopt cooperative goals, whereas stimulating proself motivation would lead a group to adopt competitive goals. Moreover Bechtoldt et al. (2010) hypothesized that prosocial groups would create a psychologically safe group climate, which causes less fear of person-oriented criticism, and would therefore cause group members to engage in more constructive debate. We argue that, under high epistemic motivation, prosocial motivation will help groups to overcome the social-political barriers in idea selection and will stimulate groups to select more creative ideas than proself motivated groups. Groups that show both high epistemic motivation and prosocial motivation will not only be able to identify the most creative ideas, but will also actually select them.

***Hypothesis 1:** For groups under high epistemic motivation, a prosocial motivation will lead to selection of more creative ideas than a proself motivation.*

Method

Design and participants

Two hundred and forty participants were recruited. All participants were working employees (mean age = 40 years; 133 female). Employees were Dutch-speaking and worked at 19 different organizations in The Netherlands and in Belgium and had at least two years working experience. Among the cooperating organizations were consultancy companies, a game developing company, an NGO, education institutes, a bank, a police academy, government institutions, a door and window production company and an entrepreneurial network group. Within each organization, subjects were randomly assigned to three-person groups. Each group was then randomly assigned to one of four conditions. As all conditions were each time administered in each organization with random group assignment to conditions and random assignment to groups, this design aimed at ensuring that experimental conditions were not nested in organizations. An a priori power analysis for our central hypothesis was conducted. We ran the power analysis based on a 2x2 ANOVA to estimate the sample needed to attain statistical power of .80 ($\alpha = .05$) to detect an effect size of (f^2) of 0.35, on the basis of the effect size reported in Bechtoldt et al. (2010). The results indicated a minimal sample size of 66 three-person groups. However, because the present experiment was conducted in field conditions (in contrast to Bechtoldt et al.'s controlled lab setting), we anticipated more 'noise' during data collection (e.g. uncontrollable external factors) and therefore, determined an optimal sample size of 80 three-person groups or 20 groups per condition. We used a 2 (low vs. high epistemic motivation) X 2 (proself vs. prosocial motivation) between groups design with analysis at the group level. Our central hypothesis aimed at measuring creativity as the focal dependent variable. However, on the basis of the results observed, we conducted additional exploratory analyses to examine the pattern of results obtained for originality and feasibility as dependent variables.

Procedure

As involving real organizations in this type of in situ experiments was not straightforward, they were recruited over a course of 18 months through the network of a commercial creativity consultancy bureau. In order to compare groups of three participants over the four experimental conditions, the experiment required at least 12 participants. However, large teams of at least 12 members being present for participation in an experiment proved rather difficult to identify. Therefore, we did not recruit existing work teams but individual participants at the department level of the organization. All participating employees enlisted voluntarily for a creativity workshop in their organization. In return for participating in the experiment, they would receive a workshop on creativity and innovation. As participants took part in the experiment in their role as employees in the organization and as they brainstormed about their own job with their own colleagues, this setting provided an ideal opportunity to test our hypothesis. The number of enlistments for each session was limited to 12 participants. Upon arrival the participants were introduced to the experiment, which consisted of two main parts, an idea generation task and an idea selection task. First, they were instructed to generate as many ideas as possible with the 12 participants together. They were asked to think of ideas on how to stimulate creativity in their daily work for 20 minutes (see Rietzschel et al., 2006). After generating ideas, all participants were given a filler task to give the researchers time to print out the list with the generated ideas. After the filler task, each participant was randomly assigned to a three-person group in one of the four experimental conditions. Thus, in each participating organization, all four experimental conditions were administered with random assignment of participants and groups, so our manipulations were not nested within organizations. Within one organization, each condition consisted of three participants and each participant received a list of the generated ideas on paper. They were then placed in separate locations in order not to disturb each other. Each group was then asked to select only one idea out of the pool of generated ideas, which they

found the most creative. They received no further instructions about what ‘creative’ meant. Prior to idea selection, each group received different instructions; this was where the manipulations of social and epistemic motivation took place.

Social motivation. As identified by De Dreu et al. (2008), prosocial motivation is triggered by third party instructions to cooperate (see also Nijstad & De Dreu, 2012). Similar to Beersma and De Dreu (2005), participants in the prosocial motivation condition were told that groups are more successful when its members work together as a group, take each other standpoints seriously and strive towards a shared vision. Participants in the proself motivation condition were told that groups are more successful when group members keep to their standpoint and try to convince the other members of their point of view. The groups in each condition were then instructed to apply the given strategy during the idea selection and they received a written version of the instructions.

Epistemic motivation. In order to manipulate epistemic motivation, we used a time pressure intervention. De Dreu, Nijstad, Bechtoldt and Baas (2011) suggested that time pressure increases peoples need for quick solutions and thus decreases their epistemic motivation to engage in deliberate thinking. Indeed, time pressure has been successfully used as a manipulation of epistemic motivation in earlier research (Bechtoldt et al. 2010; De Dreu, 2003; De Grada et al., 1999; Kruglanski & Freund, 1983). Groups in the low epistemic motivation condition were told that they only had five minutes to come up with their selection of the most creative idea. A timer was visibly placed on their table to increase pressure. Groups in the high epistemic motivation condition were told that they had more than sufficient time to come up with their selection.

Measures

In accordance with Amabile's (1982) Consensual Assessment Technique, ideas generated were rated by independent judges with extensive domain-relevant expertise. Thus,

ideas were rated by professional consultants who had at least five years of experience as creativity consultants and were professionally hired for stimulating creativity at different companies. Similar to previous research, a creative idea was defined as an idea that is both novel and useful (Amabile, 1996). The experts rated each idea on overall creativity as the focal dependent variable, using a 5-point Likert scale. From an exploratory perspective, we also asked them to rate originality and feasibility. To calculate the inter-rater reliability, we computed the intra class correlation for the experts for creativity ($ICC[3, 3] = .50$), originality ($ICC[3, 3] = .75$) and feasibility ($ICC[3, 3] = .63$) (see for instance, Prabhakaran, Green & Gray, 2014, for similar inter-rater reliabilities for originality). Although these inter-rater reliabilities for creativity and feasibility are relatively low, they are considered acceptable (for creativity), good (for feasibility) and excellent (for originality) levels according to Cicchetti and Sparrow (1981). A possible reason for these relatively low inter-rater reliabilities might be our strict application of Amabile's CAT technique. Instead of working with trained research assistants, we worked with three field experts, without training them or giving them specific instructions on the scoring of the ideas. The average scores were then used as our dependent measures.

In order to assess whether the groups were epistemically and prosocially motivated during the task, we asked participants to what extent they thought deeply before making a decision and to what extent they were motivated to have a positive impact on the other group members on a 1 = "not at all" to 5 = "very much" scale.

Results

Manipulation checks. Participants in the high epistemic motivation condition ($M = 3.05$, $SD = 1.06$) reported to think deeper before making a decision ($M = 2.61$, $SD = 1.06$; $F(1, 238) = 10.38$, $p = .001$, $\eta^2 = .042$). Participants in the prosocial condition ($M = 3.78$, $SD = 0.85$) tended to report more motivation to have a positive impact on the other group

members than participants in the prosself condition ($M = 3.53$, $SD = 0.91$; $F(1, 238) = 3.65$, $p = .057$, $\eta^2 = .015$). However, the difference was only marginally significant. To check the robustness of our findings, we also ran our analyses while controlling for industry to which each of the companies belonged. Our results showed that industry did not affect the results. We also examined whether organizations differed on cultural collectivism, but found no differences across organizations. We additionally performed a robustness check by controlling for cultural collectivism at the organization-level, team-level and including potential interactions with experimental manipulations. Cultural collectivism did not affect the results.

Outliers. For our analysis we assumed that people engaged in behavior that follows a normal distribution. However, as we had no complete control over the surroundings wherein the experiment took place in each company (e.g., noise, meeting tables, potential distraction), which is inherent to conducting experiments in a field setting, we first checked the dataset for outliers. Cook's Distance was used to determine any outliers that could influence the outcome of further analysis. The results revealed that two 3-person teams exceeded the cut-off point on all three dependent variables. On the basis of these results we decided to drop those two teams from further analysis. We acknowledge that it is generally recommended (Aguinis et al., 2018) to determine the causes for unusual response patterns in detail before removing outliers. However, given the nature of the sample and field study, we did not have more detailed information available to further examine these outliers. Note that analyses for the entire sample yielded the same pattern of results, but the focal interaction effect became marginally significant.¹

¹ In order to be fully transparent, we also report the results with outliers included. With the outliers included we found a marginally significant interaction effect for creativity, $F(1, 76) = 3.01$, $p = .087$, and a marginally significant main effect for originality, $F(1, 76) = 3.86$, $p = .053$. For feasibility no significant effects were found.

Insert Table 1 about here

Creativity. A 2 (low vs. high epistemic motivation) X 2 (proself vs. prosocial motivation) ANOVA was used to test our main hypothesis. Results are plotted in Figure 1. ANOVA analysis showed a significant interaction effect $F(1, 74) = 6.74, p = .011, \eta^2 = .08$. Planned comparison comparing the high epistemic groups in the prosocial condition ($M = 2.62, SD = 0.70$) and the proself condition ($M = 3.21, SD = 0.63$) revealed a significant difference $F(1, 74) = 7.45, p = .008^2$. Thus, instead of prosocial groups outperforming the proself groups under high epistemic motivation, our results show the opposite of our prediction. Therefore, the results do not support Hypothesis 1 and thus, our prediction guided by the MIP-G model that high epistemic and prosocial motivated groups would select more creative ideas than proself groups was not supported. As a follow-up to our main hypothesis, we also separately explored differences in idea selection between groups for originality and feasibility as dependent variables.

Originality. We conducted the same 2 (low vs. high epistemic motivation) X 2 (proself vs. prosocial motivation) ANOVA, for the originality ratings. The ANOVA showed a significant main effect for prosocial motivation, $F(1, 74) = 4.53, p = .037, \eta^2 = .06$. To test our hypothesis with originality as dependent variable, we conducted planned comparisons comparing the high epistemic groups. Results are plotted in Figure 2. Groups in the high epistemic and prosocial condition ($M = 2.70, SD = 0.87$), selected ideas that were

² We also ran the analysis controlling for cultural collectivism, need for cognition, experience with creativity and education level. The results yielded the same significant interaction effects for creativity $F(1, 70) = 4.74, p = .032$ and originality $F(1, 70) = 6.17, p = .015$. No significant effects were found for feasibility.

significantly less original than groups in the high epistemic and proself condition ($M = 3.46$, $SD = .85$; $F(1, 74) = 7.80$, $p = .007$).

Feasibility. A 2 (low vs. high epistemic motivation) X 2 (proself vs. prosocial motivation) ANOVA with feasibility did not show a significant interaction effect $F(1, 74) = .96$, $p = .34$. Consequently, we did not conduct a planned comparison for feasibility.

However, in order to provide full disclosure on all our results we also depicted the outcomes for feasibility in Figure 3.

Insert Figure 1, Figure 2 and Figure 3 about here

Discussion

Pre-implementation activities like idea selection play a crucial role in the innovation process (Potočnik & Anderson, 2016). Since long, research on new product development has pointed to idea screening as one of the most challenging tasks for senior management (e.g., Baker, & Albaum, 1986). Using the well-established MIP-G model as a framework for idea selection, we argued that motivated information-processing in groups may provide a new lens to better understand the underlying dynamics of how idea selection groups decide on what creative idea to select for further development. More specifically, we hypothesized that under high epistemic motivation, prosocial motivated groups would select more creative ideas than proself motivated groups. We reasoned that epistemic motivation would be needed for a group to successfully determine the creativity of ideas, but that epistemic motivation must be combined with prosocial motivation for the group to also select those creative ideas.

Surprisingly, the results did not support our hypothesis. Instead, under high epistemic motivation, prosocial groups selected significantly less creative ideas, compared to proself groups. However, because of the significant interaction effect, caution is needed in interpreting main effects. Follow-up analyses for originality as dependent variable showed a similar pattern of results. A prosocial motivation led to less original idea selection as compared to a proself motivation. Interestingly, a prosocial motivation did not have a significant effect on feasibility of ideas. Thus, contrary to our predictions, under high epistemic motivation proself motivation stimulates the selection of more original and creative ideas, without giving in on feasibility. These findings challenge predictions of the MIP-G framework in the context of idea selection. Importantly, this does not necessarily mean that our results disconfirm the MIP-G prediction. Possibly the underlying mechanisms proposed by the MIP-G model are still at play, but the nature of the context or task in this research may lead to different effects.

Although caution is needed given the potential noise in our design and measures, we believe this is an important contribution of the current study. Our empirical results are not in line with key predictions of the well-established MIP-G framework, which suggests that theoretical refinement might be needed. In light of the reproducibility challenge in psychological science (Open Science Collaboration, 2015), we believe that solid experimental tests of well-established theories in new, field samples are the way forward to increase our theoretical understanding of creativity and innovation (see also Anderson et al., 2014). Our unexpected results indicate the value of such systematic tests and demonstrate how they are an important strategy not only for the creativity domain, but also for the innovation and entrepreneurial domain to come to further development of existing theories. To this end, we provide three potential explanations for our results that may guide future research in further refining the MIP-G model and its boundary conditions in the context of idea selection.

A priori levels of prosocial motivation

First, the effect of manipulating social motivation on group performance might depend on a priori levels of prosocial motivation in the group. For example, Tjosvold (1998) proposed that competitive conflict within a general cooperative context may be more constructive, especially during conflicts such as debating who has the best idea. One implication may be that when a group has to perform a task in a prosocial context, inducing a proself motivation might lead to more constructive controversy, and consequentially to better outcomes. Contrary to students in laboratory settings, the employees in our study actually worked together in the same company and thus anticipated future interaction. Students who participate in lab experiments rarely anticipate any future cooperation. Anticipated future interaction and past cooperation have been advanced as interventions that may increase prosocial motivation (De Dreu et al., 2008). It might be that, when a group of colleagues has to work together, their prosocial motivation is already high due to anticipated future interaction. Also, Bechtoldt et al. (2010) hypothesized that prosocial groups would create a psychological safe and positive group climate, which causes less fear for person-oriented criticism so that they should engage in more constructive controversy. Our explorative analyses of the manipulation checks suggested no significant difference in psychological safety between the proself or the prosocial conditions, which would be in line with a more general, pre-existing prosocial context (e.g. colleagues in a work environment that anticipate future interaction). Maybe, when groups are already high in prosocial motivation, constructive controversy is better served by proself than prosocial motivation. High prosocial groups stimulated to be even more prosocial, might become too agreeable. In their qualitative research Caniëls, De Stobbeleir & De Clippeleer (2014) conducted in depth interviews with knowledge workers and professional creatives. The respondents reported that group

discussions regarding idea quality are always valuable, as long as they provide a challenging perspective. They stressed that: "...feedback should always be well-founded, based on numerous arguments and never formulated as an attack." This finding is in line with the idea that a certain amount of prosocial motivation is needed in order to get the group to work as a team, but when an optimal level of prosocial motivation is attained, proself motivation might be needed to elicit constructive controversy. Interestingly this line of reasoning is supported by earlier research. Badke-Schaub, Goldschmidt & Meijer (2010) used student teams working on a design task. These student teams were real teams in the sense that they had to work together on a real assignment for several months. In other words, they anticipated future interaction, which might have evoked higher a priori levels of prosocial motivation. The results revealed that teams that showed more competitive and compromising conflict behavior during the team process, produced significantly more innovative designs than teams that showed a more collaborative conflict style. The authors concluded: "This result is in contradiction with the explanations of De Dreu (2006) who sees collaboration as the most important and contributory group behaviour towards arrival at an innovative result in situations of cognitive task conflict." The subtle balance between prosocial and proself motivation is supported by the work of Eisenhardt (2013). Her work on the performance of top management teams indicated that the most effective top management teams make rapid choices, have very intense conflict about these choices and still maintain cordial relationships. Additionally, her work on simple 'selection' heuristics (Eisenhardt, 2013) might provide an interesting avenue for future research to improve decision making during creative idea selection.

Taken together, future research may want to test a priori levels of prosocial motivation and determine whether optimal combinations of prosocial and proself motivation exist.

Idea selection as a judgement task

Second, the characteristics of an idea selection task may differ from more traditional group decision tasks, which could allow for other motivational dynamics. This line of reasoning is supported by the research of Stasser and Steward (1992), who gave participants a murder mystery task. One group was led to believe that the detectives involved had insufficient evidence to charge anybody. This group was labeled the judgment group, because they had to judge which suspect was more likely to be guilty. The other group was told that only one suspect could have committed the crime and a decision had to be made about which suspect was guilty. This group was labeled the solve group, because they believed there was only one possible solution. Their results showed that the anticipation of sufficient information led to more information sharing and processing. The authors suggest that when group members believe that a demonstrably correct answer exists, discussion may be more data driven and less consensus driven. An idea selection task shares more characteristics with a judgment task than a solving task. Therefore, the characteristics of an idea selection task are likely to stimulate consensus-seeking behavior in a group, at the cost of sharing and processing all available information. In this context, stimulating prosocial motivation makes sense when a group has to solve a typical decision-making task. But stimulating prosocial motivation during an idea selection may actually increase consensus seeking behavior, rather than constructive controversy. Moreover, an idea selection task may also share some characteristics with a creativity task. Research showed that an idea generation task benefits from openness to experience and a specific goal for creativity (George & Zhou, 2001; Shalley, 1991). Possibly, an idea selection would also benefit from openness and a goal for creativity. In support of this suggestion, Caroff and Besançon (2008) found that judges who

are original themselves also took originality more into account when evaluating creative ideas.

Creativity bias and social tuning

Third, our diverging results may be explained by a ‘creativity bias’ in selecting ideas. Rietzschel et al. (2010) found a strong tendency of participants to select feasible and desirable ideas at the cost of originality. These findings suggest that people do not take originality into account when selecting creative ideas. Additionally, Mueller, Melwani and Goncalo (2012) showed that when people experience uncertainty, they implicitly show a negative bias against creativity. Under uncertainty, people were less able to recognize creative ideas. Idea selection might be seen as a highly uncertain context, as the goal is to try and predict which idea might appear to be a successful solution in the future to a current problem. If an implicit creativity bias is at play, it seems plausible that participants in prosocial groups will be particularly motivated to avoid creative and original ideas. Lunn, Sinclair, Whitchurch and Glenn (2007) described this effect as the epistemic social tuning hypothesis. In a series of studies Bechtoldt et al. (2010) showed that implicit group norms indeed influenced the outcome of creativity tasks. When the group norm was to be original, prosocial groups under high epistemic motivation generated more original ideas. When the group norm was to be appropriate, prosocial groups produced more appropriate ideas. This line of reasoning is supported by the more recent model put forward by Denrell & Le Mens (2017). Their model builds on extensive previous work on belief adjustments. This line of research has shown that people tend to process information on popular alternatives systematically different from how they process information about unpopular alternatives (e.g. Bem, 1972; Festinger, 1957; Denrell, 2005). The model explains the mechanism behind collective illusion development during group decision making. The authors state that merely being exposed to a more popular

alternative in a group, will already stimulate information sampling in favor of that alternative. When feasible ideas are more popular in a group through creativity bias and social tuning, it might also inadvertently stimulate the information processing of the popular, feasible alternatives. This in turn might create a collective illusion of choosing the superior option in that group, even if it is the suboptimal alternative. That might explain why all our participants indicated they believed their chosen idea would be actually successful if it was implemented (on a 5-point scale $M = 4.23$, $SD = 0.97$). Thus, future research might want to examine how implicit group norms and implicit bias against creativity affect idea selection in groups and how they develop under influence of situational factors (e.g. uncertainty, prior experience, creative self-efficacy).

Managerial Implications

During the pre-implementation stages of an innovation process, management teams often have to screen a multitude of ideas and evaluate their potential for innovation success, with the end-goal of deciding on which idea to further develop. Recent studies indicate that group decisions do not automatically select the creative ideas. In contrast, the studies suggest that feasible ideas are preferred at the cost of their originality (Mueller, et al., 2012). This is especially problematic when organizations want to pursue radical innovations. Although more research is needed, our results might provide a framework to get a better understanding of the underlying mechanisms that determine the screening and selection quality of an organizational team. Instead of emphasizing collaboration during idea selection, a team might come to a more creative result when they emphasize constructive discussion. For instance, instead of asking the group to decide which idea the group believes is the best idea, one might stimulate discussion by asking them first to individually select their favorite idea and then have a group discussion about the individually selected ideas.

Limitations

Naturally studies in a field setting bring along some logistic and practical problems. On the one hand, due to the field conditions, we were not able to control for all environmental factors (e.g. time of the day, light, noise and location). However, we did go out of our way to ensure equal treatment over conditions and organizations (e.g., randomization of timing and participants per condition). A second limitation is that even though we randomized all participants over the experimental conditions, we did not measure individual differences like general intelligence or social value orientation that might have impacted team performance. However, we did measure cultural collectivism and need for cognition, individual differences that might impact epistemic and prosocial as proposed by De Dreu et al. (2008). As Footnote 2 in the result section shows, the analysis controlling for these individual differences yielded the same significant interaction effects. Another limitation may be that all participants volunteered to the experiment. This may have stimulated a positive bias towards creativity. However, note that all participants were randomly assigned to one of four experimental conditions. A further limitation may be that the selected ideas did not need to be implemented after the experiment. It might be that participants would have chosen different ideas (e.g. more feasible ideas) if they had to actually implement the chosen ideas. However, participants indicated they believed their chosen idea would be actually successful if it was implemented (on a 5-point scale $M = 4.23$, $SD = 0.97$), suggesting that their choices reflected reality relatively well. Finally, whereas we observed significant effects for prosocial motivation in our results, our manipulation check for prosocial motivation was only marginally significant. Although the manipulation we used has been successfully applied in earlier lab research (e.g. Beersma & De Dreu, 2005), future research in the field might consider to use alternative manipulations that may potentially yield stronger effects. For example, Pavey, Grietmeyer &

Sparks (2014) showed that a priming task highlighting relatedness or autonomy significantly impacts prosocial motivation and behavior.

Conclusions

Since long, researchers have identified idea screening decisions as one of the most challenging but also most impactful phases of the product innovation process. When successful idea sourcing is followed by flawed idea screening this undermines the potential success of the entire innovation process. We argue that a better understanding of the underlying motivations for information-processing may inspire new strategies for idea selection groups. To this end, we turned to the Motivated Information Processing in Groups model predicting that prosocial groups under high epistemic motivation should outperform proself groups under high epistemic motivation on complex group tasks. Surprisingly, our results suggest that under conditions of high epistemic motivation, proself motivated groups selected significantly more creative and original ideas than prosocial groups. On the basis of these first results, a recommendation for idea screening committees in organizations might be to promote team members to defend one's own point of view and elicit constructive controversy (i.c. proself motivation).

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	Low EM x Proself (N= 20)	Low EM X Prosocial (N=19)	High EM X Proself (N=19)	High EM X Prosocial (N=20)
Creativity Mean	2.90	3.11	3.21	2.62
Creativity SD	.77	.59	.63	.70
Originality Mean	3.21	3.16	3.46	2.7
Originality SD	.85	.80	.85	.87
Feasibility Mean	3.12	3.44	3.25	3.18
Feasibility SD	.86	.57	.98	1.02

Table 1 : Descriptives of creativity, originality and feasibility ratings in each experimental condition. EM = epistemic motivation.

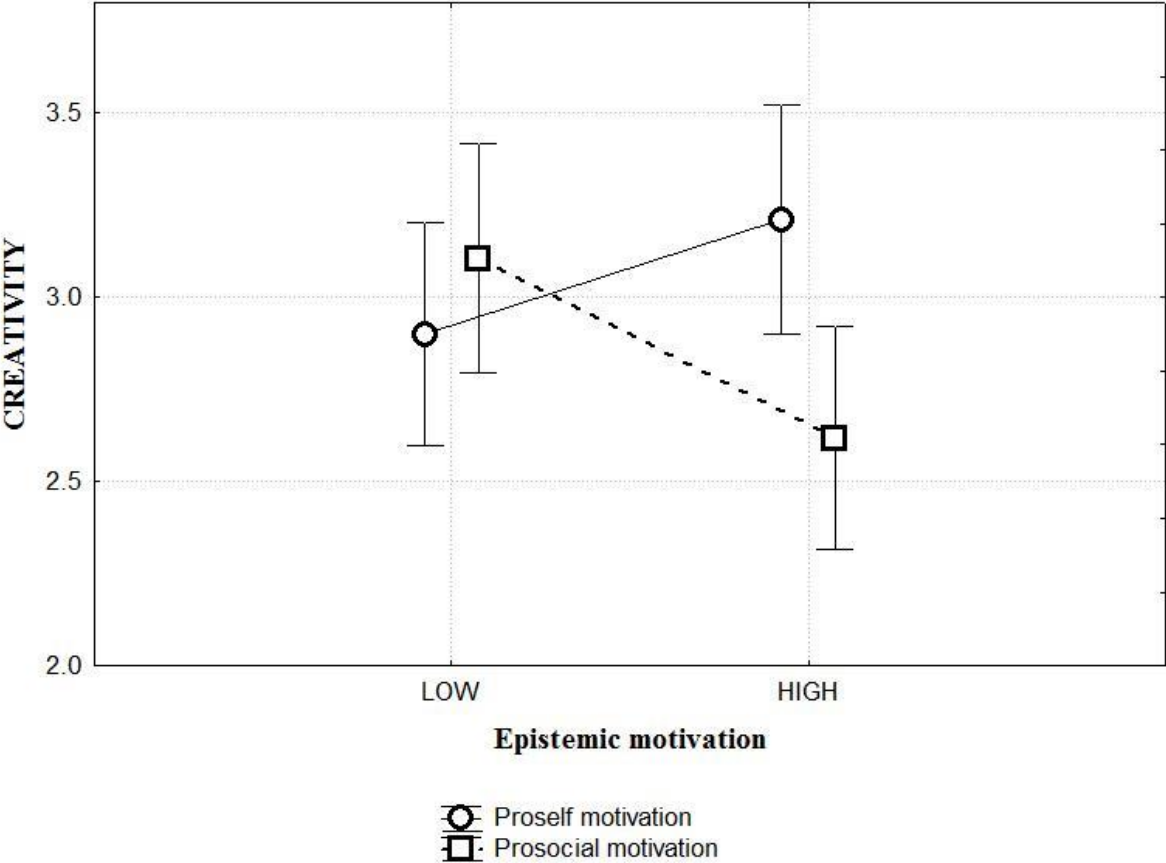


Figure 1: Creativity scores of the selected ideas by proself and prosocial motivated groups in low and high epistemic motivation condition. Vertical bars denote 0.95 confidence intervals.

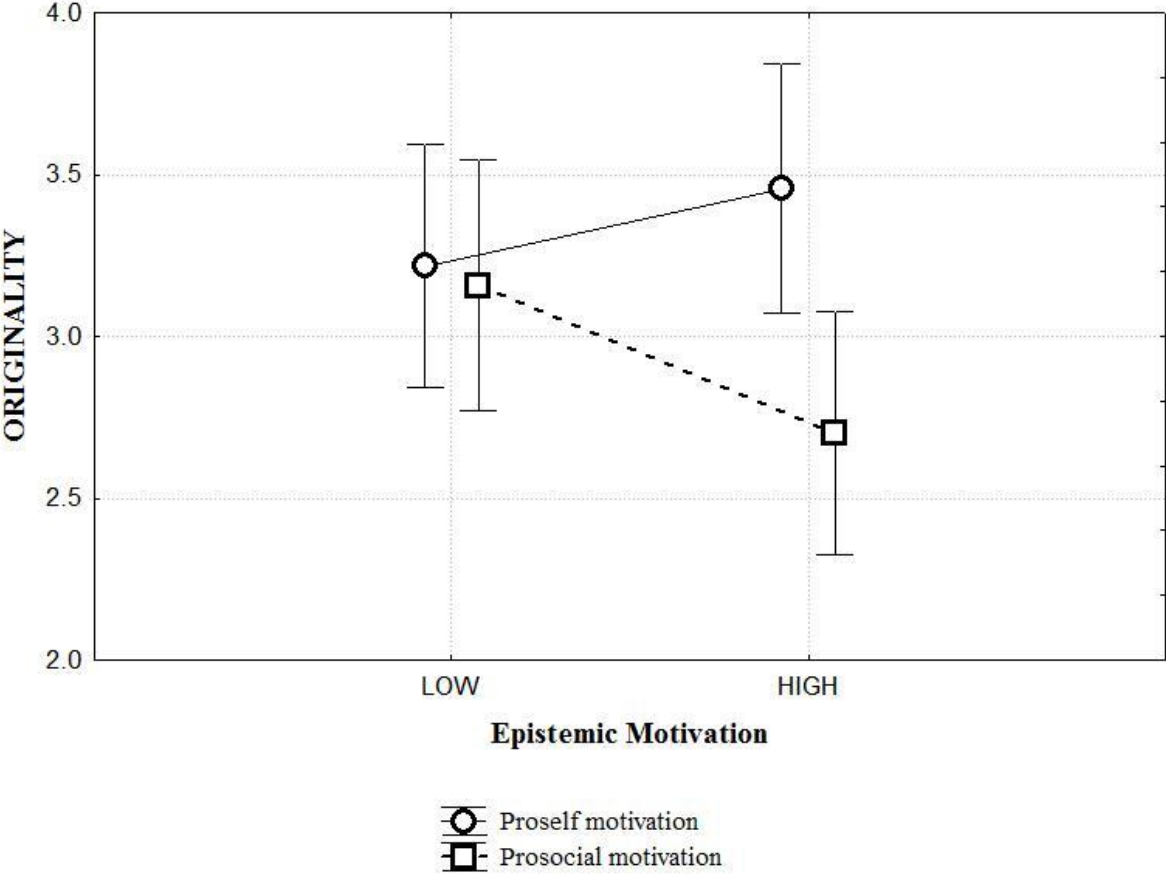


Figure 2: Originality scores of the selected ideas by proself and prosocial motivated groups in low and high epistemic motivation condition. Vertical bars denote 0.95 confidence intervals.

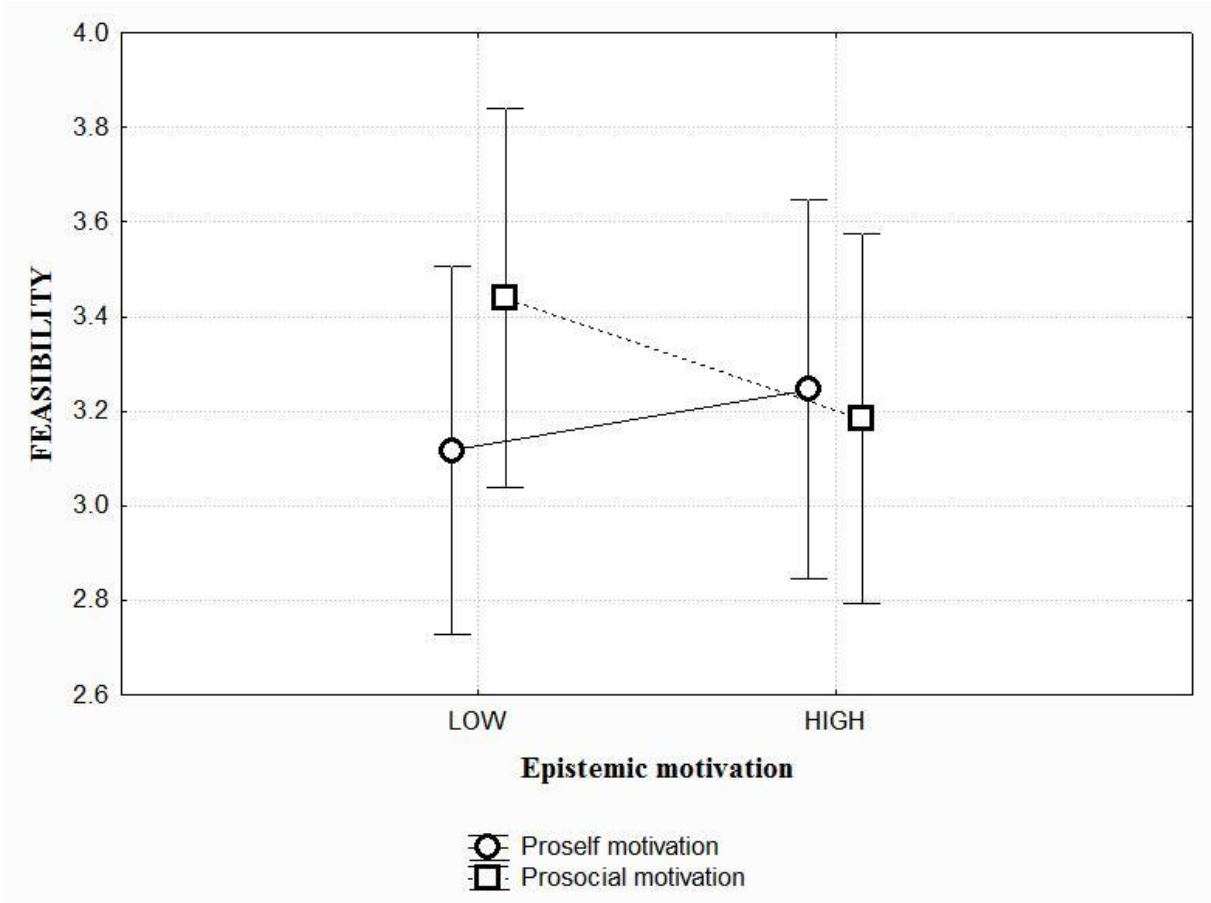


Figure 3: Feasibility scores of the selected ideas by proself and prosocial motivated groups in low and high epistemic motivation condition. Vertical bars denote 0.95 confidence intervals.