

RUNNING HEAD: CLOSENESS, PERSPECTIVE TAKING, GROUP CREATIVITY

Creativity through connectedness: The Role of Closeness and Perspective Taking in Group  
Creativity

## Abstract

Achievements in various fields of creativity are more and more coming from collaborative teams. In this research we investigated the role of interpersonal process variables, namely closeness and perspective taking in group creativity with a two by two experimental design. Sixty-one three person groups assigned to four conditions (1-closeness and perspective taking, 2- perspective taking, 3-no closeness and no perspective taking, 4-closeness). Group members collaboratively wrote stories that were rated by three independent expert judges. There was a positive main effect of closeness and negative main effect of perspective taking on group creativity scores. Moreover, the significant interaction between perspective taking and closeness displayed that combination of closeness with perspective taking negatively affect group creativity. These results indicate that closeness might be beneficial for group creativity only when it is not accompanied with perspective taking.

*Keywords:* Creativity, group creativity, closeness, self-disclosure, perspective taking, collaborative story writing

A recent report by multinational professional services firm Deloitte published the results of a survey conducted with more than 7000 executives in more than 130 countries. It suggested that the demand for and popularity of teamwork has reached its peak point. Almost half of the executives surveyed reported that they are either putting more emphasis on team work or are initiating it among their workforce (Ryder, 2016).

Creativity is often defined as the generation of novel and useful ideas, solutions, or insights (Amabile, 1996; Runco, 2004). Theories of group creativity are mostly inspired by input-process-output (IPO) models developed in the team work literature (West & Anderson, 1996) which regard the task, the composition of the group (e.g., diversity, size, longevity), and the organizational context as the main inputs, and the number of innovations and innovation quality as the main output. Group processes (e.g., psychological safety, task orientation, cohesion) connect group inputs and outputs (West, 2002). According to Hulsheger, Anderson and Salgado's (2009) meta-analysis, such group process variables play a key role in group creativity. However, previous studies mainly focused on factors differentiating individual creativity from group creativity and how the characteristics of the group or task, (i.e., "inputs" in IPO models) influence group creativity (Bechtoldt, De Dreu, Nijstad & Choi, 2010). Hence, there is still rather little understanding about the processes through which group collaborations result in creativity.

Conceiving groups as information processors, De Dreu, Nijstad, and Van Knippenberg's (2008) theory of motivated information processing in groups (MIP-G) integrated cognitive and motivational aspects of group decision making and group creativity (Bechtoldt et al., 2010). Specifically, the MIP-G theory postulated that individuals' group information processing are driven by either epistemic or social motivation. Epistemic motivation is defined as the individual's "willingness 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, p. 23). The higher epistemic motivation, the more group members care about acquiring rich and accurate information. Social motivation reflects individuals’ preferences towards distribution of outcomes as either proself (i.e., interest in one’s own outcomes) or prosocial (i.e., interest in collective outcomes). While epistemic and social motivations serve different functions, the right combination of these motivations (e.g., a group high in prosocial and epistemic motivation) may facilitate groups’ effective information processing and eventually contribute to high quality outcomes (Bechtoldt et al., 2010; De Dreu et al., 2008). In the current research, closeness is defined as a social motivation source whereas perspective taking is seen as an epistemic motivation source and the role of these variables in group creativity were investigated.

### **Closeness and Group Creativity**

How people think, feel and relate to each other is arguably important in any group interaction. However, the role of interpersonal bonds for group creativity is still debated in the literature. For example, cohesion, one of the most researched variables in group creativity, has on the one hand been found to create a psychologically safe and motivating environment for group members to take more risks and eventually be more innovative (Craig & Kelly, 1999; Hulsheger et al., 2009; Mullen & Copper, 1994; West & Wallace, 1991). On the other hand, Staw (2009) argued that although groups need cohesion for group formation, it can lead to a sense of homogeneity which might harm the creativity of group. To contribute to the understanding of debated position of interpersonal processes in group creativity, the present study experimentally investigated the role of closeness.

Successful exchange of information is often driven by perceived reciprocal attractiveness of communication partners (Ziebro & Northcraft, 2009), which can be achieved by increasing the level of psychological closeness. The current research defined closeness as the perceived connectedness or interconnectedness of self and other (Aron, Aron & Smollan,

1992; Aron, Melinat, Aron, Vallone & Bator, 1997; Seidikides, Campbell, Reader & Elliot, 1999). Such closeness can be established through self-disclosure, that is the willingness to disclose (private) information to others and opening up to another person or a group (Aron et al., 1997; Cozby, 1972). In empirical research, increased self-disclosure was associated with decreased interpersonal distance in groups (Bunch, Lund & Wiggins, 1983) and increased group cohesiveness (Kirshner, Dies & Brown, 1978). Furthermore, task-based self-disclosure in groups (i.e., exchange of information concerning facts and feelings towards the task) increased group cohesiveness, members' commitment to the task as well as group productivity (Elias, Johnson, & Fortman, 1989). Thus, increasing closeness through self-disclosure can foster social coordination and social bonds. However, as of now, whether and how closeness affects group creativity has not been investigated yet. In line with MIP-G theory, groups formed of members who feel more close to one another (i.e., group members who report an increased self-other overlap) were proposed to produce more creative outputs than those groups whose members feel more distant to one another.

### **Perspective-Taking and Group Creativity**

Perspective taking, trying to understand “the thoughts, motives, and/or feelings of a target, as well as why they think and/or feel the way they do” (Parker, Atkins, & Axtell, 2008, p. 151), is an important social skill for social coordination and interaction (Davis, 1983; Piaget, 1932). Grant and Berry (2011) found that perspective taking mediated the relation between prosocial motivation and individual level creativity: While intrinsic motivation was related to the novelty aspect of individual creativity, perspective taking was more likely to drive the usefulness of individual creative outputs. In addition, several studies demonstrated the positive role of perspective taking for group processes and outcomes (see Ku, Wang & Galinsky, 2015, for a review). For instance, recognizing group members' viewpoints and ideas increased group problem solving (Taggar, 2002), was associated with greater

cooperation, better communication, more trust, and satisfaction (Falk & Johnson, 1977), facilitated a supportive team environment (Wolff, Pescosolido, & Druskat, 2002) and decreased prejudice and stereotyping through forming social bonds (Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000).

Perspective taking can also be a key process in group creativity as it motivates members to be receptive to diverse perspectives which, in turn, can enhance the chance of developing novel and useful ideas (Perry-Smith & Shally, 2003; Perry-Smith, 2006). Thus, following MPI-G, perspective taking can be a source of epistemic motivation (De Dreu & Carnevale, 2003), which allows groups to expand their knowledge base (Csikszentmihalyi & Sawyer, 1995). Indeed, Hoever, Knippenberg, Ginkel and Barkema (2012) found that the effect of a team's diversity (i.e., differences in members' perspectives about a task) on creativity was moderated by group members' level of perspective taking. In their experiment, three-person teams were developing a creative plan to improve a hypothetical theatre. Diverse teams generated more creative plans only when they were required to take others' perspectives. The effect of perspective taking on creativity was driven by increased information elaboration within the groups.

It is still an open question as to whether perspective taking is beneficial for all creative groups (i.e., non-diverse groups) and whether it also has a direct effect on group creativity (Ku et al., 2015). This study investigated whether perspective taking directly affected group creativity by itself and in combination with closeness. On the basis of research pointing to various benefits of perspective taking for group processes and outcomes (Falk & Johnson, 1977; Ku et al., 2015; Wolff, et al., 2002) groups formed by members with higher perspective taking were expected to produce more creative outcomes.

## **Closeness and Perspective Taking in Group Creativity**

Some research conceptualizes perspective taking and cognitive closeness as related constructs. Groups which are highly empathic, highly accepting, and displaying higher levels of self-disclosure tend to be more cohesive (Roark & Sharah, 1989). Increased cohesion might lead to group think which often inhibits divergence within the group and thus jeopardizes the creativity of groups (Janis, 1972; Jaussi & Dionne, 2003). Thus, from this point of view, perspective taking *and* closeness might lead to highly connected groups which are expected to arrive at less creative outputs. The current study allowed us to investigate these alternative hypotheses.

### **The current study**

The current research examined the role of the group process variables closeness and perspective taking for group creativity following the MIP-G (Bechtoldt et al., 2010). Specifically, self-disclosure was proposed to create closeness and liking in the group. This, in turn, should foster the social motivation of and cooperative interactions in groups. Perspective taking should increase groups' epistemic motivation in a group creativity context as it allows members to be more attentive to and process different ideas (De Dreu, Nijstad, Bechtoldt & Baas, 2011; Somech, 2006). Thus, closeness and perspective taking were expected to separately increase group creativity. However, concerning the combined effect of closeness and perspective taking, two alternative hypotheses were advanced. According to MIP-G model, a combination of high perspective taking and closeness could increase group creativity. Based on research on the negative effects of group cohesion, a combination of perspective taking and closeness should decrease group creativity.

### **Method**

#### **Participants**

One-hundred and eighty-three participants (80 females, 103 males;  $M_{Age} = 26.22$  years,  $SD = 4.74$ ; age range = 18 to 56 years) were assigned to 61 three-person groups. Most were from Germany and all of them were German-speakers. Students at universities in Berlin and were recruited through the collaborating institute's participant pool. None of them had a background in creative writing. All participants were compensated with 15 euros each with a chance to additionally win 20 euros each if their group's story was rated as the most creative (see below).

### **Design and Procedure**

The study received ethical approval from the institute's Human Ethics Committee. Each step of the study was conducted in German. The study employed a 2x2 between-subject design with perspective taking (perspective taking manipulation; no perspective taking manipulation) and closeness (closeness manipulation; no closeness manipulation) as between-subject factors. Groups were randomly assigned to four experimental conditions: (1) closeness and perspective taking (combined) condition ( $n=15$ ); (2) perspective taking condition ( $n=16$ ); (3) closeness condition ( $n = 15$ ); and (4) no manipulation (control) condition ( $n=15$ ). The combined condition groups received both closeness and perspective taking manipulations.

Upon arrival, three participants were seated at a round table at equal distance from each other so they could see and hear each other clearly. Before the experiment, they were informed about the ethical approval, anonymity of the data, and right to withdraw, and signed the consent form based on this information. All group interactions were video-taped.

**Experimental manipulations.** Before groups engaged in the creativity task, participants in the three experimental conditions received experimental manipulations. *Perspective taking* was manipulated following Hoever et al. (2012). Groups in the combined and perspective taking conditions were given written instructions that asked them to take all



other members' perspective as much as possible during the task. Specifically, they were invited to imagine themselves as if they were in the other participants' shoes. Instructions also included specific examples of perspective taking, such as trying to understand what was important to the other person and why the other person might respond in a particular way.

*Closeness* was manipulated through self-disclosure. Previous studies suggested that a temporary sense of closeness can be induced in strangers through the gradual escalation of self-disclosure (Aron et al., 1997; Collins & Miller, 1994; Fraley & Aron, 2004). The self-disclosure manipulation followed the Relationship Induction Self-disclosure Task (RCIT; Sedikides, Campbell, Reader & Elliot, 1999) which works on the principle that reciprocal disclosing and creates this type of self-disclosure in the laboratory. The RCIT consists of three lists of questions which become gradually more personal. It encourages participants to share the answers of these questions in a natural conversation-like way as much as possible. Groups who received closeness manipulations were asked to answer the questions that were adapted from Lists I and II of RCIT question list about their names, profession, work place or university, their hobbies, their likes and dislikes, expectations and fears for the future, etc.

After participants were briefed about the study task and signed the consent form, they were given instructions to briefly answer the questions that we adapted from RCIT in writing. Then each member exchanged his/her answers with the group member sitting to his/her right, and this was repeated again to enable all members to read each other's answers. Participants' written personal statements were destroyed immediately at the end of the session. Groups in the combined condition first received the closeness before the perspective-taking instructions.

**Experimental Task.** Most of the group creativity research has used brain storming tasks to measure groups' creative outputs (e.g., Mullen, Johnson, & Salas, 1991; Nijstad, Diehl & Stroebe, 2003; Paulus & Yang, 2000). Brainstorming is an additive task that primarily requires participants to produce divergent ideas and measures groups' fluency,

flexibility, originality, and elaboration (Paulus, 2000). However, not all definitions of creativity conceptualize it as equivalent to divergent thinking (Runco & Acar, 2012). Furthermore, brainstorming does not capture the dynamics of real life groups which are working on tasks that require more complex group coordination skills rather than simply exchanging novel ideas (Craig & Kelly, 1999).

Group creativity was assessed with a collaborative story-writing task, a method which has not been used in the adult group creativity literature. Collaborative story writing is not an additive task but requires groups to combine, elaborate, and implement ideas in a meaningful way in one single product. Collaborative story writing has high face validity as it shares some similarity to the creative performances in real life verbal and artistic creativity tasks (Hennessey & Amabile, 1988). The original story-telling task by Hennessey and Amabile (1988) was modified to make it more appropriate for adults and for evaluating groups instead of individual creativity. Participants were provided with nine Rory's story cubes which were to assist them in creating the stories. Each face of the cubes contained a different image of a simple object (e.g., flower, ball, hat) which could be used as a cue to create the stories. Groups were told to roll the cubes and integrate the object depicted on the side of the cube lying face-up into their story. They were not given any rules and were free to use the cubes in the most convenient way. For example, some groups preferred to roll all nine cubes at the same time, while others took turns in rolling them. Before they started the task, all groups were instructed to write the most original story.

All groups had 20 minutes in total to create the stories, including the time allocated to write the stories on the laptops provided to them. For further motivation, groups were promised extra monetary rewards. Twenty Euros would be given to each member of the group which created the most original story (based on experts' evaluation, see below). After creating and writing-up their stories, all participants were given questionnaires on perspective

taking and inclusion of self in the group. At the end of the experiment, participants were debriefed, paid, and thanked.

## Measures

**Perspective Taking Manipulation Check.** Participants were asked to indicate their degree of perspective-taking on four items adapted from the perspective taking scale developed by Davis, Conklin, Smith and Luce (1996). Items included “I made an effort to see the world through the group members’ eyes,” “I imagined how the group members were feeling.” Participants answered these items on a 7 point Likert scale, from “Not at all” (1), to “Very much” (7). For each participant, an individual perspective-taking score was calculated consisting of the average of the four items ( $\alpha = .80$ ).

**Closeness Manipulation Check.** The “Inclusion of other in the self” (IOS) scale (Aron et al., 1992) is a well-used, validated, one-item interpersonal closeness scale. It is designed to measure overlap between self and other. Inclusion of the Ingroup in the Self Scale (IIS; Tropp & Wright, 2001) which was an adapted version of IOS scale for measuring the degree to which individuals include a specific ingroup in the self (see Aron et al., 1997) was used in the current research. The IIS asks participants to rate their interconnectedness between self and the group by picking one out of 7 representations of closeness depicted by two (overlapping) circles. One end of the scale corresponds to 1, “not at all close”, represented by the image of the two circles next to each other and not intersecting. The other end of the scale corresponds to 7, “very close”, depicted by the two circles overlapping almost completely. Between those two extremes, five images depict various degrees of closeness represented by the proportion of intersection between the two circles.

**Creativity Judgement.** Consensual assessment was used to assess the creativity of stories (Amabile, 1982). Four experts, who had a Master’s degree in German Literature and had experience in evaluating and writing stories, rated all 61 stories. A rating guideline was

prepared for raters based on the evaluation criteria adapted from Hennessey and Amabile (1988), Alhusaini, Maker and Deil-Amen (2014), and Pople (2014). Experts rated the stories on eight dimensions on a 10- point scale. Dimensions were presented with short definitions: Creativity (“using your own subjective definition of creativity, please rate the degree to which the story is creative”); Imagination (“rate the degree to which subject/plot is imaginative”); Novelty (“rate the degree to which subject/plot is novel”); Liking (“using your own subjective criteria, how well do you like the story?”); Emotionality (“rate the amount and depth of emotion the story conveys.”); Voice (“rate the level of use of voice in the story, the sense of audience”); characterization (“rate how well characters are written”); Elaboration (“rate the level of elaboration of details in the story”),

The judges’ ratings of the 61 stories correlated highly ( $r_s = .70 - .79$ ) indicating a good level of inter-rater reliability. Considering the high level of correlations between dimensions ( $r = .86-.90$ ), we conducted an exploratory factor analysis on the ratings of the eight dimensions using direct oblimin rotation. The Kaiser-Meyer-Olkin measure of sampling adequacy was .90, above the commonly recommended value of .6, and Bartlett’s test of sphericity was significant ( $\chi^2 (28) = 637, p = .000$ ). The analysis yielded a single factor solution with loadings between .54-.89 on a first factor, which explained 80% of the variance (eigenvalue= 1). Hence, all the dimensions of ratings were combined and averaged into one overall creativity score for each story.

## Results

### **Preliminary Analyses**

Consistent with the current conceptualisations of closeness and perspective as group level constructs, groups were used as units of analysis for these constructs. Before aggregating the individual responses into group level, agreement within groups was assessed (Bliese, 2000). The  $r_{wg}$  value, average interrater agreement, is a measure of within-group

agreement (i.e., how much members in a group give similar responses; James, Demaree & Wolf, 1993). Median of perspective taking scores'  $r_{wg}$  values was .87 and it was above the generally accepted cut-off of  $r_{wg} = .70$ , using a uniform expected distribution (James et al., 1993). Closeness scores'  $r_{wg}$  median was .75, also above the level of the generally accepted threshold. Following suggestions of Bliese (2000), scale Intra-class Correlations (ICC) was calculated for perspective taking and closeness to index within- and between-group variance (ICC1) as well as the reliability of group level means (ICC2). Both ICCs of perspective taking were within the generally acceptable range (.17, .38, respectively; see Woehr, Loignon, Schmidt, Loughry & Ohland, 2015). The ICC(2) coefficient for perspective taking were lower than ideal, but it was comparable to previous findings on group level perspective taking (e.g., Hoever et al., 2012). Closeness ICCs revealed a similar profile (.14, .34, respectively). Despite being lower than ideal, these ICC values are previously observed in team-based research (e.g., see Chen & Bliese, 2002; Erdogan, Liden & Kramer, 2006; Hofmann & Jones, 2005; Zhu, Gardner & Chen, 2016). In their extensive literature review, Woehr et al. (2015) found that the aggregation values found in team literature are not always exceeding the recommended threshold values (e.g., Bliese, 2000). They displayed that while the average ICC(1) on various group level constructs ranged between 0.15 to 0.22, the average ICC(2) ranged between -.44 to 0.25. Moreover, ICC2 values vary according to ICC(1) and group's size (Bliese, 1998), and they are particularly higher in larger group sizes (Klein & Kozlowski, 2000). Considering observed aggregation values altogether (i.e.,  $r_{wg}$ , ICC(1), ICC(2)), aggregation was decided to be appropriate and individual scores on closeness and perspective measures were averaged into composite group scores.

### **Manipulation Checks**

A two-way Analysis of Variance (ANOVA) with the independent variables closeness manipulation and perspective taking manipulation and the dependent variable self-other

overlap yielded a significant main effect of Closeness,  $F(1,57)= 5.37, p=.02, \eta^2= .09$ . Groups that received the closeness manipulation ( $M= 5.32, SD= .78$ ) reported higher levels of self-other overlap compared to groups that did not ( $M= 4.90, SD= .66$ ). This suggests a successful manipulation of closeness (see Table 1)

Another two-way ANOVA tested the effect of the closeness and perspective taking manipulations on the perspective taking scores and revealed a significant main effect of Perspective Taking,  $F(1, 57) = 4.90, p=.03, \eta^2= .08$ . Teams that received the perspective taking manipulation ( $M=4.96, SD= .70$ ) reported significantly higher perspective taking compared to teams that did not ( $M= 4.58, SD= .64$ ), indicating a successful manipulation of perspective taking (Table 1).

### **Descriptive analyses**

Table 2 summarizes the descriptive statistics of and correlations between the study variables. Group creativity was not correlated with self-other overlap or the perspective taking scores, but there was a significant positive correlation between perspective taking and self-other overlap.

### **Group creativity**

A 2x2 ANOVA testing the influence of the closeness and perspective taking manipulations on creativity ratings yielded a significant main effect of Closeness,  $F(3, 57) = 3.7, p =.03, \eta^2= .06$ , a marginally significant main effect for Perspective Taking,  $F(3, 57) = 3.78, p =.06, \eta^2= .06$ , and a significant interaction effect of Closeness x Perspective Taking,  $F(3, 57) = 9.6, p =.003, \eta^2= .14$ . Groups that received the closeness manipulation received a higher creativity score for their stories ( $M=5.82, SD= 1.23$ ) than groups that did not receive the manipulation ( $M= 5.25, SD= 1.30$ ). Groups that received the perspective taking manipulation ( $M=5.25, SD= 1.05$ ) received a lower creativity score for their stories than groups who did not receive the manipulation ( $M=5.82, SD= 1.46$ ).

As can be seen in Figure 1, among the groups that received closeness manipulation, group creativity scores were significantly lower for groups that received closeness combined with perspective taking manipulation ( $M=5.07$ ,  $SD=.99$ ) compared to groups that only received closeness manipulation ( $M=6.57$ ,  $SD=.98$ ). However, among the groups that were not given closeness manipulation, the groups which received only perspective taking manipulation ( $M=5.42$ ,  $SD=1.12$ ) did not differ from groups which were not given any of the manipulations ( $M=5.06$ ,  $SD=1.50$ ). Therefore, while receiving only closeness manipulation increased group creativity, the combination of closeness with perspective taking negatively influenced group creativity.

### Discussion

This study investigated whether and how the group process variables perspective taking and closeness between members affected groups' creative outputs. So far, no study has experimentally investigated the role of closeness in group creativity. Closeness was conceptualized as experiencing self and other as a coherent unit which can be achieved through reciprocal self-disclosure (Aron et al., 1992: 1997). This should direct group members to take decisions that benefit the collective rather than the self (Tu, Shaw & Fishbach, 2016). In that sense, closeness provides the social motivation aspect which is stated as one of the essential drivers of group creativity in the MIP-G model (De Dreu et al., 2008). Indeed, the findings from this study show the stories of groups receiving the closeness manipulation were rated as more creative than the stories of groups that did not receive the manipulation. This suggests that increasing group members' prosocial motivation by encouraging closeness might be an important factor in group creativity. Future research might want to investigate whether other processes positively affect group members' prosocial motivation and group creativity. For example, Bornstein, Gneezy and Nagel (2002) found

that competition between groups improved the (prosocial) motivation, coordination, and cooperation within groups, leading to better outcomes.

Groups who received the perspective taking manipulation received lower ratings of creativity compared to group who did not receive the manipulation. This finding was surprising considering the reported benefits of perspective taking for groups and its potential to set the necessary ground for social coordination (see Galinsky, Ku & Wang, 2005; Sprecher, Treger & Wondra, 2013). On the other hand, perspective taking and paying attention to others' ideas has been known for its detrimental effects on group outcomes as well (Ku et al., 2015; Gummerum, Leman, & Hollins, 2014). For example, perspective taking is less successful when individuals are busy with another task that creates cognitive load (Davis et al., 1996; Roßnagel, 2000). It is possible that writing a story collaboratively in a short time might have created such a high cognitive load that participants lost some of their creative potential when trying to attend to others' perspectives.

Despite these findings, it would be premature to discard the benefits of perspective-taking in group creativity, as perspective-taking has been shown to be an important antecedent for individual creativity (Grant & Berry, 2011; Mohrman, Gibson, & Mohrman, 2001) and an important moderator for group creativity (Hoever et al., 2012). Hoever et al. (2012) argued that perspective taking is only beneficial if there is functional diversity within group members. In a homogenous team, attending to the perspective of others might likely to cause group members to quickly reach a common ground and stop looking for different or new ideas. In conclusion, there is need for more research to understand when perspective taking might be helpful or harmful for group creativity and what other possible mediators, besides group member diversity or cognitive load, could affect the relationship between perspective taking and group creativity.



Concerning the effect of both closeness and perspective taking on group creativity, two alternative hypotheses were advanced. Following the MIP-G model, a combination of perspective taking and closeness could increase group creativity. However, based on research on the negative effects of group cohesion (Janis, 1972; Jaussi & Dionne, 2003), a combination of perspective taking and closeness could decrease group creativity. The current findings were more in line with the latter hypothesis: Receiving both closeness and perspective-taking manipulations did not benefit groups' creativity. It is possible that when group members self-disclosed and felt close to one another and simultaneously tried to be attentive to each other's ideas, they might have felt overly connected. Thus, it could be argued that there is an optimal level of connectedness or closeness which is beneficial for the creativity of groups, while being too connected is harmful for group creativity. This is in line with other research that found a curvilinear relationship between cohesion and creativity (Paulus, Dzindolet & Kohn, 2012; Woodman, Sawyer & Griffin, 1993).

This study employed a collaborative story writing task to assess group creativity, a method that has not been used in the group but only the individual creativity context (Hennessey & Amabile, 1988). Using this task has several advantages, and it can therefore be good alternative to the brainstorming tasks commonly used in the group creativity literature. First, collaborative story writing was a very engaging task, and it shares similarities to artistic and group creativity in real-life settings, unlike brainstorming (Hennessey & Amabile, 1988; Sawyer, 2011). Second, creativity was assessed with the consensual assessment technique, a robust way of assessing creativity through the actual creative performance rather than measurement of creativity skills or traits (Baer & McKool, 2009). Consensus between the judges' ratings of the creativity of the produced stories was high and demonstrated that the method was reliable to evaluate creativity of groups. Finally, the collaborative story writing

task can overcome some of the limitations tasks that assess creativity merely as divergent thinking, such as brainstorming tasks (Paulus, 2000).

Even though this study sheds a new light on the factors contributing to group creativity, it nevertheless has some limitations that should be addressed in future research. First, while well-established, the IOS is a single-item measure for closeness. Alternative scales, such as “We-ness” (Cialdini, Brown, Lewis, Luce & Neuberg, 1997), Dynamic IOS (Hodges, Sharp, Gibson & Tipsord, 2011), or the perceived similarity scale (Batson et al., 1997) could be additionally employed. Second, the measures of perspective taking and closeness were all individual experience measures. Although it was possible to observe group-related differences, these might be underestimated due to the use of individual-level measures. Thus, future studies should additionally include group based measurements (see Chatman & Fynn, 2001; Jordan & Lawrence, 2009 for examples). Third, surprisingly perspective taking was found to have negative effects on group creativity. One reason for this could be the nature of the perspective taking instructions, and future research could manipulate perspective taking with different instructions. Myers, Laurent & Hodges (2014) differentiated between “imagine other” instructions (asking to consider another’s perspective, used in the current study) and “imagine self” instructions (i.e., imagining oneself in the shoes of the other person). “Imagine self” instructions led to greater self-other overlap and greater likelihood of helping behaviour.

Future research should also continue to examine the effect of other group process variables on group creativity. A promising research avenue would be to create groups with different length and intensity of closeness manipulations, for example by assigning participants to groups depending on their attachment styles or their mutual liking levels, or by manipulating levels of trust of individual members (Aron et al., 1997). Furthermore, observing how groups with varying levels of closeness exhibit joint engagements and

dialogues might be a good indicator of the collaborative creative process (MacDonald, Miell, Morgan, 2000).

This study has not just theoretical but also applied implications. Based on the present findings, leaders should consider setting up groups with members who feel close to each other to help them boost their creativity, especially in collaborations where creative writing is required. Forming groups with members who are not very close friends but rather have a moderate level of closeness might be one way of doing this. A kick off meeting in the beginning of a project can help members to get to know each other. Given the increased importance of creative groups in work and educational settings knowing how a sense of interpersonal connectedness affects a group's creative output has important repercussions for teamwork and the creative outputs of teams.

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Table 1.  
Perspective taking and closeness means according to experimental conditions

Condition	Perspective taking score		Self-other overlap	
	M	SD	M	SD
Closeness	4.67	.70	5.24	.90
Perspective Taking	5.20	.73	5.10	.64
Combined	4.82	.61	5.40	.67
Control	4.48	.68	4.68	.64

Note. M= Mean, SD= Standart Deviation

Table 2.  
Correlations among closeness, perspective taking and group creativity scores (N=61)

	M	SD	Min	Max	Group Creativity	Closeness	Perspective Taking
Group Creativity	5.53	1.29	2.42	9.06	1	.16	.15
Closeness	5.11	.75	3.67	6.33		1	.35**
Perspective Taking	4.77	.70	3	6.33			1

Note. \*,  $p < .01$

Figure Captions

*Figure 1.* The effect of perspective taking and closeness on group creativity

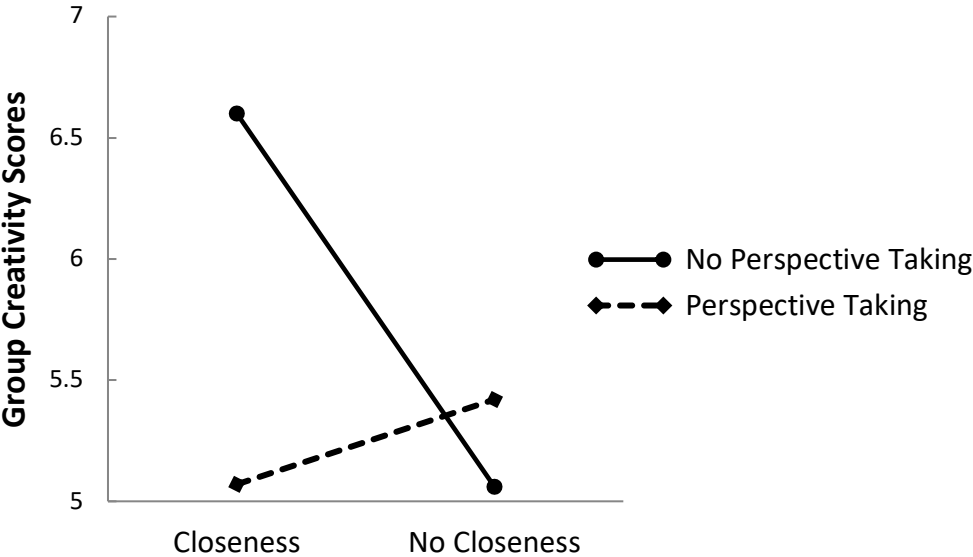


Figure 1