

Competitive mindsets, creativity, and the role of regulatory focus



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ABSTRACT

We examined how regulatory focus and intentions to compete rather than cooperate with group members relate to creativity. Study 1 showed that a promotion focus (i.e., a focus on ideals) activated a cooperative mindset, whereas a prevention focus (i.e., a focus on responsibilities) activated a competitive mindset. Whereas mindsets had no direct effect on creativity, a prevention focus was found to diminish subsequent creativity. Study 2 showed that a cooperative mindset activated a promotion focus, whereas a competitive mindset activated a prevention focus. Prevention focus carried the indirect negative effect of competitive mindsets on creativity. In addition, we tested whether global versus local information processing may explain these effects.

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1. Introduction

In recent years, much research has investigated the influence of cooperative versus competitive behavior on subsequent performance. An extensive line of research has found a positive effect of cooperative behavior on achievement (Johnson, Maruyama, Johnson, Skon, & Nelson, 1981; Roseth, Johnson, & Johnson, 2008). However, studies that have examined creativity have reported both positive and negative effects of cooperation (overview see Amabile, 1996). To date, the conditions under which cooperation enhances or diminishes creativity remain unclear. It has recently been argued that cooperative group work may help students develop critical thinking skills (Chen & Tjosvold, 2002; Fung & Howe, 2012). Cooperative group settings may lend themselves to teaching of thinking skills and creativity. However, are group settings also beneficial if students are competing with one another? Under which conditions does competition in groups enhance or diminish creative performance?

The present research closely examined the cognitive and motivational processes that may induce cooperative or competitive mindsets and, thus, change subsequent creativity. This research question is relevant for educational and organizational settings in which creative ideas are often developed in groups. Individuals may not necessarily be willing to use cooperative strategies toward group members, but may choose competitive strategies when working in a group (Johnson, Johnson, & Maruyama, 1983; Simmons, Wehner, Tucker, & King, 1988). Typically, individuals with cooperative mindsets strive for the success of the group and, therefore, show positive attitudes toward successful group outcomes (Kelley & Thibaut, 1978; Simmons et al., 1988). On the other hand, individuals with competitive mindsets strive for their personal benefit and seek success by outperforming other group members (Deutsch, 1949; van Knippenberg, van Knippenberg, & Wilke, 2001).

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Moreover, if individuals have the perception that individual goal attainment is negatively correlated with others' goal attainment they may perceive competitive settings to be threatening (Deutsch, 1949).

The present research was based on the rationale that the activation of a competitive mindset results in the willingness to choose competitive strategies toward group members (Carnevale & Probst, 1998; Simmons et al., 1988). We expected a bidirectional link between competitive mindsets and motivational factors, such as regulatory focus. Moreover, cognitive and motivational processes were expected to enhance or diminish subsequent creative performance (Förster, 2012). In the first experiment, we investigated whether motivational states (i.e., a prevention focus) activate competitive mindsets and diminish creative performance. In the second experiment, we examined whether competitive mindsets diminish creativity in situations that activate a prevention focus. Comparing the results from these two studies we aimed to get insight into underlying processes that may lead to increased or diminished creativity.

1.1. *Regulatory focus in social settings*

Regulatory focus is a motivational concept that distinguishes between promotion goals and prevention goals (Higgins, 1997, 1998). A promotion focus entails striving to achieve an "ideal self". That is, promotion-focused individuals pursue gains and strive for success and growth. A prevention focus entails striving to achieve an "ought self". That is, prevention-focused individuals aim to avoid losses and failure (Higgins, 1997, 1998). Moreover, a focus on ideals has been associated with an increased sensitivity for positive outcomes, whereas a focus on oughts and responsibilities has been associated with increased sensitivity for negative outcomes (Higgins & Tykocinski, 1992).

In social settings, differences in regulatory focus were shown to extend to choices of tactics and strategies (Higgins, Roney, Crowe, & Hymes, 1994, Study 3). For example, when choosing between alternative strategies for friendship, people with a promotion focus chose strategies geared toward promoting positive outcomes, whereas people with a prevention focus chose strategies geared toward preventing negative outcomes. In addition, it has been demonstrated that regulatory focus affects emotions and behavior toward the in- and outgroup. Shah, Brazy, and Higgins (2004, Study 1) found that participants' approach reactions toward the ingroup were positively related to their motivation for interpersonal stimulation, whereas avoidance of an outgroup was positively related to participants' motivation for interpersonal security. These differences had behavioral consequences in that promotion strength predicted how close a participant would choose to sit to a group member, whereas prevention strength predicted how close a participant would choose to sit to a competitor from the outgroup (Shah et al., 2004, Study 2). These results suggest that a promotion focus is related to the need for nurturance, whereas a prevention focus is related to the need for security and that these needs may lead to significantly different behaviors in group settings.

With regard to the consequences of regulatory focus in social settings, research has associated a prevention focus with higher scores on aggressiveness and cynical hostility (Keller, Hurst, & Uskul, 2008). Another study integrated trait regulatory focus with cooperation in social dilemmas and confirmed a negative association between a trait prevention focus and cooperative behavior in social dilemma situations (Keller & Pfattheicher, 2011).

The aim of the present research was to examine the association between a state prevention focus and cooperation versus competition and to shed light on the positive and negative influences of both constructs on creativity. In addition, we examined global versus local information processing as a possible factor connecting these concepts. In prior research, a promotion focus on advancement was associated with global (i.e., holistic) processing, whereas a prevention focus on security was associated with local (i.e., detail-oriented) processing (Förster & Higgins, 2005).

With regard to creativity, regulatory focus was found to affect creativity in that a promotion focus resulted in higher levels of creativity than a prevention focus (Friedman & Förster, 2001). A recent meta-analysis confirmed the relation between a promotion focus and high creativity and between a prevention focus and low creativity (Baas, De Dreu, & Nijstad, 2008). By contrast, some studies identified conditions in which a prevention focus may lead to similar levels of creativity as a promotion focus, such as situations in which people reflect on prevention goals that have not yet been fulfilled (Baas, De Dreu, & Nijstad, 2011).

The present research extends this reasoning by investigating the influence of regulatory focus on the willingness to choose cooperative or competitive strategies toward group members. If a promotion focus increases positive behavior toward the ingroup (Shah et al., 2004) and leads to global information processing (Förster & Higgins, 2005), it may increase an individual's willingness to choose cooperative strategies. On the other hand, a prevention focus may lead to fear of failure and local information processing (Förster & Higgins, 2005) and, thus, may increase an individual's willingness to choose competitive strategies. We conducted two studies to test these hypotheses. Furthermore, we examined the simultaneous effects of regulatory focus and competitive mindsets on subsequent creativity. In two experiments, we aimed to investigate whether regulatory focus or mindsets have a stronger effect on creativity. This would allow us to draw conclusions about mediational processes.

1.2. *Competition and creativity*

Prior research indicated that the activation of cooperation and conflict primes subsequent cognition and, thus, has an effect on creativity (Carnevale & Probst, 1998). Cooperation and social conflict were shown to lead to differing mental sets that influenced how people processed and categorized information in memory. Participants who expected cooperation had

a broader range of attention and had a tendency to see relationships among items and group them together. This type of holistic, global thinking resulted in higher levels of creativity. By contrast, expecting conflict led to more rigid, local thinking and involved a narrower range of attention. A conflict mental set resulted in fewer, less integrated categories and lower levels of creativity (Carnevale & Probst, 1998).

Furthermore, studies suggest that motivational states may influence attention (Derryberry & Tucker, 1994; Förster, Friedman, Özelsel, & Denzler, 2006). Approach-related states (e.g., joy) were shown to broaden individuals' attentional focus, whereas avoidance-related states (e.g., anxiety) were shown to narrow individuals' attentional focus (Derryberry & Tucker, 1994). Due to these results, we expected cognitive (i.e., global/local processing) and motivational states (i.e., regulatory focus) to simultaneously play a role in cooperative and competitive group settings.

1.3. Current studies

Two experiments were designed to investigate the effects of a group setting on creativity among students. Similar to a classroom situation, the experiment was set up such that participants were invited to the lab in groups but worked on the creativity task individually. Thus, we tested how a group environment activates cooperative or competitive mindsets and influences subsequent individual creativity. We expected this setting to be comparable to group work in classrooms or organizations, where tasks are divided between group members as they work on individual solutions.

Study 1 aimed to examine the links between a promotion or prevention focus and a cooperative or competitive mindset. Specifically, we expected people with a motivational promotion focus to be more willing to use cooperative strategies and people with a prevention focus to be more willing to use competitive strategies. This effect was expected to be particularly strong for the prevention focus group because the motivation to prevent failure should induce a mindset that leads people to choose competitive strategies. The perception of a threatening environment should have survival value for prevention-focused people (Friedman & Förster, 2001). Thus, these people should be more willing to use competitive strategies to achieve their aim of not failing the task. This expectation was in accordance with the association of a prevention focus with protection needs (Higgins, 1997, 1998) and the goal to prevent losses (Idson, Liberman, & Higgins, 2000). We assumed that this motivational state may lead to self-protective behavior and to the choice of competitive strategies that aim at preventing individual failure.

With regard to creativity, we expected a prevention focus to diminish subsequent creative performance (Baas et al., 2008; Friedman & Förster, 2001). This was investigated in both experiments. Furthermore, Study 2 aimed to clarify how cooperative or competitive mindsets relate to regulatory focus. To test whether a bidirectional link exists between mindsets and regulatory focus, we examined whether the instruction to cooperate versus compete with group members elicits changes in regulatory focus. A cooperative mindset was expected to induce participants to focus on ideals and to foster a promotion focus, whereas a competitive mindset was expected to induce a focus on responsibilities and, thus, the motivation to prevent failure.

In addition, Study 2 examined the influence of global and local processing on these motivational changes. If global processing is present in cooperative mindsets (Carnevale & Probst, 1998), it could activate a promotion focus in participants, which has been associated with global processing (Förster & Higgins, 2005). For a competitive mindset, the instruction to compete was expected to lead to more rigid thinking and a narrowing of the attentional field due to a state of high arousal – anxiety (Carnevale & Probst, 1998). This type of processing style has been related to threat and local processing and has been associated with a prevention focus (Förster & Higgins, 2005; Friedman & Förster, 2001). The activation of a competitive mindset could simultaneously activate a prevention focus because both concepts share features such as local information processing. Therefore, Study 2 assessed the role of global and local processing as an additional factor contributing to the bidirectional activation of both concepts.

2. Study 1

The first study examined the proposed link between regulatory focus and mindsets and how the activation of these factors may affect creativity. The hypothesis was that a promotion versus prevention focus activates a certain type of information processing that may be associated with cooperative versus competitive mindsets. In particular, work settings may promote a prevention focus such that individuals may focus on oughts and duties and are motivated to prevent failure when being evaluated. Therefore, individuals may perceive the environment as threatening and other people as competing for resources. In such a situation, the need for protection might be activated and individuals may strive to prevent outcomes that are perceived as losses (Idson et al., 2000). Thus, individuals with an activated prevention focus should be motivated to prevent failing a task, even if this means working against others.

Moreover, Study 1 investigated the effects of regulatory focus and cooperative mindsets on subsequent creative performance. Similar to prior studies (Baas et al., 2008; Friedman & Förster, 2001), we expected the activation of a promotion focus to increase creativity and the activation of a prevention focus to diminish creativity.

2.1. Method

2.1.1. Participants and design

Thirty-five Master's degree students at a German university participated and received a cinema voucher. Their average age was 25.4 years, and 71.4% of the sample was female.

The experiment included three conditions (promotion focus vs. prevention focus vs. control). The dependent variables were participants' scores on a cooperation/competition questionnaire (Simmons et al., 1988) and a creativity task related to divergent thinking.

2.1.2. Materials and procedure

Participants were greeted by the experimenter and randomly assigned to one of the experimental conditions. They were informed that they were pre-testing several unrelated tasks that would be needed for future studies. Participants first read the instructions for the regulatory focus activation, in which they were instructed to write some thoughts before the experiment began (Liberman, Idson, Camacho, & Higgins, 1999). In the promotion focus group, participants received the instruction to spend 2 min reflecting on their ideals and developmental goals. In the prevention focus group, participants were instructed to reflect on their oughts and responsibilities. The control group received no manipulation and proceeded directly with the mood questionnaire. The mood questionnaire consisted of nineteen items, with $\alpha = .83$ (Dalbert, 1992). On a scale from 1 (not at all) to 7 (very strongly), participants rated their present positive and negative mood states with (German) items such as *happy*, *sad*, or *tired*.

After the completion of the mood scale, participants were instructed to complete the questionnaire assessing cooperative/competitive mindsets. This was an adapted version of the cooperative/competitive strategy scale (Simmons et al., 1988), which had a retest reliability of .78. As a cover story, participants were informed that they would later work together with other students and that we wanted to assess their expectations for this group work. Participants were asked whether they intended to choose a cooperative (vs. competitive) strategy to achieve joint (vs. individual) success when working within a group. Fifteen items were scaled from 1 (never) to 7 (always) and contained questions such as *In the group task, my aim is to outperform others; To succeed, one must cooperate with others, or I perceive the other participants as competitors*. This scale was later recoded into a continuous variable such that larger numbers indicated a favorable attitude toward cooperative strategies and smaller numbers a favorable attitude toward competitive strategies (see Tang, 1999).

Participants were then informed that they would perform an individual creativity task. This was a divergent thinking task in which participants were asked to find instances between common concepts. Each task consisted of five words, and participants indicated the words that had similarities in that they had categories in common (e.g., *compass, clock, roadmap, polar star, course*). Pointing out more solutions represented a higher creative performance on this task. Participants completed two examples as a warm-up and then 15 items for the dependent variable. After completing this task, participants were asked to report their present mood states (Dalbert, 1992) as a post-test measure of mood as a control variable. Eventually, participants were asked if they thought that the tasks in the experiment were related and, if yes, how so. Finally, they were fully debriefed and dismissed.

2.2. Results

2.2.1. Control variable

To rule out effects of mood on the dependent measures (Hirt, Melton, McDonald, & Harackiewicz, 1996), several analyses were conducted. Participants' positive and negative mood states were not significantly different between the experimental conditions ($F < 1$). The difference between pre- and post-test of mood states was also not significant ($F < 1$). Therefore, mood did not influence effects between or within groups.

2.2.2. Cooperative/competitive mindsets

The cooperation/competition strategy scale had a satisfying $\alpha = .72$. An ANOVA revealed that the regulatory focus activation had a significant effect on intentions to cooperate versus compete, $F(1, 22) = 4.62$, $p = .04$, $\eta_p^2 = .17$. As can be seen in Fig. 1, participants reported a significantly more cooperative mindset after a promotion focus ($M = 73.33$) than after a prevention focus ($M = 66.42$). The control group's score was between those of the two experimental groups ($M = 71.82$), and this effect reached marginal significance, $F(2, 32) = 2.94$, $p = .067$, $\eta_p^2 = .16$.

2.2.3. Creativity measure

An ANOVA using creative performance as the measure showed a significant main effect of the regulatory focus activation, $F(1, 22) = 5.17$, $p = .03$, $\eta_p^2 = .19$. The promotion group had significantly higher scores on creativity ($M = 11.75$) than the prevention group ($M = 9.98$). The creative performance of the control group ($M = 11.64$) differed significantly from that of the prevention focus group ($p < .05$), but did not differ from that of the promotion focus group ($p > .05$). Furthermore, the overall effect of all three groups was significant $F(2, 32) = 3.41$, $p < .05$, $\eta_p^2 = .18$.

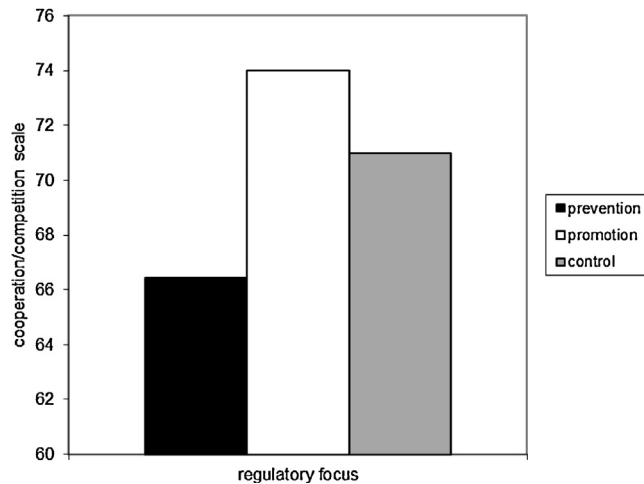


Fig. 1. Effects of regulatory focus on intentions to cooperate versus compete in a group setting.

2.3. Discussion

A promotion focus was expected to lead to a cooperative mindset and better creative performance, and a prevention focus was expected to lead to a competitive mindset and less creativity. The present results support these hypotheses and indicate that a promotion focus activated a cooperative mindset, whereas a prevention focus activated a competitive mindset. In addition, creative performance was significantly better when a promotion focus rather than a prevention focus was induced.

The finding that the control group was almost as creative as the promotion focus group may suggest that the effect was not driven by the benefit of the promotion focus and its corresponding cooperative mindset on creativity, but by the diminishing effect of the prevention focus and its competitive mindset on creativity. These findings are in accordance with results by Carnevale and Probst (1998, Experiment 1), who found that participants in a cooperation condition were equally creative as the control group and significantly more creative than participants who expected conflict. Their results indicated that this effect resulted from changes in holistic, global information processing in that participants grouped things together and integrated information in a cooperative condition, but showed less integration in a conflict condition. It seems worthwhile to further investigate this effect of global thinking and, therefore, we included such a measure as an additional variable in the next study.

3. Study 2

The aim of Study 2 was to further investigate the bidirectional link between cooperative/competitive mindsets and regulatory focus and their effects on creative performance. We tested whether the activation of a cooperative mindset has not only cognitive, but also motivational effects by inducing a promotion focus. If cooperation activates holistic, global thinking (Carnevale & Probst, 1998), these cognitive changes should also influence participants' promotion focus, which has been shown to be affected by global versus local information processing (Förster & Higgins, 2005). By contrast, a competitive mindset was expected to induce a prevention focus, which has been associated with local processing (Förster & Higgins, 2005). Thus, Study 2 aimed to extend prior results on cognitive processes (Carnevale & Probst, 1998; Derryberry & Tucker, 1994; Förster et al., 2006) and investigate whether the willingness to compete in a group activates a prevention focus.

To test these hypotheses, participants received the cover story that they would participate in a group study on teamwork and creativity. Participants took part in groups of four, and a first task was used to activate mindsets about cooperating versus competing with group members. The activation of a cooperative mindset and, thus, a promotion focus was expected to increase creativity, whereas the activation of a competitive mindset and a prevention focus was expected to diminish creativity (see Fig. 2).

Furthermore, Study 2 included a measure of global versus local information processing as an additional dependent variable. The activation of a cooperative mindset and a promotion focus was expected to be associated with global processing, whereas the activation of a competitive mindset and a prevention focus was expected to be associated with local processing. For the assessment of global/local processing we instructed participants to compare how similar or different two pictures were (Bittner, 2011, Study 3). They were presented two pictures which contained some similarities and some differences and were instructed to make a similarity-rating. This task was chosen, because prior research has provided evidence that the generation of similarities is associated with global processing, whereas the generation of differences is associated with local processing (Förster, 2009). We expected that the induction of a cooperative mindset and a corresponding promotion focus would lead participants to perceive more similarities due to global processing. By contrast, those who were induced to

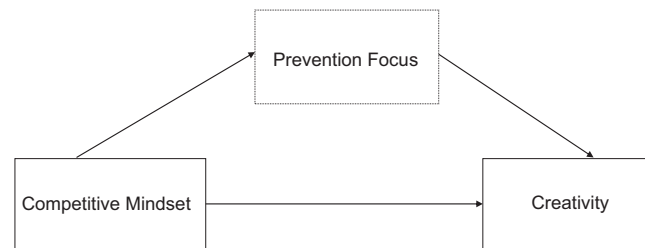


Fig. 2. Indirect negative effect of competitive mindsets on creative performance.

endorse a competitive mindset and a corresponding prevention focus were presumed to perceive more differences between the pictures due to local processing.

3.1. Method

3.1.1. Participants and design

Forty-seven undergraduate students at a German university participated and were offered a cinema voucher. The average age was 20.6 years, and 57.1% of the sample was female.

The experiment had three conditions (cooperation vs. competition vs. control), and the dependent variables were participants' situational regulatory foci (promotion vs. prevention), creativity scores on an idea generation task, and subsequent global/local ratings.

3.1.2. Materials and procedure

Individuals arrived at the lab in groups of four and were informed that they would work individually on several unrelated questionnaires. Cooperative and competitive mindsets were activated by providing a corresponding scenario to each experimental condition. This scenario informed participants about a seeming group study in order to induce cooperative versus competitive mindsets toward the group members. The cooperation group received the information that after completing individual questionnaires, they would work together with their team members on a task requiring cooperation. If the group developed a good solution, their group would receive a reward. By contrast, the competition group was informed that they would later perform a task in which they would compete against one another. Whoever won the challenge would receive a reward. The control group simply received the information that they were supposed to complete several questionnaires and that a creativity task would follow later.

After the mindset activation, participants received a questionnaire that asked them to report their promotion and prevention focus on a scale from 1 (not at all true of me) to 9 (very true of me). Nineteen items were adapted from the promotion/prevention scale (Lockwood, Jordan, & Kunda, 2002) into a state scale measuring the situational regulatory focus of participants. Nine items asked whether participants intended to use promotion strategies in the upcoming task and nine items asked whether they intended to use prevention strategies. Examples are *Right now, I imagine how I will achieve my hopes and aspirations; I am focused on preventing negative events in the following task*, or *My major goal right now is to avoid becoming a failure*. The next task was Dalbert's (1992) mood questionnaire, which was also used in Study 1 to control for effects of mood.

Then, participants were informed that they would perform a creativity task which was a typical idea generation task. They were instructed to generate as many new uses for a paper clip as possible within 10 min. Generating many new uses for an object is usually an indication of high creativity. This was an individual task, but participants were sitting in a room together with their group members. They were informed that the ideas they generated could be common or uncommon in daily life. Participants named uses, such as *wire, decoration, curtain hook*. Participants were stopped when time was up and were handed the global/local rating task (Bittner, 2011, Study 3). They were told that this was an unrelated task in which two pictures were pre-tested for further studies. Participants were instructed to rate how similar or different these pictures were on a scale from 1 (very similar) to 9 (not at all similar).

After the experiment, participants were fully debriefed (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001) and rewarded by a cinema voucher. None of the participants reported suspicion of the actual hypotheses. They proceeded with a group study, which was a separate study that took place on the same day.

3.2. Results

3.2.1. Control variable

There was no significant difference in participants' mood states between the experimental conditions and no other influence of mood ($F_s < 1$). It was concluded that mood did not drive the effects between the experimental conditions.

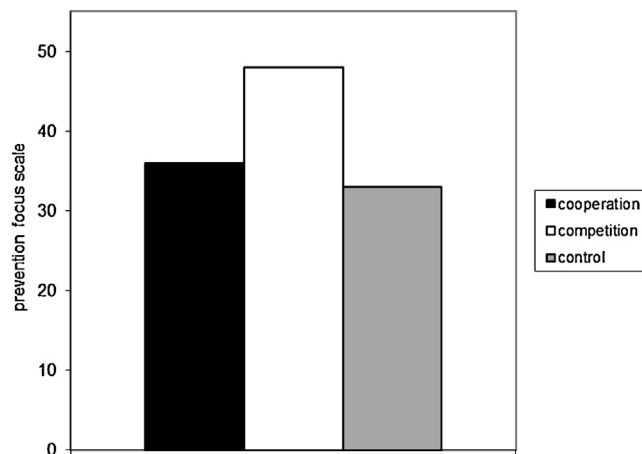


Fig. 3. Effects of cooperative versus competitive mindsets on prevention focus.

3.2.2. Regulatory focus

The adapted state scale of promotion/prevention focus (Lockwood et al., 2002) showed a satisfying $\alpha = .81$ for the promotion and $.82$ for the prevention scale. As shown in Fig. 3, the prevention focus scale revealed that the group with the competitive mindset had a higher prevention focus ($M = 47.07$) than the cooperative mindset group ($M = 35.63$). Planned contrasts indicated that this difference was significant ($p < .01$). The control group ($M = 32.06$) was significantly different from the competition group ($p < .01$), but not from the cooperation group ($p > .05$). An ANOVA indicated that the overall effect of prevention focus was significant, $F(2, 44) = 9.42, p < .001, \eta_p^2 = .30$. Results on the promotion focus scale showed a significant effect as well, $F(2, 44) = 7.59, p < .001, \eta_p^2 = .26$, but this effect was mainly due to the control group being significantly less promotion-oriented ($M = 41.06$) than the cooperation ($M = 51.38$) and the competition group ($M = 52.14$). Planned contrasts confirmed that only the differences between the control group and the two regulatory focus groups were significant ($p < .001$).

To gain additional insight into the relative strength of participants' promotion over prevention states, a continuous measure of regulatory focus was formed by subtracting prevention scores from promotion scores (Lockwood et al., 2002, p. 861). The result was a measure of the relative strength of promotion over prevention states, with higher scores indicating a relatively greater promotion than prevention focus. An ANOVA on the three groups showed a significant effect, $F(2, 44) = 4.75, p = .01, \eta_p^2 = .18$. As expected, the group with the cooperative mindset had a significantly higher promotion focus ($M = 15.75$) than the competitive mindset group ($M = 5.07$), $p < .01$; and the control group was between the two experimental groups ($M = 9$), $p > .05$.

3.2.3. Creativity

We regressed creativity scores on the experimental conditions and the prevention focus measure while controlling for the influence of mood (Hirt et al., 1996). The analysis revealed that prevention focus predicted creativity in that a low prevention focus was associated with more generated ideas, $\beta = -.39, t(29) = 2.2, p < .04$. When regressing idea generation scores on the promotion focus measure, no significant effect was found ($p > .05$).

When computing the relative strength measure of promotion over prevention states (Lockwood et al., 2002, p. 861), an additional regression analysis showed that a high relative strength of promotion focus predicted creative ideas, $\beta = .34, t(29) = 1.92, p = .06$. No other variables reached significance in predicting creativity.

3.2.4. Test for mediation

We tested whether regulatory focus mediated the relationship between competitive mindsets and creativity, using an SPSS macro provided by Jose (2003). The results indicated full mediation, Sobel $z = 2.031, p = .04$. That is, competitive mindsets had a significant indirect effect on creativity. This indirect effect of competitive mindsets was carried by prevention focus.

3.2.5. Global and local processing

An ANOVA with the global/local task as the dependent variable indicated that the overall effect of experimental conditions was significant, $F(2, 44) = 5.86, p < .01, \eta_p^2 = .21$. Participants in the cooperative mindset group showed more global processing ($M = 3$) than participants in the competitive mindset group ($M = 5.07$). Planned contrasts confirmed that this difference was significant ($p < .001$). The control group was between the two experimental groups ($M = 3.88$), but the planned contrasts did not reach significance ($p > .05$).

Further analyses on the global/local measure and prevention focus showed that a prevention focus was associated with local processing, $\beta = .33, t(45) = 2.36, p < .03$. Again, no effect was found for the promotion focus measure ($p > .05$). In line with

expectations, the measure of relative strength of promotion over prevention states indicated that a promotion focus was associated with global processing, $\beta = -.43$, $t(45) = 3.2$, $p < .01$.

Eventually, we examined whether global/local processing mediated the effect between competitive mindsets and regulatory focus, but the Sobel test was not significant. The effect of global/local processing on creativity was also not significant.

3.3. Discussion

Study 2 indicates that competitive mindsets influence students' situational prevention focus. If a group setting highlights competition and induces a competitive mindset in group members, this mindset may influence subsequent motivational states in that it induces a prevention focus, and local processing. Conversely, a cooperative mindset was associated with global processing and a reduced prevention focus. Regulatory focus, in turn, influenced creativity. Specifically, a strong prevention focus was associated with reduced creativity. The measure of the relative strength of promotion over prevention states showed a similar pattern of results as the prevention focus scale. Our findings indicate that the competition instruction drove the effect on creativity by eliciting a prevention focus.

For the influence of cooperative mindsets on the promotion focus scale, however, the picture was not as clear. On this measure, the promotion focus of both experimental groups was significantly higher than that of the control group. This outcome could be a result of the reward that was promised in the competitive group (for the "winner") and the cooperation group (if the group solves the task) but not in the control group. It seems that this reward induced a promotion focus in both experimental groups; therefore, the promotion focus scale did not differ between the experimental groups. Likewise, on the other measures, the effect of the competition group was much stronger than the effect of the cooperation group. On the prevention focus scale, the cooperation group did not significantly differ from the control group, whereas the competition group showed a higher prevention focus than both of the other groups. These findings were expected due to the theoretical reasoning that the motivation to prevent losses and failure (Idson et al., 2000) should lead to the willingness to use competitive strategies. Because prevention strategies have been associated with the need for protection and the induction of threat, the effect of a prevention focus was expected to be much stronger than the motivation to cooperate in a promotion focus.

4. General discussion

The present research examined how regulatory focus is related to the choice of cooperative versus competitive strategies in a group setting. We assumed that both concepts share cognitive and motivational components and influence subsequent creative performance. Study 1 supported the idea that cooperative versus competitive mindsets are activated by a promotion versus prevention focus and showed a diminishing effect of prevention focus on creative performance. Study 2 extended this reasoning by providing evidence that prevention focus carried the indirect effect of mindsets on creativity. Furthermore, competitive mindsets were associated with local information processing.

These results indicate that competitive mindsets are associated with a situational prevention focus and that the activation of one concept may lead to the simultaneous activation of the other concept. However, we do not claim that the two concepts are one and the same, but that they consist of similar and different facets. On the one hand, our studies show similarities, such that the two concepts share cognitive and motivational processes. On the other hand, our results demonstrate that regulatory focus and mindsets may lead to different consequences, since their influences on creativity differed. Although our results confirm the diminishing effect of prevention focus on creativity, they also show that competitive mindsets have no direct, but an indirect negative effect on creativity.

These findings complement prior inconsistent results on competition and creativity. Whereas some studies found that competition has a diminishing effect on creativity (e.g., Amabile, 1982; Deci, Betley, Kahle, Abrams, & Porac, 1981; McGlynn, Gibbs, & Roberts, 1982; Shalley & Oldham, 1997), other studies indicated that competition is beneficial for creativity (e.g., Amabile & Gryskiewicz, 1987; Cummings & Oldham, 1997; Raina, 1968). The research that showed positive effects of competition, however, did not include promotion versus prevention motivation. It is possible that motivational influences drove the effects behind cooperation and competition, such that in some settings, competition failed to induce a prevention focus and, thus, led to higher creativity. Further research should clarify the settings in which regulatory focus is activated simultaneously with cooperative or competitive mindsets – and in which settings a prevention focus may not be activated by competitive mindsets. Competition may induce lower levels of creativity only in situations in which a competitive mindset induces a prevention compared to a promotion focus.

Prior inconclusive results on creativity may also be due to differing definitions of cooperation and competition. For example, rather than activating the willingness to use competitive strategies, some designs examined the threat of being evaluated by others (e.g., Amabile, 1979; Amabile, Goldfarb, & Brackfield, 1990). An explanation for results that found negative effects of competition on creativity could be that evaluation expectancy in these studies induced the perception of threat and conflict in participants. It is possible that this perception activated a prevention focus and, thus, diminished creativity compared to studies with non-evaluative situations (Cummings & Oldham, 1997; Raina, 1968). Along the same line, non-threatening stimuli may have fostered a promotion focus in participants by providing a sense of challenge and, therefore, increasing creativity.

The influence of regulatory focus on the effectiveness of cooperation versus competition might further depend on the type of task that is used in a research design. In a meta-analysis, Johnson et al. (1981) found differing effects of cooperation

depending on whether tasks were prevention-oriented (e.g., correction tasks or simple rote decoding) or promotion-oriented (e.g., achievement tasks). The superiority of cooperation over competition was found for achievement tasks, but not for correcting and rote decoding. These results offer first evidence that tasks that induce a prevention motivation may not benefit from cooperation, whereas achievement tasks may induce a promotion focus and, therefore, may benefit from cooperation.

In the second study, we tested the effect of cooperative and competitive mindsets on a measure of similarities versus differences, which has been shown to be directly related to global versus local processing (Förster, 2009). We found that a competitive mindset led to increased local processing and that a high prevention focus was also associated with local processing. These results indicate that competitive mindsets and a prevention focus share a narrowing of the attentional field that is typical for local processing. Additional studies should more closely examine the underlying mechanism and the causal relation with global/local processing. One reason why the mediational analysis of global/local processing in Study 2 was not significant could be that the present design assessed global/local ratings after the creativity task. We assumed that idea generation could be influenced by a prior rating task and, therefore, assessed it at the end of the experiment. For the present research question the measurement of creativity was most important, but further studies may more closely examine the effects of global/local processing. We expect that assessing global/local processing before the creativity task would provide more detailed results for our hypotheses.

4.1. Outlook

Mindset theory presumes that specific situations activate procedures that people have frequently experienced in the past (e.g., Wyer & Xu, 2010). Therefore, it might be worthwhile to further specify situational cues that influence students' cooperative/competitive mindsets and regulatory foci. Environmental influences may activate specific mindsets and motivations and affect which strategies people choose when working in a group. For example, the presentation of an object related to a business context (e.g., a briefcase) was found to lead to a higher accessibility of competition (Kay, Wheeler, Bargh, & Ross, 2004, Study 1). Furthermore, these objects led people to perceive an ambiguous social interaction as less cooperative (Kay et al., 2004, Study 2). Future research may more closely examine the situations that activate competition and, thus, may subsequently lead to consequences for creativity and motivation.

In addition, further studies should investigate group-level creativity. The present research examined individual creativity because we expect that general information processing should characterize any type of task – whether performed individually or in a group setting. This design is consistent with other studies investigating individual cooperation intentions (e.g., Poortvliet, Janssen, Van Yperen, & Van de Vliert, 2009) or individual creativity (Shalley, Zhou, & Oldham, 2004), but should be supplemented by group research. For example, a recent study on work teams demonstrated the situational influence of competition by indicating that team-level competition changes motivational processes, such as the type of achievement goals that employees adopt (Heidemeier & Bittner, 2012).

In addition to its effects on creativity, the activation of a prevention focus together with a competitive mindset could lead to other behavioral consequences. With regard to the work context, research in a more naturalistic setting could test whether prevention focused people may avoid failing a task. For example, this may result in competitive behavior, such as not providing information and resources to their team members. A similar hypothesis could be tested for a promotion focus. If the activation of a promotion focus increases cooperative behavior in a group context, this behavior should enforce positive social relationships and create liking in a benign spiral (Deutsch, 1985). A promotion focus combined with cooperative behavior may increase positive relationships and, therefore, lead to higher achievement (Johnson et al., 1981; Roseth et al., 2008).

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