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Performance-Approach and Performance-Avoidance Goals: When Uncertainty Makes a Difference

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Performance-avoidance goals (the desire to avoid performing more poorly than others do) have been shown to have consistently deleterious effects on performance but the effects of performance-approach goals (trying to outperform others) are more complex. Two studies examine uncertainty as a moderator of the effect of performance-approach goals on performance. Experiment 1 shows that manipulated performance-approach goals lead to better performance than do performance-avoidance goals in the absence of uncertainty about performance but when participants learn that a coactor disagreed with them about problem solutions, creating uncertainty, performance-approach goals do not differ from performance-avoidance goals in their effect on performance. Experiment 2 shows that uncertainty also moderates the effects of self-set performance-approach goals. Moreover, the same dynamic occurs with another kind of uncertainty: negative competence feedback.

Keywords: *performance goals; uncertainty; disagreement*

From childhood, individuals learn from their parents and teachers that they should try to get good grades in school. It is then not surprising that in school or later, at the university, students may find themselves as motivated by the desire to perform well as they are by the desire to learn about particular topics. Indeed, many educational contexts can be characterized by their emphasis on relative comparisons and normative grading. A high level of achievement in these contexts means not only mastering the content of the course but also demonstrating one's competence by outperforming others.

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The goals aiming at performing well relative to others have been defined as performance goals (Ames, 1992; Dweck, 1986), sometimes labeled as ego-involving (Nicholls, 1984). These goals correspond to the desire to demonstrate abilities and are often contrasted with mastery goals (or task-involving goals; Nicholls, 1984), which correspond to the desire to acquire knowledge. Several studies have shown that mastery goals lead to adaptive outcomes such as effort, persistence after failure, and interest (cf. Ames, 1992; Ames & Archer, 1988; Dweck, 1986; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Nicholls, 1984). In contrast, performance goals have been associated with outcomes such as the choice of easy tasks (Ames & Archer, 1988; Elliott & Dweck, 1988) and superficial modes of studying in contrast to deep processing of course materials (Nolen, 1988).

As a consequence, some theorists argue that performance goals should undermine learning and performance (e.g., Dweck, 1986; Nicholls, 1984). However, many studies have failed to find negative effects of performance goals on performance (e.g., Covington & Omelich, 1984; Yates, 2000). Moreover, numerous correlational studies, carried out in classrooms, found positive links between performance goals and academic performance (Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot, McGregor, & Gable, 1999; Harackiewicz et al., 1997; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Pintrich, 2000; Skaalvik, 1997; for a review, see Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). More recently, researchers have also found positive effects of experimentally manipulated performance-approach goals (Elliot, Shell, Bouas, & Maier, 2005; Senko & Harackiewicz, 2005a).

The positive effects of performance goals are most evident when performance-approach goals are distinguished from performance-avoidance goals (Elliot, 1997, 1999; Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997). Motivation can be oriented toward either the approach of desired positive outcomes or the avoidance of negative events (cf. Atkinson, 1957). The former leads to a great investment in the situations that are likely to yield a positive evaluation. In contrast, the latter is focused on the avoidance of negative evaluation. Therefore, two forms of performance goals can be defined (Elliot & Church, 1997; Elliot & Harackiewicz, 1996): performance-approach goals (trying to obtain positive judgements) and performance-avoidance goals (avoiding negative judgements). Research has consistently shown that performance-avoidance goals are associated with low interest and poor performance (Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot et al., 1999; Sideridis, 2005; Skaalvik, 1997). In contrast, some research has shown that performance-approach goals have positive effects in some situations (e.g., college classes) or for some participants (e.g., achievement-oriented individuals; Harackiewicz, Barron, & Elliot, 1998). In fact, some theorists have argued that performance-approach goals can have positive effects on academic motivation because they promote competence valuation and mobilize effort in contexts that emphasize normative comparisons (Harackiewicz et al., 2002).

DIFFERENTIAL EFFECTS OF PERFORMANCE-APPROACH GOALS: A QUESTION OF UNCERTAINTY?

Although the approach–avoidance distinction has helped to clarify the inconsistent effects of performance goals, the findings regarding performance-approach goals remain controversial (Harackiewicz et al., 2002; Kaplan & Middleton, 2002; Midgley, Kaplan, & Middleton, 2001). Theorists have sought to identify moderators of performance-approach goal effects. It is interesting to note that Dweck and Leggett (1988) originally argued that the detrimental consequences of performance goals would appear only when individuals were faced with challenge or difficulty. Nicholls (1984) also argued that the performance goals ("ego goals" in his terms) led to a deterioration in performance only for people who had a low perception of their own abilities (see also Elliott & Dweck, 1988; Spinath & Stiensmeier-Pelster, 2003). In the same vein, Grant and Dweck (2003) showed that the debilitating effect of performance goals (defined as "ability goals") was observed only on difficult tasks.

This idea is consistent with Elliot's point of view on the effect of performance-approach and performance-avoidance goals (Elliot, 1997, 1999; Elliot & Church, 1997). Indeed, according to these authors, performance-approach and performance-avoidance goals are both motivated by fear of failure. This corresponds to the feeling that competencies are under threat, and it is defined by Atkinson (1957) as the general motive to avoid failure. Performance-avoidance goals, because they are linked to high fear of failure and low competence expectancy, focus individuals' attention on the possibility of failing and, thus, lead to a maladaptive pattern of response and poor performance (Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot et al., 1999; Skaalvik, 1997). Performance-approach goals, however, are more complex. Indeed, although linked to fear of failure, they also result from a high need for achievement and high competence expectancies. Elliot (1997, 1999) described performance-approach goals as "hybrid goals" in the sense that they serve both approach and avoidance motives. As a consequence, the effects of these goals may depend on the accessibility of each of these motivations, notably the extent to which the task enhances competence expectancies or fear of

failure. According to Elliot (1997, 1999), when a task emphasizes competence expectancy (probability of success), performance-approach goals may lead to an adaptive pattern of responses. On the other hand, in a situation emphasizing the possibility of failure, fear of failure is aroused and the performance-approach goals may then become equivalent to performance-avoidance goals. It is interesting that a study about learning a new way to solve mathematical problems by Barron and Harackiewicz (2001, Study 1) manipulated the difficulty of the task and found a positive link between performance-approach goals and performance on this task but only when the task was relatively easy. There was no relationship between performance goals and task performance when the task was difficult.

To summarize, performance-approach goals appear to be most adaptive under conditions of low task difficulty or low fear of failure. Indeed, performance-approach goals are not expected to enhance performance when fear of failure is high (Elliot, 1997) but there have not been many tests of this hypothesis. In line with this idea, Barron and Harackiewicz (2001) found that performance goals did not positively predict performance when participants confronted a difficult task, as discussed above. In other research, when participants perceived their competence as low (Elliott & Dweck, 1988) or when the task was particularly hard (e.g., Grant & Dweck, 2003), performance-approach goals even became detrimental for performance. We think that one feature common to all of these situations is that they are steeped in uncertainty. Indeed, task difficulty, low perception of ability, and fear of failure all leave the individual uncertain about expected performance. It seems, then, that uncertainty creates conditions under which performance goals are no longer helpful but may even become detrimental for performance.

A SITUATION OF HIGH UNCERTAINTY: SOCIOCOGNITIVE CONFLICT

One type of situation that occurs frequently in learning settings may be particularly likely to arouse uncertainty: confrontation with another person who disagrees about an answer. Some researchers call this situation "sociocognitive conflict" (Buchs, Butera, Mugny, & Darnon, 2004; Doise & Mugny, 1984; Mugny & Doise, 1978). For these authors, the fact that another person proposes a different answer puts an individual's knowledge into question and suggests that perhaps his or her answer is wrong (Butera & Mugny, 1995, 2001; Quiamzade & Mugny, 2001). This situation is, thus, characterized by a double uncertainty: both an uncertainty about the validity of an answer and an uncertainty about personal competence. Consistent with this idea, McGarty, Turner, Oakes, and Haslam (1993) have demonstrated that disagreement with others enhanced subjective uncertainty (see also Hardin & Higgins, 1996, for a discussion of this point). This view is also consistent with other results (Pool, Wood, & Leck, 1998) showing that disagreement with relevant others threatens self-esteem.

Many educational contexts involve the opportunity to work with other students, whether in classroom discussions, study groups, or cooperative learning units. Any time that interactions with others are possible, disagreement is likely to occur, and we believe it is important to study the effects of achievement goals in these contexts. Indeed, if being confronted with disagreement from a peer enhances uncertainty, then one might expect performance goals to lose their positive potential in these types of learning contexts.

OVERVIEW AND HYPOTHESIS

These experiments test the hypothesis that performance-approach goals will be most effective under conditions of low uncertainty and that they will be less advantageous under conditions of high uncertainty. This will be tested on typical academic tasks, namely, learning an academic text (Experiment 1) and mathematical problem solving (Experiment 2). In both studies, we manipulate uncertainty by exposing some participants to sociocognitive conflict. In Experiment 1, we test our hypothesis experimentally by manipulating approach versus avoidance performance goals and then exposing participants to another person who either agrees or disagrees with their answer. This uncertainty manipulation should lead participants to doubt the validity of their own answer. When confronted with a disagreeing other, the benefit of performance-approach over performance-avoidance goals should be lost relative to conditions in which peers agree. In Study 2, we measure self-set achievement goals and manipulate uncertainty in two ways. In addition to the manipulation of sociocognitive conflict, we also manipulate uncertainty about personal competence by providing some participants with negative feedback about their abilities.

EXPERIMENT 1

Participants received performance-approach versus performance-avoidance instructions for a text learning session and were led to think they were interacting with another person. During this "interaction," the other person either agreed or disagreed with them about the answers to questions about the text.

Method

Overview

Instructions given to participants manipulated performance-approach and performance-avoidance goals. The materials and procedure were based on the work of Darnon, Butera and Harackiewicz (2007): After the goal instructions, students were led to believe that they would interact with a partner via computers (in fact, a standardized program) about a text they were to learn. During this "interaction," they received agreeing or disagreeing replies from their partner. Thus, the design of this Experiment was a 2 (goal: performance-approach, performance-avoidance) × 2 (partner's position: agreement, disagreement) factorial design.

Pilot Study

A pilot study was conducted to determine whether our goal manipulations would influence participants' reports of performance-approach and performance-avoidance goals during the experiment. Participants were 51 French psychology undergraduates, 5 men and 37 women (9 participants did not report their sex) with a mean age of 19.39 (SD = 2.2). They received performance-approach, performance-avoidance, or no instructions (N = 17 per condition). In the performance-approach condition, participants heard the following instructions:

> The experimenters will evaluate your performance. It is important for you to perform well and obtain a good grade on the different tasks presented here. You should know that a lot of students will do this task. You are asked to keep in mind that you should try to distinguish yourself positively, that is, to perform better than the majority of students. In other words, what we ask you here is to show your competencies, your abilities.

In the performance-avoidance condition, instructions were as follows:

> The experimenters will evaluate your performance. It is important for you to avoid performing poorly and not obtain a bad grade on the different tasks presented here. You should know that a lot of students will do this task. You are asked to keep in mind that you should try not to distinguish yourself negatively, that is, try not to perform more poorly than the majority of students. In other words, what we ask you here is to avoid performing poorly.

In a control condition, no specific instructions were given. Then participants were asked to read a social psychology text and to complete performance-approach and performance-avoidance scales (Elliot & McGregor, 2001; see Darnon & Butera, 2005, for the validation in French).

Performance-avoidance goals. The independent variable was tested with two orthogonal contrasts, one opposing the performance-avoidance condition (coded +2) to the other two (–1 each) and one opposing the performance-approach (+1) to the control condition (–1). Because performance-approach and performance-avoidance goals were highly correlated (r = .31, p < .03), performance-approach goals were entered as a covariate. Results indicated that the first contrast was significant, $F(1, 47) = 5.19$, $p < .03$, $\eta^2 = .10$, whereas the other was not, $F(1, 47) = 1.32$, $p = .26$. As expected, the performance-avoidance manipulation (M = 4.35, SD = 1.01) led to a greater adoption of these goals than did the performance-approach condition (M = 3.53, SD = 1.31) and control group (M = 3.71, SD = 1.16). As expected, the covariate was also significant, $B = .34$, $F(1, 47) = 6.73$, $p < .02$, $\eta^2 = .12$.

Performance-approach goals. The independent variable was tested with two orthogonal contrasts, one opposing the performance-approach condition (+2) to the two others (–1 each) and another one opposing the performance-avoidance (+1) to the control condition (–1). Performance-avoidance goals were entered as a covariate. Results indicated that the first contrast was significant, $F(1, 47) = 5.37$, $p < .03$, $\eta^2 = .10$, whereas the second was not, $F(1, 47) < 1$. The performance-approach manipulation (M = 4, SD = 0.86) enhanced the adoption of these goals compared to the two other conditions (M = 3.61, SD = 1.13 for the performance-avoidance condition; M = 3.27, SD = 1.25 for the control group). The covariate, as noted above, was also significant. Therefore, these instructions were used to induce performance-approach and performance-avoidance goals.

Participants

Eighty psychology undergraduates of a French university volunteered in the experiment for extra-credit points. One participant appeared to be an outlier because she had an uncommon studentized deleted residual (Judd & McClelland, 1989) and, thus, has been dropped from the analyses. The final sample was composed of 79 participants (between N = 19 and N = 20 per condition), 6 men and 73 women, with a mean age of 21.72 (SD = 3.8). In this experiment, as in Experiment 2, the majority of participants were women, which reflects the distribution of students in the department of psychology. We tested for sex effects and found no significant effects, nor did the inclusion of sex as a factor change any of the results reported here.

Procedure

Participants arrived at the laboratory in groups of four. First, they were informed that they would have to study a social psychology text cooperatively in dyads. The text was about eyewitness testimony and had been extracted from an applied social psychology textbook (Py & Rainis, 2001). Participants were informed that they would communicate with their partner in a computer-mediated interaction. Specifically, they would each answer questions about the text and discuss them with their partner. After the general instructions, participants were given either performance-approach or performance-avoidance instructions (those tested in the pilot study). They were then separated in different rooms. Separately, they were told that they would be the first to answer the questions about the text and were shown how to use the computer.

The text was divided into four sections. One question was asked for each section. First, a part of the text appeared on the screen. Participants were instructed to read it and to press a key when finished. Then, the question appeared on the screen, which participants answered. These were open-ended questions that referred to the factual content of the text. For example, one question about information processing was as follows: "Which one of the two types of information processing (deep vs. surface) favors a global representation of the person?" Participants had to type in their answer and send it to their partner. After a few seconds, they received the so-called partner's answer, which in fact was a prerecorded sentence sent by the computer.

The partner's messages had been standardized to induce, or not, a disagreement, which was the second independent variable. Indeed, the question was easy enough that almost all participants gave the correct answer to all questions (but they did not receive feedback about the correctness of their answers). The partner's answer (actually the prerecorded answer) was, therefore, either in agreement or in disagreement with the participant's. For example, as an answer to the question mentioned earlier, all participants correctly answered "deep processing."[1] In the disagreement condition, the partner's answer was as follows:

> I rather thought that the surface processing was the one which led to a global representation (taking into account only the main characteristics) whereas the deep processing took into account more information and, thus, favored a detailed vision, a specific one.

In the agreement condition, the partner's answer was this: "Yes, that's also what I would have answered." Disagreements were, therefore, based on incorrect answers from the partner (as in Mugny, Lévy, & Doise, 1978) but corresponded to a plausible (nonaberrant) point of view. After receiving the partner's answer, participants could decide whether to respond to their partner. They also had the option of returning to the text if they wished. The same procedure was carried out for the four questions. The partner's answer to Question 2 was always an agreement, just to make the procedure plausible. Hence, there were three disagreements and one agreement in the disagreement conditions and four agreements in the agreement conditions. After this interaction phase, participants were asked to complete a questionnaire (see the next section) and take a multiple-choice test on the information contained in the text.

Measures

Manipulation check. Participants were asked to report the amount of divergence between their partner and themselves ($M = 2.91$, $SD = 2.03$) on a scale ranging from 1 (*very little*) to 7 (*very much*). To measure uncertainty, participants were asked to report to what extent their partner's answer made them doubt their own answer ("made you think you had not understood the text well," "made you think you weren't very competent in these types of tasks," "made you feel afraid to say or to have said something wrong," $M = 2.25$, $SD = 1.53$, $\alpha = .87$).

Return to the text. Participants had the opportunity to go back to the text after reading the partner's answer. The number of returns was recorded ($M = 1.03$, $SD = 1.38$).

Reply to the partner. After the partner's answer, participants also had the opportunity to reply to their partner. The number of replies ranged from 0 (*never answered*) to 4 (*decided to answer for all questions*; $M = 1.48$, $SD = 1.25$).

Performance. Performance was measured in terms of the score on the multiple-choice test containing 12 questions assessing the understanding of the text. This questionnaire, although in a multiple-choice format, was not merely a recall task because it involved questions that required participant to apply the notions studied in the text to a problem. Because of the possible negative points (–0.25 for each mistake), scores ranged from –3 to +12 ($M = 7.17$, $SD = 2.4$).

Results

Manipulation Check of Disagreement

Because variance was quasi-null in one condition, the perceived divergence variable has been transformed into a nominal variable opposing 1 (*very little*) to 2 through 7

TABLE 1: Zero-Order Correlations for Experiment 1

Variable	*1*	*2*	*3*	*4*
1. Uncertainty	1.00			
2. Return to the text	.45***	1.00		
3. Reply to the partner	.44***	.60***	1.00	
4. Performance	–.25*	–.03	–.11	1.00

*$p < .05$. **$p < .01$. *** $p < .001$.

(*at least "a little" perceived divergence*). Participants in the disagreement condition all checked within the 2 to 7 range ($N = 40/40$) while 38 of 39 participants in the agreement condition checked 1, $\chi^2(1) = 72.25$, $p < .001$.

For the variables below, a 2 (goals: performance-approach, performance-avoidance) × 2 (partner's position: disagreement, agreement) ANOVA was performed. Zero-order correlations are reported in Table 1.

Manipulation Check of Uncertainty

The significant main effect of partner's position on uncertainty, $F(1, 75) = 92.68$, $p < .001$, $\eta^2 = .55$, revealed that disagreement ($M = 3.35$, $SD = 1.43$) made participants more uncertain than agreement did ($M = 1.12$, $SD = 0.35$). The main effect of goals was not significant, $F(1, 75) < 1$. However, the interaction between the two variables approached significance, $F(1, 75) = 2.95$, $p < .09$, $\eta^2 = .04$. Uncertainty was higher in the performance-approach condition ($M = 3.7$, $SD = 1.49$) than in the performance-avoidance condition ($M = 3.0$, $SD = 1.32$) only when there were disagreements, $F(1, 75) = 4.62$, $p < .04$, $\eta^2 = .06$. Without disagreement, uncertainty was low in both performance-approach ($M = 1.07$, $SD = 0.24$) and performance-avoidance ($M = 1.17$, $SD = 0.43$) goal conditions. The two conditions did not differ, $F(1, 75) < 1$.

Return to the Text

The main effect of partner's position was significant, $F(1, 75) = 35.88$, $p < .001$, $\eta^2 = .33$. After disagreement ($M = 1.77$, $SD = 1.56$), participants chose to go back to the text more than after agreement ($M = 0.25$, $SD = 0.49$). Moreover, the marginal main effect of goals, $F(1, 75) = 2.88$, $p < .10$, $\eta^2 = .04$, indicated that participants in the performance-approach conditions ($M = 1.23$, $SD = 1.67$) tended to return to the text more often than those in performance-avoidance conditions ($M = 0.80$, $SD = 0.99$). This effect was qualified by a significant interaction between partner's position and goals, $F(1, 75) = 4.2$, $p < .05$, $\eta^2 = .05$. The difference between approach ($M = 2.25$, $SD = 1.80$) and avoidance ($M = 1.30$, $SD = 1.13$) goals appeared only under disagreement, $F(1, 75) = 7.1$, $p < .01$, $\eta^2 = .09$. It was not significant in the agreement condition, $F(1, 75) < 1$, $M = 0.21$, $SD = 0.53$ for performance-approach, $M = 0.30$, $SD = 0.47$ for performance-avoidance.

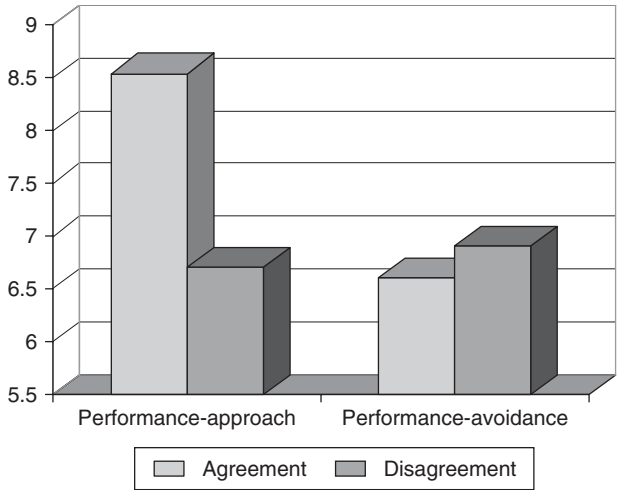

Figure 1 Performance as a function of partner's position and goal condition (Experiment 1).

Reply to the Partner

A main effect of partner's position, $F(1, 75) = 49.46$, $p < .001$, $\eta^2 = .38$, indicated that after disagreement ($M = 2.25$, $SD = 1.8$) participants chose to reply more than after agreement ($M = 0.69$, $SD = 0.91$). Neither the main effect of goal, $F(1, 75) < 1$, nor the interaction, $F(1, 75) = 2.67$, $p = .11$, $\eta^2 = .03$ were significant.

Performance

Neither the main effect of disagreement, $F(1, 75) = 2.14$, $p = .15$, $\eta^2 = .03$, nor the main effect of goals, $F(1, 75) = 2.74$, $p = .10$, $\eta^2 = .04$, reached significance. However, as expected, the interaction between the two variables was significant, $F(1, 75) = 4.26$, $p < .05$, $\eta^2 = .05$. Simple effects show that, as can be seen in Figure 1, the performance-approach condition ($M = 8.54$, $SD = 2.25$) led to a better performance than did the performance-avoidance condition ($M = 6.6$, $SD = 1.66$) but only in the agreement conditions, $F(1, 75) = 6.83$, $p < .02$, $\eta^2 = .08$. When associated with disagreement, the performance-approach ($M = 6.7$, $SD = 2.51$) and the performance-avoidance conditions ($M = 6.91$, $SD = 2.71$) were equivalent, $F(1, 75) < 1$. It is worth noting that these analyses also indicated that in the performance-approach condition disagreement led to poorer performance than agreement, $F(1, 75) = 6.15$, $p < .02$, $\eta^2 = .08$. No differences were observed in the performance-avoidance goals condition, $F(1, 75) < 1$.

Discussion

As expected, disagreement made participants uncertain about the validity of their answer and encouraged behaviors intended to reduce this uncertainty. Indeed, participants chose to return to the text more after disagreement than after agreement. In the same vein, disagreement encouraged exchanges; participants who had been confronted with disagreement not only reread the text more but also replied more to the partner, echoing Festinger's (1950) view that disagreement is the key element making people communicate. Moreover, our results helped clarify the distinctive effect of performance-approach and performance-avoidance goals. Indeed, under conditions of disagreement performance-approach goals promoted the return to the text after the partner's answer, a behavior quite typical of approach motivation (Elliot, 1997).

Replicating earlier findings (e.g., Elliot & Church, 1997; Elliot et al., 1999), we found that performance-approach goals were more beneficial for performance than were performance-avoidance goals but—and this is the contribution of the present experiment—only under conditions of agreement (low uncertainty). We found a different pattern of results when there were disagreements; in this condition of uncertainty, the two goals led to the same low level of performance.

Thus, the results of this experiment support the hypothesis that positive effects of performance-approach goals may only appear when uncertainty is low. However, important limitations may be noted. First, as mentioned earlier, theorists have argued that disagreement introduces a double uncertainty: an uncertainty about the correctness of an answer and an uncertainty about personal competence (Butera & Mugny, 2001). In this experiment, the conflict manipulation raised uncertainty about the correctness of an answer but did not necessarily raise uncertainty about personal competence. Indeed, disagreements in this study were oriented toward the content and interpretation of the text, and there was no reference to the participant's ability (see Darnon, Buchs, & Butera, 2002, for different formulations of interpersonal conflict). An interesting extension of these findings would be to explore whether the same effects occur under conditions of uncertainty about personal competence. In other words, would performance-approach goals prove maladaptive if, instead of doubting the validity of their answer, participants were led to doubt their personal competence? Experiment 2 will address this question.

Moreover, in this experiment, goals were manipulated. However, much of the achievement goal literature concerns studies of self-set achievement goals, and positive links between performance-approach goals and academic performance have been documented most extensively in studies in which goals are not manipulated but measured (e.g., Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot et al., 1999; Harackiewicz et al., 1997; 2000; 2002; P. Pintrich, 2000; see, however, Senko & Harackiewicz, 2002, or Elliot et al., 2005, for exceptions). Experimentally manipulated goals do not always have the same effects that self-set goals do (Barron & Harackiewicz; 2001; Linnenbrink, 2005). It is, therefore, important to examine moderators of self-set goal effects. In Experiment 2, we tested the moderation of the effects of self-set performance-approach and performance-avoidance goals on performance by disagreement and negative feedback. We should observe a similar pattern of moderation as in Experiment 1, such that performance-approach goals should be most predictive of performance under conditions of low uncertainty.

EXPERIMENT 2

As in Experiment 1, participants were led to think they were interacting with a coactor during a learning task. This experiment, however, differs from Experiment 1 in three ways: First, in contrast to Experiment 1, the performance-approach and performance-avoidance goals were not manipulated but rather assessed as self-report variables. Second, in addition to the disagreement factor, another factor was manipulated to create uncertainty: negative feedback about personal competence. Finally, the task used in Experiment 2 was different from the task used in Experiment 1. It involved learning a new technique to solve multiplication problems.

As in Experiment 1, disagreement was predicted to moderate the effect of performance-approach goals; that is, the benefits of performance-approach goals should appear only without disagreement. The same moderation should be observed with negative feedback, such that performance-approach goals should have positive effects in the absence of negative feedback. In contrast, performance-avoidance goals should always negatively predict performance, regardless of disagreement or negative feedback.

Method

Participants

For extra credit, 133 undergraduate students at a large Midwestern U.S. university participated. They were 77 women and 56 men randomly assigned to one of the four experimental conditions (between N = 30

and N = 35 per condition). As in Experiment 1, no main effect of sex was observed, and the inclusion of sex as a factor did not change any of the results reported here.

Procedure

The procedure was close to that used in Experiment 1 but it was adapted to the math task as well as the feedback variable. Two or four same-sex participants came to the lab at the same time and were informed that they would study a new method to solve mathematical problems mentally, without paper and pencil. There were two contiguous rooms, each with two computers, and each participant sat in front of a computer. The experimenter stood between the two rooms so that he or she could talk to the four (or two) participants at the same time. Participants were first asked to fill out a goal questionnaire. Then they were told that the new method would be taught on the computer and that at some point they would communicate with one of the three other participants (or if they were two participants, with the other) via Ethernet.

The first part of the program was a test of math abilities. Participants were asked to solve as many problems as possible using their regular way of solving problems (they were given a paper and a pencil and had to report their answer on the computer). After 2 minutes, they had to hit a button, which brought them to the next screen. On this screen, participants read, "Now that you have solved some problems using the traditional method, it is time to start learning the new method." Then, on the same page, the negative feedback was or was not introduced. In the negative feedback condition, the screen contained the following sentence: "Our research indicates that the ability to learn this new mental math technique depends on basic mathematical skills. Your score on the last problem set indicates that:" and then four options were presented: "You should find it easy to learn the new method," "You should learn the method with only minor difficulties," "You may have some difficulty learning the new method," and "You may have a lot of difficulty learning the new method." The third one ("some difficulty") was checked and written in red (the others were written in black). The screen in the no feedback condition did not contain this information.

Next, the experimenter took away the paper and pencils and asked participants to put their headphones on and start the learning program. This method was inspired by Flansburg and Hay (1994) and involves a left-to-right strategy to solve two-digit multiplication problems mentally (see Barron & Harackiewicz, 2001).

At the end of this learning session, they had the opportunity to practice on a set of problems. They were then told that they would start the "cooperative learning" time. For each phase of the four problems, participants were presented with a multiplication problem and were asked to type their answer and the number they obtained at different steps of the method to reach this answer. Then they were asked to hit a button that ostensibly sent their answer to their partner via Ethernet. They then received the partner's answer. This answer was either in disagreement or in agreement with the participant's own answer. In the disagreement condition, the partner gave an incorrect solution that corresponded to a common mistake for this task on three of the four problems. In the agreement condition, the partner always agreed; that is, he or she always gave the correct answer.[2] Participants had the opportunity to answer their partner or they could just wait until the experimenter's signal to continue. The procedure was the same for the four problems.

After the last of these four problems, they received the "official problems sets" on paper. They had 6 minutes to solve as many problems as possible using the new technique. Afterward, they were asked to complete a questionnaire containing the manipulation check of the disagreement and negative feedback. They were then thanked and debriefed.

Measures

Pretest ability. The number of problems correctly solved on the pretest was used as a baseline measure of initial ability ($M = 4.56$, $SD = 1.73$).

Achievement goals. The performance-approach and performance-avoidance goals measures were based on scales developed by Elliot and McGregor (2001). The performance-approach goals scale contained 3 items ("It is important for me to do well compared to others in this experiment"; "It is important for me to do better than other students"; "My goal in this experiment is to perform better than most of the other students on the math problems," $M = 4.36$, $SD = 1.49$, $\alpha = .93$). The performance-avoidance goals scale contained 2 items ("My goal in this experiment is to avoid performing poorly"; "I just want to avoid doing poorly in this experiment," $M = 4.98$, $SD = 1.37$, $\alpha = .72$).

Manipulation check of disagreement. Participants were asked to report the number of problems on which they and their partner disagreed ($M = 1.36$, $SD = 1.27$) during the interaction on a scale from 0 to 4.

Manipulation check of uncertainty. Participants were asked to report how often during the experiment they felt uncertain about their answer ("thought they had not understood the method well," "thought they were

TABLE 2: Descriptive Statistics and Zero-Order Correlations for Experiment 2

Variable	*Possible Range*	*M*	*SD*	*1*	*2*	*3*	*4*	*5*
1. Performance-approach goals	1-7	4.36	1.49	1				
2. Performance-avoidance goals	1-7	4.98	1.37	.53***	1			
3. Pretest math ability	0-10	4.56	1.73	.05	.16	1		
4. Perceived competence	1-7	5.89	1.20	.12	–.10	–.01	1	
5. Uncertainty	1-7	2.67	.91	.10	.24**	–.10	–.57***	1
6. Performance (problems correctly completed)	0-63	27.88	8.28	–.02	–.05	.32***	.28**	–.33***

*$p < .05$. **$p < .01$. ***$p < .001$.

not very competent in using this method," "felt afraid that they had given incorrect answers") on a scale ranging from 1 (*not at all*) to 7(*very much*), $M = 2.67$, $SD = 1.20$, $\alpha = .80$.

Manipulation check of perceived competence. Participants were asked to report the extent to which they thought they "understood the method well," "managed to solve the problems correctly," "are competent on this type of task" on a scale from 1 (*not at all*) to 7 (*very much*), $M = 5.89$, $SD = 0.91$, $\alpha = .89$.

Performance. The number of problems correctly solved on the official sets was the measure of performance. This score ranged from 3 to 50 ($M = 27.88$, $SD = 8.28$).

Results

Descriptive and Correlational Analyses

Overall, participants reported endorsing performance-approach goals ($M = 4.36$, $SD = 1.49$) to a lesser extent than performance-avoidance goals ($M = 4.97$, $SD = 1.37$), $F(1, 131) = 26.04$, $p < .001$, $\eta^2 = .17$. The positive correlation between these two goals ($r = .53$) suggests that participants who adopted performance-approach goals were also likely to adopt performance-avoidance goals. The descriptive statistics and zero-order correlations for variables measured in Experiment 2 are reported in Table 2.

Overview of Regression Analyses

Multiple regressions analyses were used to analyze data. The basic model tested on each outcome included the main effects for performance-approach goals, performance-avoidance goals (both measured continuously), disagreement (–1 = agreement, 1 = disagreement), feedback (no feedback = –1, negative feedback = 1). Moreover, initial math ability was entered as a covariate. Multicolinearity statistics indicated correct indexes.

Interactions were based on the centered variables. In preliminary analyses, all possible two- and three-way interactions were tested. Interactions that were not significant in preliminary analyses (at a level of $p < .01$) were trimmed from the final model. Thus, the final model included 11 terms: 5 main effect terms (performance-approach goals, performance-avoidance goals, disagreement, feedback, pretest ability) and 6 interactions terms (disagreement × feedback, disagreement × performance-approach goals, disagreement × performance-avoidance goals, performance-approach goals × performance-avoidance goals, feedback × performance-approach goals, disagreement × feedback × performance-approach goals). Predicted values were used to interpret significant interactions.

Manipulation Check

Disagreement. As in Experiment 1, the variance of the perceived divergence variable was quasi-null in one of the conditions. Thus, it has also been dichotomized into a nominal variable opposing 0 or 1 perceived divergence to 2, 3 or 4 perceived divergences. Fifty-nine participants perceived at least 2 divergences between themselves and their partner in the disagreement condition, whereas only 2 did in the agreement condition, $\chi^2(1) = 105.12$, $p < .001$.

Uncertainty. As far as uncertainty was concerned, the overall model was significant, $F(11, 119) = 2.05$, $p < .03$. It revealed a main effect of disagreement, $B = .23$, $F(1, 118) = 4.62$, $p < .04$, $\eta^2 = .04$. As in Experiment 1, participants doubted their own answers more in the disagreement condition, $M = 2.89$, $SD = 1.26$, than in the agreement condition, $M = 2.44$, $SD = 1.10$. Moreover, the main effect of performance-avoidance goals, $B = .27$, $F(1, 118) = 8.52$, $p < .005$, $\eta^2 = .07$, indicated that the higher the performance-avoidance goals, the greater the uncertainty about the answer. No other effects were significant.

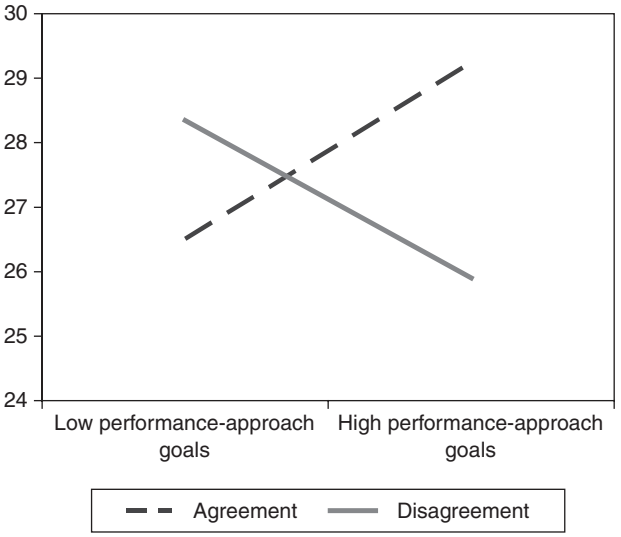

Figure 2 Link between performance-approach goals and performance as a function of partner's position (Experiment 2).

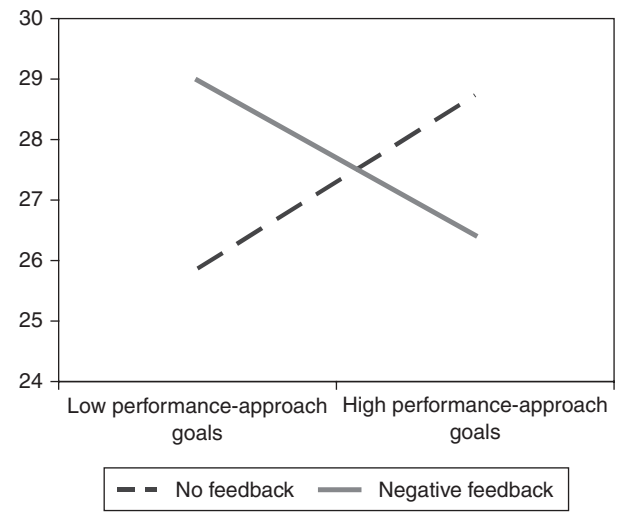

Figure 3 Link between performance-approach goals and performance as a function of feedback (Experiment 2).

Perceived competence. The overall model was not significant, $F(11, 118) = 1.35$, $p = .20$. However, it revealed a negative main effect of feedback, $B = -.18$, $F(1, 118) = 4.58$, $p < .04$, $\eta^2 = .04$. Negative feedback induced lower perceptions of competence, $M = 5.72$, $SD = 1.01$, than the condition without feedback, $M = 6.04$, $SD = 0.78$. There was also a significant main effect of performance-approach goals, $B = .18$, $F(1, 118) = 7.63$, $p < .007$, $\eta^2 = .06$, and a marginally significant main effect of performance-avoidance goals, $B = -.13$, $F(1, 118) = 3.14$, $p < .08$, $\eta^2 = .03$. The higher the performance-approach goals endorsement, the higher the perceived competence, but the higher the performance-avoidance goals endorsement, the lower the perceived competence.

Performance

As far as performance was concerned, the overall model was significant, $F(11, 119) = 3.74$, $p < .001$. It revealed a significant main effect for pretest ability, $B = 1.69$, $F(1, 119) = 18.98$, $p < .001$, $\eta^2 = .14$. The higher the initial ability, the higher the score on the official problem sets. Moreover, as expected, we found a significant interaction between performance-approach goals and disagreement, $B = -1.29$, $F(1, 119) = 5.48$, $p < .03$, $\eta^2 = .04$. As can be seen in Figure 2, the slope for performance-approach goals was positive in the agreement conditions ($B = 1.05$) but negative in the disagreement conditions ($B = -1.01$).

We had predicted the same type of moderation by the negative feedback and, indeed, the interaction between performance-approach goals and feedback was significant, $B = -1.36$, $F(1, 119) = 7.21$, $p < .009$, $\eta^2 = .06$, indicating that performance-approach goals positively predicted performance when there was no feedback ($B = 1.22$) but negatively predicted performance when there was negative feedback ($B = -1.18$). This result is illustrated in Figure 3.

Finally, a three-way interaction between disagreement, feedback, and performance-approach goals was observed, $B = -1.06$, $F(1, 119) = 4.74$, $p < .04$, $\eta^2 = .04$. As can be seen in Figure 4, the moderation of the performance-approach goal effect by the negative feedback was most evident in the disagreement as opposed to agreement condition. In fact, the only condition in which performance-approach goals negatively predicted performance was the condition with both disagreement and negative feedback ($B = -3.59$). In this condition, the more participants endorsed performance-approach goals, the more poorly they performed.

We had predicted a main effect for performance-avoidance goals, indicating that the higher the performance-avoidance goals, the lower the performance. Contrary to this hypothesis, performance-avoidance goals did not have a significant main effect on performance, $B = -.48$, $F(1, 119) = .66$, $p = .42$, $\eta^2 = .005$. However, an interaction between the two goals, $B = .71$, $F(1, 119) = 5.59$, $p < .03$, $\eta^2 = .04$, indicated that the effect of performance-avoidance goals varied according to the level of performance-approach goal endorsement. Performance-avoidance goals negatively predicted performance, as predicted, but only when associated with a low performance-approach goal. This result is illustrated in Figure 5.

Moreover, an interaction between performance-avoidance goals and disagreement was observed, $B =$

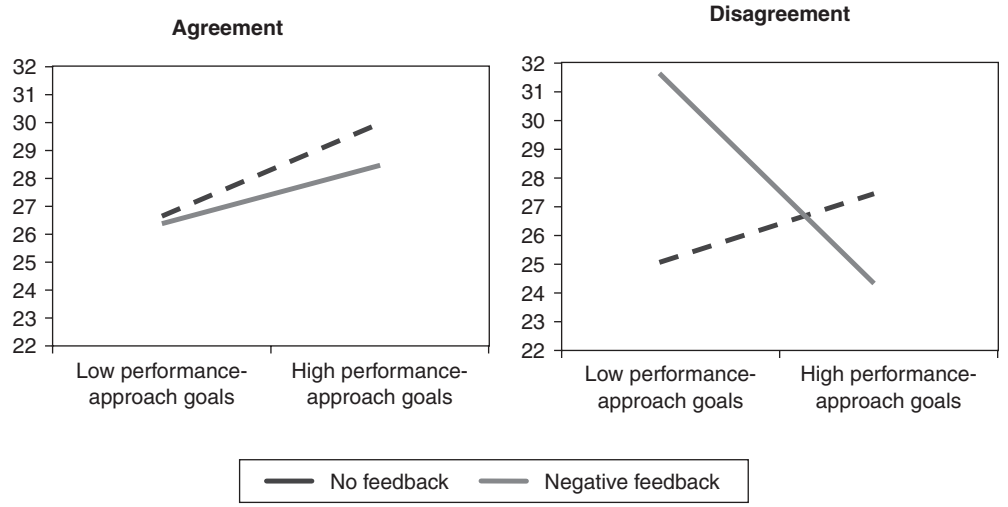

Figure 4 Link between performance-approach goals and performance as a function of partner's position and feedback (Experiment 2).

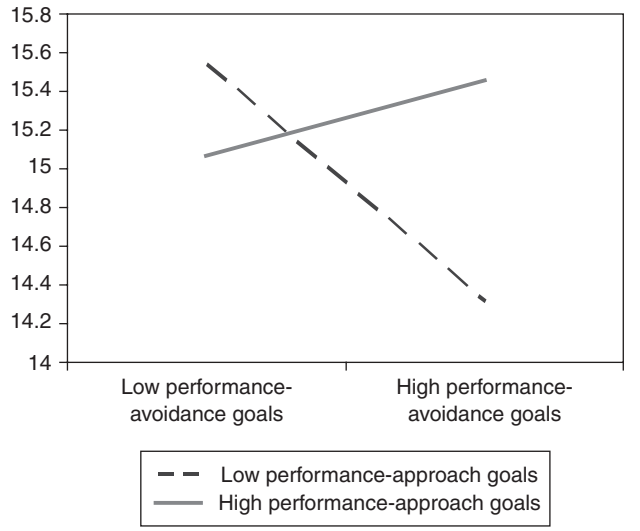

Figure 5 Link between performance-avoidance goals and performance as a function of level of performance-approach goal endorsement (Experiment 2).

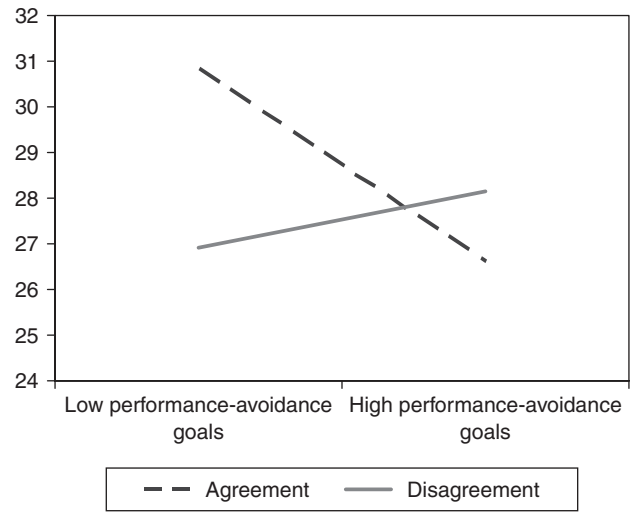

Figure 6 Link between performance-avoidance goals and performance as a function of partner's position (Experiment 2).

1.25, $F(1, 119) = 4.52$, $p < .04$, $\eta^2 = .04$. As can be seen in Figure 6, the negative relation between performance-avoidance goals and performance was observed only in the agreement condition ($B = .73$). In the disagreement conditions, performance was low regardless of the level of endorsement of performance-avoidance goals ($B = -1.78$).

Discussion

This experiment was designed to address two issues. First, we sought to replicate the findings of Experiment 1 but with self-set goals rather than manipulated goals. Second, we addressed the question of whether the moderation of performance-approach goals effects by disagreement would also be observed with a different manipulation of uncertainty, one based on personal competence rather than the validity of an answer.

Our manipulation check results indicated that the negative feedback and disagreement were both effective in inducing uncertainty. As in Experiment 1, disagreement enhanced uncertainty about the validity of the participant's answers (even though they were correct). In contrast, the negative feedback did not enhance uncertainty about the validity of an answer but only uncertainty

about personal competence. Although these two factors led to different kinds of uncertainty, they each moderated the effects of performance-approach goals in the same way. Indeed, we observed an interaction between performance-approach goals and disagreement as well as an interaction between performance-approach goals and negative feedback. The first interaction affords a conceptual replication of Experiment 1. The second indicated that the same dynamic appeared with uncertainty about personal competence.

We expected performance-avoidance goals to be negatively linked to performance across experimental conditions. Contrary to this hypothesis, the main effect of performance-avoidance goals was not significant. However, the significant interaction between performance-avoidance goals and disagreement revealed that performance-avoidance goals were predictive of performance (as also found by Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot et al., 1999; Sideridis, 2005; Skaalvik, 1997) but only in no-conflict conditions. Under conflict conditions, however, performance was low regardless of performance-avoidance goal endorsement, perhaps because all participants experienced uncertainty when their partner disagreed with them. Moreover, this interaction effect is consistent with the results of Experiment 1, indicating that performance-avoidance goals undermined performance relative to performance-approach goals in agreement conditions but not in disagreement conditions.

The high correlation between performance-approach and performance-avoidance goals suggests that individuals can and do adopt both types of goals and that it is important to test their separate and interactive effects (Barron & Harackiewicz, 2001; Pintrich, Conley, & Kempler, 2003). The interaction between performance-avoidance and performance-approach goals indicates that, when associated with strong endorsement of performance-approach goals, performance-avoidance goals were not detrimental to performance. This result suggests that endorsing both kinds of performance goals may be more adaptive than endorsing only performance-avoidance goals, perhaps because the approach goal buffers the negative effect of the avoidance goal. This finding highlights the possibility of multiple goals endorsement, a possibility so far addressed only for mastery and performance-approach goals (Barron & Harackiewicz, 2001; Harackiewicz et al., 2002).

GENERAL DISCUSSION

The aim of these two experiments was to address the question of performance goal effects on performance. We hypothesized that performance-approach goals should enhance performance as compared to performance-avoidance goals but only under conditions of low uncertainty. In contrast, performance-avoidance goals were expected to undermine performance regardless of the level of uncertainty. Considered together, the results of our experiments strongly support our hypothesis. In Experiment 1, this hypothesis was explored in a setting in which we manipulated conflict through the confrontation with a disagreeing versus agreeing coactor. Results showed that as expected, and as observed in previous research (McGarty et al., 1993), the manipulation of conflict enhanced uncertainty. The critical test of our hypothesis, however, concerned performance. Performance-approach goals indeed had an advantage over performance-avoidance goals in case of agreement but this benefit was lost as soon as participants were confronted with disagreements. Consistent with our hypothesis, then, it was only when uncertainty was low (no disagreement) that performance-approach goals had more positive effects on performance than performance-avoidance goals did. In Experiment 2, the same hypothesis was tested in a situation in which we manipulated two kinds of uncertainty: uncertainty about the correct answer (affording a conceptual replication of Experiment 1) and uncertainty about personal competence (extending our findings). In addition to the disagreement manipulation, some participants received negative feedback about their early performance. Moreover, in this experiment, goals were measured rather than manipulated as in Experiment 1. Results not only replicated the findings of Experiment 1, showing a moderation of the effects of performance-approach goals by disagreement, but also demonstrated that the same dynamic happened with negative competence feedback.

Taken together, these two experiments confirm, in line with the revised perspective of achievement goals (Harackiewicz et al., 2002), that performance-approach goals can have positive effects on performance. It should be noted, however, that in the present studies as well as in previous research, this positive link can be understood in terms of the particular goal structure implicit in the research context (Meece, Anderman, & Anderman, 2006), namely a large university. At the university, indeed, competence is typically defined in terms of relative abilities. In other words, the goal to outperform others is consistent with the contextual goal structure and is, in this sense, adaptive. This could explain why, in such a structure performance-approach, goals positively predict achievement. Our results, however, highlight that this benefit is not observed in all situations. Indeed, when participants felt uncertain about their answer or their ability, performance-approach goals did not promote performance. In a condition of very high uncertainty, such as the condition in Experiment 2 in which there was both

negative feedback and disagreement from the partner, performance-approach goals were actually detrimental for performance. This finding is consistent with Elliot's (1999) point of view that these goals are hybrid goals and that their effects are mixed and highly dependent on the context. Our results are also consistent with the Barron and Harackiewicz (2001) study documenting that the effects of performance-approach goals were moderated by task difficulty. Although they found positive of performance-approach goals on easier problems, performance- approach goals failed to predict performance on more difficult problems, perhaps because participants were uncertain of their ability to solve them.

As far as performance-avoidance goals are concerned, our findings showed, as in previous research, that these goals are not adaptive (see Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot et al., 1999; Sideridis, 2005; Skaalvik, 1997). The results of Experiment 2 qualified this general assertion, however, because performance-avoidance goals did not have uniformly negative effects on performance. In situations of high uncertainty, the negative relationship between performance-avoidance goals and performance was attenuated. Moreover, we found significant interactions between performance-approach and performance-avoidance goals, suggesting that the negative effects of avoidance goals can be compensated by performance-approach goal endorsement. Even if our results support the idea that these goals never lead to positive outcomes, they do suggest that in some situations (disagreement), or when associated with other more positive goals (performance-approach), these goals are not negatively linked to performance.

It is important to note that we only examined performance goals in this research, but uncertainty might also moderate mastery goals effects and this will be important to examine in future research. More specifically, and in contrast to performance goals, we might expect mastery goals to be particularly adaptive in high uncertainty conditions. Indeed, recent research indicates that performance is promoted when mastery goals are associated with high levels of task difficulty (Senko & Harackiewicz, 2005a) or pursued in conflict conditions (Darnon et al., 2007). Future research will also have to clarify the precise nature of the uncertainty created in the present experiments. Uncertainty may be related to self-efficacy (Bandura, 1982), and it is possible that participants doubted their ability to achieve certain levels of performance. Another possibility is that what matters is the uncertainty about one's ability to provide evidence of her or his competence. In the two kinds of uncertainty conditions studied here, participants were not sure whether they could achieve their performance goals (to perform well relative to others). This may have caused them switch to some self-handicapping strategies, such as withdrawal of effort, thereby undermining their performance (Rhodewalt & Tragakis, 2002).

Moreover, one possible interpretation of these findings could be that the effect of disagreement (Experiments 1 and 2) and negative feedback (Experiment 2) could have been, in fact, to transform the performance-approach goals into performance-avoidance goals. This idea would be supported by recent results from Senko and Harackiewicz (2005b), who showed that poor performance on early exams enhanced the endorsement of performance-avoidance goals. One could argue that the participants in our study who had endorsed performance-approach goals may have actually switched to an avoidance focus after a disagreement or negative feedback. This could explain why, in these latter conditions, performance-approach goals had negative links to performance. A study measuring goals before and after a disagreement or a feedback manipulation would allow closer analysis of this possibility.

In sum, we believe that these studies contribute to an understanding of achievement goals processes. Consistent with recent research (see Senko, Durik & Harackiewicz, in press), these results suggest that performance-approach goals, when not associated with uncertainty, have positive effects on performance. However, our results also indicate that as soon as students become uncertain, either because of doubts about their answer or because of doubts about their ability to answer correctly, performance-approach goals become less adaptive. This point is of great importance. Indeed, because many studies have now shown the positive link between performance-approach goals and exam performance, one might recommend promoting not only mastery but also performance-approach goals in classrooms (e.g., Hidi & Harackiewicz, 2000; Rawsthorne & Elliot, 1999). Our results, however, indicate that performance-approach goals may only have positive effects if what is demanded in the task is something that seems easy and does not enhance uncertainty. This is a very important issue. Indeed, we think it is almost impossible—and not desirable—to make academic work free from uncertainty. As argued before, academic contexts imply discussions and thus conflict. The results of the current research suggest that in such contexts, performance-approach goals may become detrimental to learning.

NOTES

1. Because the partner's responses were preprogrammed, it was impossible to create agreement if the participant got two or more problems wrong. Five participants were excluded from the sample on this basis. We did, however, retain participants who got one problem wrong because it was possible to establish agreement on three of the four trials. The pattern of results did not change if we excluded these individuals from analyses.

2. As in Experiment 1, the participants who gave an incorrect answer for two problems or more were dropped from the analyses ($N = 16$). We did, however, retain participants who got only one problem wrong. The pattern of results did not change if we excluded these individuals from analyses.

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