

# The Interplay of Mastery and Performance Goals in Social Comparison: A Multiple-Goal Perspective

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Régner, Escribe, and Dupeyrat (2007) recently demonstrated that not only performance-approach and performance-avoidance goals (respectively, the desire to outperform others and not to be outperformed by others) but also mastery goals (the desire to acquire knowledge) were related to social comparison orientation (SCO, the tendency to search for social comparison information). In the present article, the possibility of a link between mastery goals and social comparison that depends on the level of performance-approach goals—a possibility supported by a multiple-goal perspective—was tested by examining the interaction effect between mastery and performance-approach goals. This is an important endeavor, as educational settings are rarely free from performance-approach goals, even when mastery goals are promoted. In Study 1, we tested self-set achievement goals (mastery, performance-approach, and performance-avoidance goals) as predictors of SCO; the interaction between mastery goals and performance-approach goals indicated that the higher the performance-approach goal endorsement, the stronger the link between mastery goals and SCO. In Study 2, we manipulated goal conditions; mastery goals predicted interest in social comparison in the performance-approach goal condition only. Results are discussed in terms of the importance of multiple-goal pursuit in academic settings.

*Keywords:* social comparison, performance goals, mastery goals, multiple goals

Social comparison, basically defined as the tendency to search for information about the self through others (Festinger, 1954; Gibbons & Buunk, 1999; Wood, 1989), is an important activity in educational structures. Indeed, most of them promote social comparison using various systems of normative grading, streaming, ranking, and selection (see Ames, 1992; Covington, 1992; Darnon, Dompnier, Delmas, Pulfrey, & Butera, 2009; Levine, 1983; Urdan, 2004). However, what do students expect when they compare with others? What are the goals involved in social comparison? Previous research has argued that only performance goals (the desire to show competencies and to obtain positive judgments as compared with others), and not mastery goals (the desire to acquire knowledge), are conducive to social comparison activities (Ames, 1992; Maehr & Midgley, 1991). More recently, Régner, Escribe, and Dupeyrat (2007) demonstrated that not only performance-approach and performance-avoidance goals (respectively, the desire to outperform others and not to be outperformed by others) but also mastery goals were related to social comparison orientation

(SCO, the tendency to search for social comparison information). They pointed out the independent effects of each type of goals. We wish to contribute to this theoretical and empirical tussle by adopting a multiple-goal perspective (Barron & Harackiewicz, 2000) and proposing the hypothesis that interactions between goals may also influence the orientation toward social comparison: We claim that the link between mastery goals and social comparison can be moderated by the level of performance-approach goals. This is an important endeavor, as educational settings are rarely free from performance-approach goals, even when mastery goals are promoted.

## Achievement Goals and Social Comparison

In the literature on achievement goals, two main goals are usually defined (for reviews, see Elliot, 2005; Harackiewicz, Barron, & Elliot, 1998; Pintrich & Schunk, 2002). Mastery goals correspond to the desire to progress and improve one's own abilities, whereas performance goals correspond to the desire to outperform others (performance-approach goals) or not to be outperformed by others (performance-avoidance goals).<sup>1</sup> Although some authors would rather consider goals as reasons for engaging in an activity (e.g., Dweck, 1992), most authors now point out that goals are best conceived of as aims (Elliot, 2005; Elliot & Thrash, 2001; Van Yperen, 2003), that is, as a "cognitive representation of

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<sup>1</sup> It is worth noting that according to some authors, mastery goals can be divided into mastery-approach goals and mastery-avoidance goals (Elliot & McGregor, 2001; Van Yperen, 2006); however, the current discussion does not bring this distinction into play, as it is not relevant for the present research (see also Footnote 3).

a competence-based possibility that an individual seeks to attain” (Elliot & Thrash, 2001, p. 144). In the present research, we adopted the latter approach.

In this literature, one of the main differences between performance goals and mastery goals is the standard through which competence is defined. Competence can be conceived of either with reference to one’s own past performance (temporal comparison) or with reference to the others’ performance (social comparison). According to this framework, when pursuing performance goals, people are concerned with social comparison, which is not the case within mastery goals. Indeed, in this latter case, regardless of what the others’ performance is, what is important is the comparison between one’s past level of knowledge and one’s current level of knowledge. Thus, according to this framework, social comparison is associated with the pursuit of performance goals (both approach and avoidance) but not the pursuit of mastery goals. In line with this idea, many results suggest that social comparison is a more important concern when pursuing performance goals than mastery goals (Ames, 1992; Butler, 2005; Maehr & Midgley, 1991; see also Kaplan & Maehr, 2007).

However, existing research does not fully support the idea that mastery goals have nothing to do with social comparison. Indeed, some authors have suggested that both performance and mastery goals actually predict interest in social comparison. For example, Butler (1992) argued that because social comparison can actually serve self-evaluative motives as well as self-improvement motives (Wood, 1989), social comparison information might usefully serve both mastery and performance goals. She further demonstrated that students are interested in different kinds of social comparison information, including how to learn from others’ answers (mastery goal) versus how to self-evaluate compared with others (performance goal). Yet even if students did so for different reasons, in both cases they searched for social comparison (see also Butler, 1993, 1995).

Given this situation, Régner et al. (2007) recently tested whether each type of self-set goals (mastery, performance-approach, and performance-avoidance goals) significantly predicted SCO, a scale that measures the extent to which people are inclined to search for social comparison information (Gibbons & Buunk, 1999). In a classroom context, Régner et al. observed that both performance goals (approach and avoidance) and mastery goals predicted SCO. Even if the link between mastery goals and SCO was lower than for performance-approach and performance-avoidance goals, it still existed and was observed after controlling for performance goals effects. This result challenges the existing literature on achievement goals by pointing out that contrary to what has been argued for years, mastery goals might not be free from social comparison concerns.

The positive link existing between mastery goals and social comparison raises important avenues in achievement goals research. In particular, as it has been argued for years that mastery goals were not linked to social comparison, one could now wonder about the generality of this link. In the present research, we examined to what extent this link depends on the level of performance-approach goals. Such a possibility is supported by a multiple-goals approach. Indeed, recent research has demonstrated that goals can be endorsed simultaneously.

## The Multiple-Goal Approach

Mastery and performance goals have long been considered mutually exclusive. Indeed, authors have considered that an individual could pursue either one or the other type of goals but not both simultaneously (e.g., Dweck, 1986; Dweck & Leggett, 1988). This is probably the main reason why, in this area of research, few studies have examined interactions between goals (for a discussion of this point, see Barron & Harackiewicz, 2001). However, as some authors have observed (for a review, see Harackiewicz et al., 1998), in most research, mastery and performance-approach goals are not negatively correlated. In some research, they are even positively correlated (e.g., Barron & Harackiewicz, 2001; Darnon, Muller, Schragar, Pannuzzo, & Butera, 2006; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Midgley, Arunkumar, & Urdan, 1996; Roeser, Midgley, & Urdan, 1996; Wolters, 2004; Wolters, Yu, & Pintrich, 1996). This observation suggests that students can actually pursue both types of goals simultaneously.

Based on this observation, some research has been developed to examine the possible consequences of multiple-goal endorsement. This research suggests that multiple-goal endorsement can in many cases be the most adaptive motivational pattern (see, e.g., Bouffard, Boisvert, Vezeau, & Larouche, 1995; Fox, Goudas, Biddle, & Duda, 1994; Harackiewicz, Barron, Tauer, & Elliot, 2002; Linnenbrink, 2005; Pintrich, 2000; Shih, 2005; Steinberg, Singer, & Murphey, 2000; Wentzel, 1991). According to Barron and Harackiewicz (2000, 2001), four patterns could account for the benefits of multiple-goal endorsement. The *additive goal pattern* suggests that both mastery and performance-approach goals have independent positive main effects on a given outcome (e.g., exam grade). In the *specialized pattern*, mastery and performance-approach goals affect different outcomes (for instance, interest and performance, respectively; for a review, see Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). In the *selective goal pattern*, individuals could actually switch from one type of goals to the other depending on the situation requirement. Finally, and most important for the current discussion’s contention, the *interactive pattern* consists of an interaction effect between mastery and performance-approach goals such that an outcome appears when both mastery and performance-approach goals are high. In other words, the link between one type of goals and the outcome increases with the other goals’ level of endorsement.

We think the question of multiple-goal endorsement is particularly relevant when it comes to interest in social comparison. Indeed, let us think about what makes a student interested only in reaching mastery goals from a student who endorses multiple goals. One possibility could be that in the case of multiple-goal endorsement, mastery goals may actually “serve” performance goals. As noted by Wentzel (1991), mastery and performance goals are not necessarily independent because to perform, one may need to master the task. Thus, it seems reasonable to think that in the case of both goal endorsements, one type of goals may actually serve the others. For instance, one can be motivated to master the task in order to achieve performance goals (being better than others). Let us note that this idea is congruent with a view of goals as aims. This idea is also congruent with the positive correlation often observed between the two goals (see above or Harackiewicz et al., 1998). Let us apply this reasoning to social comparison. When mastery goals serve performance goals, it seems reasonable

to think that mastery goals are associated to social comparison motives. In other words, when a high mastery goal endorsement is associated to a high level of performance goal endorsement, the mastery concern should be associated to social comparison motives (these students not only want to master the task, they want to master it more than others). This should not be the case of students who endorse mastery goals without endorsing performance-approach goals.

Various methods have been used to address the question of multiple goals. Some of this research has manipulated each type of goal separately and compared these conditions with a condition in which the two types of goals were simultaneously manipulated (Barron & Harackiewicz, 2001, Study 2; Linnenbrink, 2005; Steinberg et al., 2000). Other research has tested multiple goals with measured self-set goals. However, such research primarily used cluster analyses (Riveiro, Cabanach, & Arias, 2001; Valle et al., 2003) or median split (Fox et al., 1994; Ng, 2006; Pintrich, 2000; Shih, 2005). According to Barron and Harackiewicz (2001), median split is not ideal for testing multiple-goal effects; rather, it can be done not only by testing independent goals' effects on various outcomes (which can bring support to the additive or specialized pattern hypotheses) but also by examining interactions between goals. Notably, entering interaction terms in the regression analyses is necessary to test for the interactive pattern hypotheses. As noted by Barron and Harackiewicz, "given the possibility that individuals can and do pursue multiple goals, it is critical to test the simultaneous effects of mastery and performance goals, as well as test whether mastery and performance goals interact" (p. 707). Thus, the contribution of the multiple-goal approach to the present research is both theoretical and methodological.

### Overview and Hypotheses

The aim of the present research was to test whether the link between mastery goals and social comparison can be moderated by the level of performance-approach goal endorsement. We argue that the link between mastery goals and social comparison should increase when associated with high performance-approach goals (i.e., in the case of multiple-goal endorsement). Thus, our main hypothesis involves an interaction effect between mastery and performance-approach goals. In Study 1, we examined the links between the three types of self-set goals (mastery, performance-approach, and performance-avoidance goals) and SCO. Both the main effects and the interactions effects were considered in the analyses. We expected the link between mastery goals and SCO to be moderated by the level of performance-approach goals; in other words, this link should be stronger with the increase of performance-approach goals. In Study 2, we tested the same hypothesis in an experimental design with a task-specific measure of social comparison. Mastery goals were expected to predict more interest in social comparison in a performance-approach goal condition than in the two other goal conditions.

### Study 1

The present study aimed to test the link between mastery goals and social comparison in a university classroom and, more importantly, the possible interactions between mastery and performance-approach goals in predicting SCO. Participants were asked to

report their level of mastery, performance-approach and performance-avoidance goals endorsement, and SCO during one of their classes.

### Method

**Participants and procedure.** Two hundred sixty-six first-year French psychology students took part in the study. Missing data resulted in 24 participants being eliminated from the analyses. Thus, the final sample was composed of 242 students—210 women and 31 men (one did not report his or her sex), with a mean age of 19.22 years ( $SD = 1.82$ ).<sup>2</sup> Participants completed a questionnaire containing goals and SCO scales during one of their social psychology classes. The study was presented as a large survey on students' motivation in the psychology department.

**Measures.** In the present study, both goals and SCO were measured.

**Achievement goals.** Achievement goals were assessed through Elliot and McGregor's scale (2001; see Darnon & Butera, 2005, for the validation in French). Students were asked to report to what extent each statement was true for them on a scale ranging from 1 (*not at all*) to 7 (*very much*). Three items of performance-approach (e.g., "It is important for me to do well compared to others in this class";  $\alpha = .88$ ,  $M = 3.35$ ,  $SD = 1.48$ ), mastery-approach (e.g., "I want to learn as much as possible from this class";  $\alpha = .88$ ,  $M = 5.52$ ,  $SD = 1.19$ ), and performance-avoidance goals (e.g., "My goal in this class is to avoid performing poorly";  $\alpha = .77$ ,  $M = 4.49$ ,  $SD = 1.45$ ) were used.<sup>3</sup>

**SCO.** Students' SCO was measured through the translated 11-item Iowa–Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999). The 11 items were translated into and subsequently back-translated from French by two researchers, both fluent in French and English. In the questionnaire, these items were preceded by the following instructions:

Most people compare themselves from time to time with others. For example, they may compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly "good" or "bad" about this type of comparison, and some people do it more than others. We would like to find out how often you compare yourself with other people. To do that, we would like to ask you to indicate how much you agree with each statement below.

The scale ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). Examples of items included "I often try to find out what others think who face similar problems as I face" and "I always pay a lot

<sup>2</sup> In the two studies—and as is often the case in psychology classes—the majority of participants were women. Because of the very unequal number of participants per cell, it was not possible to test for sex effects and interaction between sex and goals. However, for Study 1 and for Study 2, the whole analyses were repeated only on women participants. These analyses yielded almost identical results and a similar effect size to those obtained with the whole sample.

<sup>3</sup> It is important to note that the three mastery–avoidance goal items were also included in the present research. In preliminary analyses, these goals were entered in the regression analyses. Because they neither predicted SCO nor interacted with other goals and were not theoretically relevant here, these goals were not retained in the final regression model.

of attention to how I do things compared with how others do things." The social comparison score was the sum of answers and could range from 0 to 77 ( $\alpha = .78$ ,  $M = 47.5$ ,  $SD = 9.51$ ).

**Initial ability.** To control for initial ability, we took the record of the mean grade that participants obtained to the *baccalauréat* (the French final high school certificate, necessary to enroll in university). This grade could range from 0 to 20 ( $M = 11.45$ ,  $SD = 1.29$ ).

## Results

**Correlation among variables.** Intercorrelations among variables are presented in Table 1. These correlations indicated that the three goals are intercorrelated ( $r_s > .15$ ). SCO appears to be linked to performance-approach and mastery goals as well as to the *baccalauréat* score (initial ability). All these links are positive. Performance-avoidance goals are not significantly correlated to social comparison.

**Overview of the regression analyses.** The regression analyses included the three goals (mastery goals, performance-approach goals, and performance-avoidance goals) as well as their interactions. The three goal measures were centered by subtracting the goal mean from each value. Moreover, to control for initial ability, we entered the mean *baccalauréat* grade as well as the interaction between the covariate and each type of goals in the analyses (Yzerbyt, Muller, & Judd, 2004). However, because these interactions were not theoretically relevant in the present research, they are not discussed further. Thus, the final regression model included 15 terms: three main effect terms (mastery goals, performance-approach goals, performance-avoidance goals), three two-way interaction terms among the three goals, the three-way interaction term among the three goals, the covariate (initial ability), and the seven interaction terms relative to the covariate. The SCO score was regressed on this model. To interpret significant interactions, we computed predicted values for representative high and low groups (one standard deviation above and below the mean) from the regression equations using nonstandardized regression coefficients (Aiken & West, 1991).

**Achievement goals and social comparison.** The overall model was significant,  $F(15, 231) = 4.61$ ,  $p < .001$ ,  $R^2 = .23$ . It appeared that both performance-approach goals,  $B = 1.71$ ,  $F(1, 226) = 15.76$ ,  $p < .001$ ,  $\eta_p^2 = .07$ , and mastery goals,  $B = 1.73$ ,  $F(1, 226) = 8.53$ ,  $p < .004$ ,  $\eta_p^2 = .04$ , positively predicted SCO. More interesting, the predicted interaction between these two goals was significant,  $B = 0.99$ ,  $F(1, 226) = 6.34$ ,  $p < .02$ ,  $\eta_p^2 = .03$ . As evident in Figure 1, the higher the performance-approach goals, the stronger the link between mastery goals and SCO. Analyses of

simple slopes indicated that this relationship was significant and positive for participants with a high endorsement of performance-approach goals (1 *SD* from the mean: 4.43),  $B = 3.01$ ,  $F(1, 226) = 12.27$ ,  $p < .001$ ,  $\eta_p^2 = .05$ , but not significant for participants with a low endorsement ( $-1$  *SD* from the mean: 1.86),  $B = 0.45$ ,  $F(1, 226) < 1$ .

Performance-avoidance goals were not a significant predictor of SCO,  $B = 0.46$ ,  $F(1, 231) = 1.08$ ,  $p = .30$ . However, the interaction between performance-approach and performance-avoidance goals was significant,  $B = -0.77$ ,  $F(1, 226) = 7.06$ ,  $p < .009$ ,  $\eta_p^2 = .03$ . This suggests that the link between performance-avoidance goals and SCO was stronger when performance-approach goal endorsement was low. Simple slope tests revealed that this relationship was significant and positive for participants with a low endorsement of performance-approach goals ( $-1$  *SD* from the mean: 1.86),  $B = 1.22$ ,  $F(1, 226) = 5.19$ ,  $p < .03$ ,  $\eta_p^2 = .02$ , but not significant for participants with a high endorsement (1 *SD* from the mean: 4.43),  $B = -0.77$ ,  $F(1, 226) = 1.39$ ,  $p > .23$ ,  $\eta_p^2 < .01$ .

It is worth noting that initial ability also significantly predicted SCO,  $B = 1.43$ ,  $F(1, 226) = 9.09$ ,  $p < .003$ ,  $\eta_p^2 = .04$ . In other words, the better the *baccalauréat* grade, the higher the propensity to compare with others.

## Discussion

In the present study, performance-approach goals were strong predictors of SCO, which is consistent with Régner et al.'s (2007) study as well as with achievement goal literature, according to which social comparison is a very important component of performance-approach goals (e.g., Ames, 1992; Dweck, 1986). It is interesting to note that the zero-order correlation between performance-approach goals and SCO was only of medium size ( $r = .33$ ). This result supports the idea that even if SCO and performance-approach goals are correlated, they do not correspond to the same construct. Moreover, mastery goals also predicted SCO. As in the results obtained by Régner et al., this result challenges the classical view of mastery goals that argues that when pursuing mastery goals, students are not at all concerned with social comparison (e.g., Dweck, 1986).

As far as performance-avoidance goals are concerned, in the present study, the main effect of performance-avoidance goals on SCO is not significant, unlike in Régner et al. (2007). In the present research, indeed, the link between performance-avoidance goals and SCO actually depended on the level of performance-approach goals—namely, it appeared when performance-approach goals were low. In other words, one has to endorse strongly either performance-approach goals, performance-avoidance goals, or both goals to report a high level of SCO. Those who weakly endorse both performance goals, however, do not report a high level of SCO. An explanation of the lack of significant main effect of performance-avoidance goals could stem from the nature of the items used to measure performance-avoidance goals in the two studies. Indeed, in the present study, the performance-avoidance goals items did not explicitly refer to social comparison. It is worth noting that in a review article, Elliot and Thrash (2001) commented on this scale: "In the performance-avoidance goal items, normative competence is clearly implied, although it is not made an explicit focus of the goal statement" (p. 152; see also Elliot &

Table 1  
Zero-Order Correlations Among Variables (Study 1)

Variable	1	2	3	4	5
1. Initial ability	—				
2. Performance-approach goals	.18**	—			
3. Performance-avoidance goals	-.17**	.15*	—		
4. Mastery goals	.01	.26***	.19**	—	
5. Social comparison orientation	.21***	.33***	.08	.18**	—

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

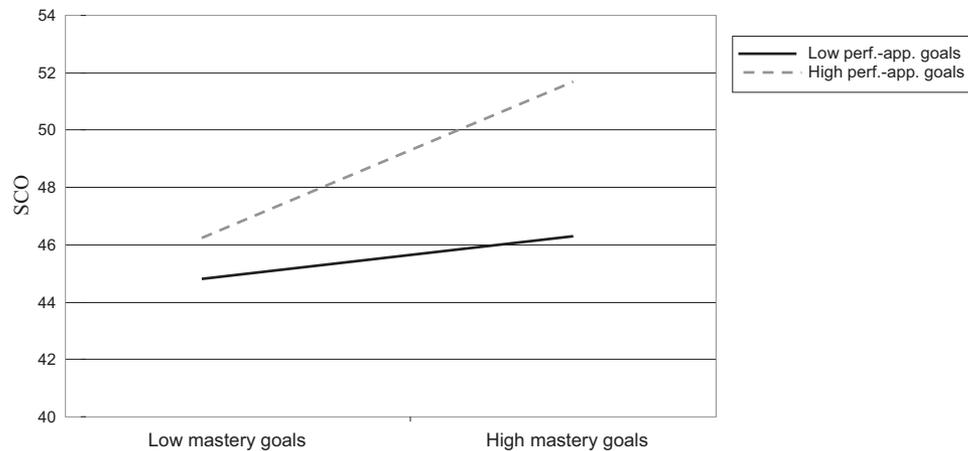


Figure 1. Link between mastery goals and social comparison orientation (SCO) as a function of level of performance-approach (perf.-app.) goal endorsement.

Murayama, 2008). In a recent article, Pekrun, Elliot, and Maier (2006) modified the original scale in order to make the performance-avoidance goals items explicitly emphasize a normative referent (“My goal is to not perform poorly relative to my classmates.”). Régner et al.’s items, on the other hand, are extracted from the Pattern of Adaptive Learning Survey (Middleton & Midgley, 1997); at least some of these items clearly refer to social comparison (e.g., “The reason I do my math work is so the teacher does not think I know less than others.”). In addition, in a study comparing these different scales, Smith, Duda, Allen, and Hall (2002) noted that the performance-avoidance goal items are quite different from one scale to the next (for a discussion of this point, see also Kaplan & Maehr, 2007). In sum, the measure of performance-avoidance goals used in the present study does assess performance-avoidance goals, as indicated by the above-mentioned research, but the lack of explicit reference to social comparison could explain the difference in the prediction of SCO observed in our and Régner et al.’s study.

More importantly, the present study observed an interaction between mastery and performance-approach goals, indicating that the link between mastery goals and SCO varied depending on the level of performance-approach goals. The higher the performance-approach goals, the stronger the link between mastery goals and SCO. This point is of high importance because it specifies the results obtained by Régner et al. (2007). Indeed, the results of the present study showed that the mastery goals–SCO link is qualified by an interaction, showing that the extent to which mastery goals predict SCO depends significantly on the level of performance-approach goal endorsement. This link was significant when performance-approach goals were high but not when performance-approach goals were low.

This first study presents two limitations that are addressed in Study 2. First, the aim of the present research was to test whether the link between mastery goals and social comparison depends on the level of performance-approach goal endorsement; however, Study 1 was completely correlational, and the link between mastery goal endorsement and social comparison was studied as a function of self-set performance-approach goals. Thus, to allow for a causal interpretation of the role of performance approach goals,

we needed an experimental study testing the same hypothesis by manipulating performance-approach goals. In Study 2, to be as close as possible to Study 1 and to make the comparison across studies possible and relevant, we studied the link between mastery goal endorsement and social comparison (the core question of the present research) as a function of manipulated goals. Moreover, the first study assessed general interest in social comparison with a dispositional scale (SCO). We argue that when participants are asked in a given task to pursue performance-approach goals, their self-set mastery goals should also predict specific interest in social comparison information during the task. Study 2 uses such a measure.

## Study 2

The link between mastery goals and interest in social comparison arguably depends on the level of performance goals. Mastery goals should predict interest in social comparison more when associated to performance-approach goals than in the other goal conditions. Thus, Study 2 examined the link between self-set mastery goals and social comparison in four goal conditions—namely, mastery, performance-approach, performance-avoidance, and control conditions.

## Method

**Participants and procedure.** One hundred one first-year French psychology students took part in the study and were randomly assigned to the four goal conditions (between 24 and 26 participants per condition). One participant was excluded from the analysis due to missing data. The final sample was composed of 90 women and 10 men, with a mean age of 18.97 years ( $SD = 1.46$ ).

**Procedure.** Two participants came to the laboratory at the same time. After filling out the consent form, participants were informed that they would carry out a verbal task and were asked to answer the mastery goal scale. Then, depending on the condition, they received different goal instructions. The instructions were given to the two participants at the same time. These instructions were very close to those used in Darnon, Butera, and Harackiewicz

(2007; see also Darnon & Butera, 2007) for mastery goals and those used in Darnon, Harackiewicz, Butera, Mugny, and Quiamzade (2007) for performance-approach and performance-avoidance goals. In both articles, an ad hoc study showed that each selected instruction was effective in eliciting the targeted achievement goal. More specifically, it was shown that a mastery goal instruction condition significantly enhanced the endorsement of mastery goals as compared with performance-approach goal and no-instruction conditions; moreover, a performance-approach goal instruction condition significantly enhanced the endorsement of performance-approach goals as compared with mastery goal and no-instruction conditions (Darnon, Butera, & Harackiewicz, 2007). It was also shown that a performance-approach goal instruction condition significantly enhanced the endorsement of performance-approach goals as compared with performance-avoidance goal and no-instruction conditions; moreover, a performance-avoidance goal instruction condition significantly enhanced the endorsement of performance-avoidance goals as compared with performance-approach goal and no-instruction conditions (Darnon, Harackiewicz, et al., 2007). In sum, each goal instruction elicited the corresponding achievement goals to a significantly larger extent than the other goal instructions and a control condition in which the goal orientations existing in the sample were not experimentally influenced. In the present research, these instructions were adapted to the current task. More specifically, in the mastery goal condition, the instructions were as follows:

It is very important for you to accurately understand the aim of this experiment. You are here to acquire new knowledge. At the end of the task, you will be evaluated in order to know whether you personally learned in this experiment. Thus, your goal should be to progress all along the experiment. More specifically, you should try to acquire new knowledge that could be useful to you. In other words, what we ask you here is to learn.

In the performance-approach condition, participants heard the following instructions:

It is very important for you to accurately understand the aim of this experiment. You are here to be a performer and to demonstrate competence. At the end of the task, your competence will be evaluated compared to that of other students. Thus, your goal should be to have the result of this evaluation as good as possible. More specifically, 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 abilities.

In the performance-avoidance condition, participants heard the following instructions:

It is very important for you to accurately understand the aim of this experiment. You are here to avoid performing poorly. At the end of the task, your competence will be evaluated compared to that of other students. Thus, your goal should be to avoid the result of this evaluation to be negative. More specifically, 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 the control condition, no specific instructions were given.

After receiving the instructions, participants were given a brief description of the task. The bogus task consisted of identifying words based on three letters. This task was divided into two subtasks in order to make the instruction to progress throughout the experiment (i.e., from one subtask to the other) relevant to the mastery goal condition. To ensure that social comparison would be relevant in the present study, we also told participants that after completing these two tasks, they would be told the answers given by the other participant, which did not actually occur.

Before starting the second set, participants received written instructions reminding them of the goal induction. The two participants then completed the two sets of the word task in the same room and in the presence of the experimenter. After completing the second set, they reported the extent to which they were concerned with social comparison.

**Measures.** At the beginning of the experiment, mastery goals were measured. Then after the task completion, participants had to report their interest in social comparison.

**Mastery goals.** Mastery goal items were the same as those used in Study 1, namely, Elliot and McGregor's (2001) items (see Darnon & Butera, 2005, for the validation in French;  $\alpha = .81$ ,  $M = 5.04$ ,  $SD = 1.23$ ) adapted to the experimental context (e.g., "in this class" was replaced by "in this experiment").

**Interest in social comparison.** Because the SCO scale (Gibbons & Buunk, 1999) is not task-specific, it could not be used in the present experiment. We thus constructed four items designed to address interest in social comparison during a specific task. More specifically, participants were asked to indicate how much—thus far during the experiment—they wondered about their competence and that of the other participant, who between the two of them was the more competent, how the other person would do at the task compared with themselves, and how they compared in competence with the other participant. The scale ranged from 1 (*not at all*) to 7 (*very much*). This scale presented a good internal consistency ( $\alpha = .88$ ,  $M = 3.44$ ,  $SD = 1.5$ ).

**Initial ability.** To control for initial ability, we asked participants to report the mean grade obtained on the *baccalauréat* (cf. Study 1). This grade could range from 0 to 20 ( $M = 11.38$ ,  $SD = 1.54$ ).

## Results

**Overview of the analyses.** We conducted multiple regressions to analyze data. The main effect of goal instruction was decomposed in three orthogonal contrasts. The first contrast—the one relevant for testing the hypothesis—opposed the performance-approach goal condition (+3) to the three others (−1 each). The second contrast opposed the performance-avoidance goal condition (+2) to the mastery goal and control condition (both −1). The third contrast opposed the mastery goal condition (+1) to the control group (−1). Mastery goals as well as the interactions between mastery goals (created on the basis of the centered variables) and each contrast were also included in the model. Moreover, to control for initial ability, we entered the mean *baccalauréat* grade as a covariate. Because the covariate did not correlate with any of the independent variables, the interactions between the covariate and the independent variables were not included in the model (Muller, Yzerbyt, & Judd, 2008; Yzerbyt et al., 2004). Thus, the final regression model contained eight terms: the three con-

trasts of the manipulated goal conditions, self-set mastery goals, the interactions between mastery goals and each contrast, and the covariate. Interest in social comparison was regressed on the model.

**Achievement goals and social comparison.** Means, standard deviation, and simple slopes are presented in Table 2. The three contrasts significantly predicted interest in social comparison. The first contrast,  $B = 0.25$ ,  $F(1, 91) = 9.29$ ,  $p < .004$ ,  $\eta_p^2 = .09$ , indicated that the performance-approach goal condition led to more interest in social comparison than the three other conditions. The second contrast,  $B = 0.37$ ,  $F(1, 91) = 11.34$ ,  $p < .002$ ,  $\eta_p^2 = .11$ , indicated that the performance-avoidance condition led to greater interest in social comparison than the two other nonperformance conditions (mastery goals and control group). The significance of the third contrast,  $B = 0.39$ ,  $F(1, 91) = 4.23$ ,  $p < .05$ ,  $\eta_p^2 = .04$ , indicated that the mastery goal condition led to more interest in social comparison than the control group. The main effect of self-set mastery goals was also significant,  $B = 0.24$ ,  $F(1, 91) = 4.45$ ,  $p < .04$ ,  $\eta_p^2 = .05$ , indicating that the more participants endorsed mastery goals, the more they reported being concerned with interest in social comparison.

As expected, the interaction between the first contrast and mastery goals was significant,  $B = 0.18$ ,  $F(1, 91) = 7.95$ ,  $p < .006$ ,  $\eta_p^2 = .08$ , indicating that the relationship between mastery goals and interest in social comparison was greater in the performance-approach condition than in the other three conditions. As evident in Table 2, simple slopes indicated that mastery goals positively and significantly predicted interest in social comparison in the performance-approach condition,  $B = 0.77$ ,  $F(1, 91) = 12.89$ ,  $p < .001$ ,  $\eta_p^2 = .12$ , but not in the other conditions: respectively,  $B = -0.35$ ,  $F(1, 91) = 2.14$ ,  $p < .15$ , in the performance-avoidance condition;  $B = 0.29$ ,  $F(1, 91) = 2.00$ ,  $p < .17$ , in the mastery condition; and  $B = 0.24$ ,  $F(1, 91) < 1$ , in the control condition.

The interaction between the second contrast and mastery goals was also significant,  $B = -0.21$ ,  $F(1, 91) = 4.55$ ,  $p < .04$ ,  $\eta_p^2 = .05$ , but in the opposite direction. Indeed, mastery goals predicted more negatively interest in social comparison in the performance-avoidance condition than in the other two. The interaction between the third contrast and mastery goals was not significant,  $B = 0.03$ ,  $F(1, 91) < 1$ .

## Discussion

The first interesting result in Study 2 is the main effect of goals induction. Indeed, the significance of the first contrast indicated

that the performance-approach goal condition led to greater interest in social comparison than the three other goal conditions, which confirms the strong link between performance approach and the interest in social comparison. The significance of the second contrast indicated that performance-avoidance goals also led to greater interest in social comparison than the two other nonperformance conditions. In Study 1, although the interaction between performance-avoidance goals and performance-approach goals was significant, the main effect of performance-avoidance goals was not. However, as previously discussed, the items used in Study 1 did not explicitly refer to social comparison. In the present study, the performance-avoidance goal induction clearly referred to social comparison (e.g., “not to perform more poorly than others”). Thus, the present result supports our interpretation in terms of lack of direct reference to social comparison in the performance-avoidance goal items used in Study 1. The significance of the third contrast indicated that the mastery goal condition led to more interest in social comparison than the control group. This result is consistent with the main effect of mastery goals obtained in Study 1 and brings additional support to the idea that interest in social comparison is present in mastery goals. It is worth noting that in Régner et al. (2007), the link with SCO was far stronger for performance-approach than for mastery goals. In line with this result, the present study indicated that even if more interest in social comparison is obtained in the mastery condition than in the control condition, it still results in lower interest in social comparison than in the two performance goal conditions.<sup>4</sup>

More importantly, apart from the main effect of manipulated goals, the present study was designed to examine whether self-set mastery goals would predict interest in social comparison and whether this link would vary depending on the goal condition. First, the main effect of self-set mastery goals on interest in social comparison extends the results obtained by Régner et al. (2007) and those obtained in Study 1. Indeed, this result indicated that mastery goal endorsement predicts interest in social comparison not only in general but also on a more specific task. More importantly, in line with the hypotheses, the interaction indicated that mastery goals positively predict interest in social comparison more in the performance-approach goal condition than in the other three conditions. In other words, this result replicates the results obtained in Study 1 in an experimental context. It is worth noting that in the present study, a coactor was always present, which might have enhanced social comparison concerns in all four conditions. In spite of that, the interaction effect clearly indicates that mastery goals did not strongly predict interest in social comparison whatever the condition. Instead, this link is stronger in the performance-approach goal condition than in the other three conditions. This is consistent with recent research showing that the meaning and effects of social comparison depend on the context and in particular on whether this context challenges self-competence (Muller & Butera, 2007), as when performance-approach goals are activated.

Unexpectedly, results also indicated that the link between mastery goals and interest in social comparison varied in the perfor-

Table 2

*Interest in Social Comparison as a Function of Goal Condition and Level of Mastery Goal Endorsement (Study 2)*

Interest in social comparison	Control	Mastery	Performance avoidance	Performance approach
<i>M</i>	2.88	3.59	4.24	4.23
<i>SD</i>	1.09	1.55	1.56	1.38
<i>B</i> <sup>a</sup>	0.24	0.29	-0.35	0.77***

<sup>a</sup> The link between mastery goals and interest in social comparison.

\*\*\*  $p < .001$ .

<sup>4</sup> The differences between means across conditions were not directly tested because of the nature of the contrast chosen in this analytical strategy; however, as evident in Table 2, they all go in the described direction.

mance-avoidance condition compared with the control and mastery goal conditions. This suggests that not all performance goals positively link mastery goals to interest in social comparison; rather, only performance-approach goals do. A possible interpretation is that when mastery goals are associated to a performance-avoidance goal focus, social comparison becomes particularly threatening and participants tend to avoid it, compared with a situation in which a mastery goal focus or no particular focus was elicited. More research should be carried out to address this issue.

### General Discussion

In their recent article, Régner et al. (2007) demonstrated that both performance-approach and performance-avoidance goals as well as mastery goals were related to social comparison. In the present research, we wished to extend these findings by hypothesizing that goals could interact with one another in predicting social comparison. This is an important question, from both a theoretical and an empirical point of view, given that research on achievement goals has now fully demonstrated that very often in class students do not actually pursue “pure” goals but multiple goals and these goals can interact with one another (e.g., Barron & Harackiewicz, 2001). In the present two studies, it was argued that mastery goals would predict interest in social comparison more when associated with performance-approach goals (i.e., in the case of multiple-goal endorsement). In Study 1, this hypothesis was examined in a classroom setting, where the link between endorsed mastery goals and social comparison appeared to be moderated by self-set performance-approach goals. In Study 2, the hypothesis was examined in a laboratory setting, where the link between endorsed mastery goals and social comparison appeared to be moderated by manipulated performance-approach goals. Additional validity was brought by the fact that the social comparison measure used in Study 1 was a general dispositional orientation, whereas the one used in Study 2 was situation specific, and the results appeared to be consistent across the two studies.

Both studies indicated that performance-approach goals predicted social comparison concerns, which is consistent with the definition of goals used in the literature, which states that social comparison is a very important component of performance-approach goals (e.g., Ames, 1992; Dweck, 1986). In the same vein, performance-avoidance goals increased interest in social comparison. In Study 1, this occurred when performance-approach goals were low; this also occurred in Study 2, with a performance-avoidance goal induction that explicitly focused on social comparison. Moreover, the two studies showed a main effect of both measured and manipulated mastery goals. In both Study 1 and Study 2, self-set mastery goals significantly predicted SCO and interest in social comparison, respectively; in Study 2, the mastery goal condition led to greater interest in social comparison than the control condition. In line with the results obtained by Régner et al. (2007), this points to an important issue in the literature on achievement goals. Indeed, for years authors in this field have argued that when pursuing mastery goals, students are not concerned with social comparison issues (e.g., Dweck, 1986). The results of the present study bring further evidence for social comparison concerns in mastery goals (see also Butler, 1992, 1993, 1995).

However, more importantly, the present research revealed an interaction effect between mastery and performance-approach goals in predicting social comparison, providing for the first time in the literature information about the functional interplay between these two goals, over and above their main effects. It was argued that mastery goals would predict interest in social comparison more when associated with high performance-approach goals—namely, in the case of multiple-goal endorsement—than when associated with low performance-approach goals. The results of both studies supported this hypothesis. In Study 1, the higher the performance-approach goals, the stronger the link between mastery goals and SCO. In Study 2, the only condition in which mastery goals were significantly linked to interest in social comparison was the performance-approach condition. In other words, the link between mastery goals and interest in social comparison was significantly stronger when explicitly associated to performance-approach goals. These results support the idea that the pursuit of mastery goals when associated with high performance-approach goals is quite different from the pursuit of mastery goals without performance-approach goals. One might think that in the case of the pursuit of multiple goals, mastery goals might actually serve performance-approach goals (see Wentzel, 1991). In other words, one can search for mastery in order to reach performance goals (mastering the task in order to get better grades than others). This could explain why in this case—that is, when associated with a high level of performance-approach goal endorsement—mastery goals predict SCO or interest in social comparison.

Some limitations are worth mentioning. Given the low number of male participants, we could not test for gender effect in the present study. This would have been interesting given that, in Régner et al.’s (2007) study, an interaction was observed between sex and mastery goals, indicating that the link is significant for men but only marginal for women. It is interesting to note that in the present research, participants were mainly women—the gender for which the link between mastery goals and SCO was not clearly established in Régner et al.’s study. These results thus confirm that this link is not limited to male participants and reinforce in this sense the previous results. Moreover, the present sample is composed of adult participants. Even if the pattern is quite similar to the pattern obtained by Régner et al. on younger students, goals have been shown to change across time (Anderman, Austin, & Johnson, 2002), as does interest in social comparison (Butler, 2005; Nicholls, 1984). Future research will have to examine the stability of the link observed here across various ages and class level. Moreover, previous research (Butler, 1992, 1993) has shown that performance goal conditions promote concerns for self-assessment and self-enhancement, whereas mastery goals promote concern for self-assessment and self-improvement but not self-enhancement. Future research should examine whether mastery goals, associated to a strong performance goal focus (i.e., multiple goals), remain mainly focused on the informational function of social comparison but not on self-enhancement concerns.

Notwithstanding these limitations, the present results highlight important issues at both the methodological level and the practical level. On the methodological side, the present results point out the great potential of testing not only for main effects of goals but also for interactions between goals. As noted by Harackiewicz, Barron, Pintrich, et al. (2002), we do think that

testing the multiple goal perspective demands a different methodology than the one used in early goals research: It requires that we consider multiple outcomes and that we test the independent and interactive effects of mastery and performance-approach goals on each outcome. (p. 640)

We believe that the present research may contribute to encouraging achievement goal researchers to consider interaction terms when conducting regression analyses.

On a practical level, the present research specifies the link between mastery goals and social comparison and contributes to the understanding of what happens when students endorse multiple goals. Indeed, our results indicate that when associated with high performance-approach goal endorsement, mastery goals predict social comparison, which is not the case when they are not associated with such goals (i.e., in case of a strong mastery goal endorsement that is not associated to a strong performance-approach goal endorsement). Thus, the link between mastery goals and social comparison depends on the level of performance-approach goals. One of the reasons why multiple goals could be adaptive (see Barron & Harackiewicz, 2000) is that in the case of the pursuit of multiple goals, mastery goals actually serve performance goals. In other words, one's pursuit of mastery goals could be a step toward the pursuit of performance goals ("mastering more than others"). This question is critical and will have to be considered in future research. Indeed, mastering a task to get a good grade might be very different from mastering a task to get a better grade than others. Previous research has indicated that in a university context, both mastery and performance-approach goals are perceived as adaptive (as "socially useful"; cf. Darnon et al., 2009; see also Dompnier, Darnon, & Butera, 2009). This suggests that students consider that their achievement at university is determined by both a criterion-based assessment (reaching a certain level of achievement; i.e., the official assessment method) and a norm-referenced selection system (being better than others; i.e., the actual functioning of selection at university). If the above reasoning is correct in suggesting that one type of goals might serve the other, it seems reasonable to think that multiple-goal students could show an adaptive pattern because performance is achieved via mastery and not via other strategies, such as cheating (Murdock & Anderman, 2006), exploitation of others (Poortvliet, Janssen, Van Yperen, & Van de Vliert, 2007), or surface processing (Nolen, 1988). This would be consistent with findings by Elliot, McGregor, and Gable (1999), namely, that effort and persistence can be the mediators of the link between performance-approach goals and exam grades; perhaps in this study, the participating students actually pursued multiple goals. This would also be consistent with Ng's (2006) finding that multiple-goal students are those who use deep strategies the most, and with Steinberg et al.'s (2000) finding that, in a sports-related task, the students assigned to the multiple-goal condition were those who showed the greatest enhancement in efforts and those who trained the most. Future research will have to explore in greater detail this possibility by, for example, testing mastery goals as a mediator of the positive effect of multiple goals on performance. If this reasoning is correct, then important guidelines for practice can be underlined. Indeed, many authors have observed that it is particularly difficult to make schools and other educational structures free from performance goals (e.g., Urdan, 2004; Urdan & Turner, 2005). If it is so hard to make performance

goals disappear from students' concerns, perhaps in the meanwhile one could lead students to pursue both types of goals and, more precisely, to convince them to achieve performance via mastery and not via other maladaptive (e.g., surface processing) or dishonest processes (e.g., cheating).

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