Motiv Emot (2006) 30:335–345
DOI 10.1007/s11031-006-9039-4

ORIGINAL PAPER

The Effects of Social-Comparison Versus Mastery Praise on Children's Intrinsic Motivation

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Received: 22 January 2006 / Accepted: 4 August 2006 / Published online: 25 August 2006

Abstract Two studies examined the effects of social-comparison versus mastery praise on 4th- and 5th-grade children's intrinsic motivation. Children received a high score and either social-comparison praise, mastery praise, or no praise for working on a set of novel puzzles. They then worked on a different task and were given either ambiguous feedback (Study 1) or positive feedback (Study 2) before completing measures of intrinsic motivation. Mastery praise enhanced intrinsic motivation and social-comparison praise curtailed it when uncertainty about children's subsequent performance was introduced (Study 1) and, for girls, even in situations of continued success (Study 2). Social-comparison praise also tended to discourage children from seeking subsequent self-evaluative normative information. Theoretical and practical implications are discussed.

Keywords Intrinsic motivation · Praise · Social Comparison · Mastery · Gender

What student would not want to hear that she has completed a task more accurately, quickly, or effectively than her peers? What more effusive way for a teacher to praise a spectacular achievement than by contrasting it with the achievements of others? Conventional wisdom suggests that there is no higher praise than normative superiority. Of course, there are other ways to express approval or to convey competence. Rather than praising students for excellence relative to others, educators instead might focus on the mastery of new skills or the depth of understanding. How might these different types of praise affect subsequent motivation?

The motivational consequences of different dimensions of praise–such as these–have been the subject of a growing body of research (see Henderlong & Lepper, 2002). This work has shown, for example, that praise fosters intrinsic motivation and adaptive behaviors to a greater extent when it is perceived as informational as opposed to controlling (Deci & Ryan, 1985; Ryan, Mims, & Koestner, 1983), and when it is focused on underlying processes rather than traits, especially when children are subsequently confronted with challenging tasks (Mueller & Dweck, 1998). However, little research has contrasted praise for normative excellence with praise for task mastery. Such investigations would be theoretically as well as practically significant given the prevalence of normative comparisons in educational contexts (see Levine, 1983). A primary goal of the present investigation, therefore, was to assess the effects of social-comparison versus mastery praise on children's intrinsic motivation.

Potential benefits of social-comparison praise

Praising children for their achievements using a normative framework could potentially be quite motivating. As Festinger (1954) long ago noted, individuals seek to reduce uncertainty and to accurately evaluate their own abilities through social comparison. Observing where one stands in relation to others can in fact be a diagnostic source of

Funding for this research was provided by the office of the Dean of Faculty at Reed College. We would like to thank Tracy Tomlinson, Penelope Stanton, and Annie Block for their assistance with data collection and Kathy Oleson for feedback on a previous draft of this article. We are grateful to the Portland Public Schools' Research and Evaluation Department for their support and, of course, to the children who participated in this research.

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information about ability (Campbell, Fairey, & Fehr, 1986; Ruble & Frey, 1991)—one that is greeted more favorably when it indicates superiority as opposed to inferiority (Butler, 2000; Levine & Green, 1984; Suls & Miller, 1977). Beyond accurate self-evaluation, individuals also strategically engage in social comparison to bolster their self-perceptions, achieve task mastery, and clarify performance standards (Butler, 1992; Pomerantz, Ruble, Frey, & Gruelich, 1995; Ruble & Frey, 1991; Wood, 1989). Social-comparison praise, therefore, could communicate information that is both diagnostic and self-enhancing. But, would this necessarily benefit intrinsic motivation?

If social-comparison praise elevates perceptions of competence, then a boost to intrinsic motivation should follow. According to both classic theoretical accounts of intrinsic motivation (Deci & Ryan, 1980; Harter, 1978; White, 1959) and current empirical research on mediating processes (Elliot *et al*., 2000; Grouzet, Vallerand, Thill, & Provencher, 2004; Reeve & Deci, 1996; Sansone, 1989) perceived competence is an important source of intrinsic motivation (see also Elliot & Dweck, 2005). For example, in a study with college students, Elliot *et al*. (2000, Study 1) manipulated the valence of feedback for a laboratory task and subsequently measured students' competence valuation, perceived competence, and self-reported intrinsic motivation. Compared to negative feedback, positive feedback enhanced both competence valuation and perceived competence, which, in turn, enhanced intrinsic motivation.

Perhaps the most direct evidence that social-comparison praise could enhance intrinsic motivation comes from the praise literature itself. Students told that they have done "better than average" (Deci, 1971; Harackiewicz, 1979), that their work is "among the best" (Pretty & Seligman, 1984), or that they have achieved a solution more quickly than others (Blanck, Reis, & Jackson, 1984; Shanab, Peterson, Dargahi, & Deroian, 1981) show higher levels of intrinsic motivation across a variety of measures compared to students in no-praise control groups or other comparison conditions. In one of the few studies conducted with children, Sarafino, Russo, Barker, Consentino, and Titus (1982) asked fourth-grade students to create funny endings to a series of riddles and then gave them either social-comparison praise or feedback that they had performed similarly to others. Children who received social-comparison praise selected more riddles to complete at the end of the session than those who received average feedback.

Although these studies suggest that social-comparison praise may enhance intrinsic motivation, they are not without their limitations. First, additional comparison groups are often necessary. In the Sarafino *et al*. (1982) study, social-comparison praise was contrasted with feedback indicating that children were average, which may have been discouraging for some high-achieving children. Why not, instead, contrast social-comparison praise with objective feedback (e.g., number correct) or, perhaps more interestingly, praise that comments on improvement over trials? Second, very few studies employing statements of social-comparison praise have been conducted with children. Because there are substantive developments in children's use of social-comparison information over the first decade of life (see Ruble, Boggiano, Feldman, & Loebl, 1980; Ruble & Frey, 1991), it is important to pursue this area of research with child populations. Finally, across virtually all studies of social-comparison praise, dependent measures have been collected immediately following the praise induction when participants only have reason to feel good about their performance. It is essential that we examine the effects of social-comparison praise on intrinsic motivation following a subsequent experience of challenge or uncertainty given that these conditions more closely approximate children's experiences in real-world settings. Social-comparison praise may have short-term benefits but long-term costs for children's beliefs and behaviors in the face of such difficulties (see Henderlong & Lepper, 2002). We consider this possibility in the next section.

Potential costs of social-comparison praise

A key concern with the broad application of social-comparison praise is that it may encourage children to evaluate themselves largely based on how they perform relative to others, in which case, "they may not be well-equipped to deal with later situations in which others show superior performance" (Henderlong & Lepper, 2002, p. 785). A focus on normative comparison may also prevent children from enjoying the learning process and achieving to their potential (see Brickman & Bulman, 1977; Kohn, 1992). Indeed, even the winners of interpersonal competitions tend to experience a reduction in intrinsic motivation because competition itself leads them to feel that their behaviors are externally controlled (Deci, Betley, Kahle, Abrams, & Porac, 1981; Deci & Ryan, 1985; cf. Butler, 1989).

Several additional lines of research suggest that a normative focus can be detrimental. Children who received normative grades for their performance on a laboratory task exerted effort primarily in order to do better than others and subsequently indicated lower levels of task interest than those who received task-focused comments (Butler, 1987). This pattern of findings held for both low- and high-achieving children, although normative feedback may be particularly harmful for low-achieving children. Indeed, in a classroom-based study, low-achieving children, but not high-achieving children, showed less motivation for improvement when they were given written feedback on exams that compared their performance to others as opposed to an objective standard (Krampen, 1987). Finally, a normative focus may be harmful

in that the frequency with which children consult their peers' work has been linked to less optimistic self-views (Ruble & Frey, 1987) and lower levels of intrinsic motivation (Butler, 1989).

A vast literature on students' competence-related goals in the classroom has similarly demonstrated that a focus on normative comparison can be harmful to motivation. Researchers have contrasted "performance goals" that involve a focus on demonstrating competence by outperforming others, with "mastery goals" that involve a focus on increasing competence by developing skills (Ames, 1992; Dweck, 1986; Nicholls, 1984). Mastery goals have been associated with a host of positive achievement outcomes such as persistence, self-efficacy, effective learning strategies, and intrinsic motivation (Ames, 1992; Dweck, 1999; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Pintrich, 2000; Rawsthorne & Elliot, 1999). Performance goals, on the other hand, have traditionally been associated with more negative outcomes such as learned helplessness, negative affect, superficial learning strategies, challenge avoidance, and self-handicapping (Ames, 1992; Dweck, 1999; Midgley & Urdan, 2001; Pintrich, 2000). In recent years, a multiple goals perspective has emerged that casts doubt on a uniformly negative view of performance goals, especially in the college classroom where such goals positively predict course grades (Elliot & McGregor, 2001; Harackiewicz, Barron, & Elliot, 1998; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). Notwithstanding this debate, investigators agree on the adaptive value of mastery goals (see Linnenbrink, 2005; Midgley, 2002; Pintrich, 2000) and some continue to argue that performance goals may be maladaptive for children (Midgley, Kaplan, & Middleton, 2001). Thus, to the extent that goals highlighting individual task mastery are adaptive, and that goals highlighting interpersonal comparisons have the potential to be maladaptive, mastery praise may facilitate intrinsic motivation to a greater degree than social-comparison praise.

Social-comparison versus mastery praise

To our knowledge, only one study has directly compared the effects of social-comparison versus mastery praise on intrinsic motivation. Using a laboratory paradigm with adults, Koestner, Zuckerman, and Olsson (1990) delivered social-comparison or mastery praise for a puzzle-solving task and then assessed intrinsic motivation. They found that the effects of praise on motivation were moderated by several individual difference variables, including gender. Relative to mastery praise, social-comparison praise tended to undermine intrinsic motivation for women but to enhance intrinsic motivation for men, perhaps because of traditional socialization practices that lead men and women to be comfortable with different types of feedback (e.g., Deci & Ryan, 1985). Without a no-praise control group, however, it is not clear whether social-comparison praise, mastery praise, or some combination of both were driving the effects. Nonetheless, their findings suggest that social-comparison praise may be detrimental for females but not males.

Although the Koestner *et al*. (1990) study is intriguing, it is difficult to know precisely how it informs the present analysis. First, the participants were adults who may react differently to being praised by an experimenter than would children who are arguably less suspicious and more accustomed to receiving praise for their everyday work in the classroom. Second, and perhaps more importantly, the participants in the study were faced only with a situation of clear success. Following the praise induction, there was no subsequent challenge to their performance or ability–a critical condition for testing the motivating properties of any situational variable. One might imagine that, under such conditions of challenge, the potential costs of social-comparison praise outlined above would become evident for both males and females.

The present research is the first to provide a direct comparison of the relative benefits of social-comparison versus mastery praise among children and beyond a context of clear success. In Study 1, we presented children with an ambiguous situation following the praise induction in order to examine the effects of praise after they were no longer certain of their normative standing. We hypothesized that both boys and girls given social-comparison praise would subsequently show less intrinsic motivation than those given mastery praise or no praise. We removed this ambiguity in Study 2 in order to conceptually replicate Koestner *et al*. (1990) and examine the effects of praise in a situation of clear success. Under these more favorable conditions, we hypothesized that the negative effects of social-comparison praise would be eliminated for boys, but not girls. Previous studies have found that boys tend to be more interested than girls in social-comparison information (Butler, 2000; Ruble, Feldman, & Boggiano, 1976) and that males are more motivated than females by interpersonal competition (Deci *et al*., 1981). In the unambiguously successful context of Study 2, therefore, we expected social-comparison praise to be motivating for boys. Finally, we assessed children's information-seeking behaviors in Study 1 to determine what effect, if any, the praise manipulation would have on their desire for information about the performance of their peers. Specifically, we assessed children's tendency to seek comparative information that would help them either to evaluate their performance or to improve it–two key goals that guide social comparisons in achievement contexts (see Butler, 1992; Wood, 1989). We speculated that social-comparison and mastery praise might encourage different levels of interest in self-evaluation versus self-improvement.

Study 1

Method

Participants

The sample included 86 upper-elementary children (51 girls, 35 boys; *M* age = 10.92 years, *SD* = .69), the majority of whom were European Americans. Recruitment letters were sent home to the parents of fourth- and fifth-grade students at six schools (two public, four parochial) in the late spring. Children with parent permission came to a campus laboratory to participate during the summer, at which time they provided their own written assent. They were compensated with a $10 gift certificate for one of several local stores.

Procedure

Children were individually tested by one of two female experimenters, both of whom were blind to hypotheses. The entire procedure was videotaped from behind a one-way mirror; parents but not children were aware of the videotaping prior to the study.

The experiment began with a set of practice questions designed to teach children how to use a Likert-scale response system. Next, children were asked to complete two sets of puzzles, each containing 5 Standard Progressive Matrices (Raven, 1976). The puzzles were selected to be moderately easy to ensure that children would answer most of the items correctly within a 3-minute time limit. Children were given a score for each set of puzzles, with the constraint that all children were told they answered at least four of the five correctly on each set.

Thirty children (18 girls, 12 boys) were randomly assigned to receive social-comparison praise for their work. Following the first set of puzzles, these children were told, "That's great work! You seem to be better at this than most kids!" Following the second set of puzzles, they were told, "Nice job! Most kids don't do as well as that!" Finally, after looking at children's scores across both sets of puzzles, the experimenter said, "That's among the best work I've seen from someone your age!," and she wrote a statement of social-comparison praise (e.g., "Top of the class!") at the top of children's answer sheets. Another 32 children (19 girls, 13 boys) were randomly assigned to receive mastery praise for their work. Following the first set of puzzles, these children were told, "That's great work! You seem to really be getting the hang of it!" Following the second set of puzzles, they were told, "Nice job! You've really learned how to solve these!" Finally, after looking at children's scores across both sets of puzzles, the experimenter said, "You've really become an expert at these!," and she wrote a statement of mastery praise (e.g., "Super solving!") at the top of children's answer sheets. Finally, 24 children (14 girls, 10 boys) were randomly assigned to the control group. These children received a score but no additional feedback on their work.

Children next completed two brief items about their experience with the puzzles. To assess task-specific motivation, they were asked "How much did you like working on the pattern puzzles?" To assess task-specific perceived competence, they were asked, "How good of a job did you do on the pattern puzzles?" Responses were made using seven-point scales.

Children were then asked to work on a task that required them to create pictures from a page of empty circles (Torrance, 1966; see also Butler, 1992). The experimenter explained that they would have six minutes to draw as many pictures as they could, using one or more circles for each picture. She then moved to a different table and busied herself by looking through a stack of papers. At the end of the six-minute period, the experimenter neither scored nor commented on children's drawings. She simply asked them to complete two brief items assessing task-specific motivation and perceived competence for the drawing task. The same two items used earlier for the puzzle task were adapted for this purpose.

The experimenter then explained that she had additional tasks and questions for children to complete, but that she had run out of copies and would need to go make more. In the meantime, she directed children to three different activity stations that would provide them with more information about the drawing task. Stations were presented to children in a counterbalanced order and the following descriptive explanations were given (see Butler, 1992):

> (1) This station is called "Ideas for Circle Drawings" and in here you can find some examples of completed circles worksheets. There are also instructions and a worksheet to help you learn some things and get some new ideas. (2) This station is called "My Creative Ability Compared to Other Students" and, at this station, you can find instructions and a worksheet that will help you figure out your creative score and you can see how that compares to other students' scores. (3) This station is called "My Personal Creative Style" and, at this station, you can find instructions and a worksheet that will help you find out what your personal creative style is based on the circles worksheet.

Each station contained a binder with drawings that ostensibly had been done by same-aged peers as well as a worksheet that supported the intended function of the station. Thus, each station provided the opportunity for social comparison but the underlying function of the comparison differed (e.g., self-improvement versus self-evaluation). The experimenter told children that it would take about five minutes for her to prepare the final materials and that they

could explore as many of the stations as they wanted in any order. She then left the room for five minutes. Children's information-seeking behaviors were recorded with a video camera placed behind a one-way mirror. A research assistant blind to the experimental condition of each participant later watched the videotapes and recorded the amount of time children spent at each station.

The experimenter administered the central dependent measures of intrinsic motivation upon her return. First, children were asked to complete a 9-item self-report measure of intrinsic motivation drawn from Lepper, Corpus, and Iyengar's (2005) 17-item measure (split-half reliability = .81). Using five-point scales, children indicated their agreement with items representing the dimensions of challenge (e.g., "I like hard work because it's a challenge"), curiosity (e.g., "I read things because I am interested in the subject"), and independent mastery (e.g., "I like to do my schoolwork without help"); $\alpha = .79$. Second, children were presented with a task that required them to create pictures from a page of parallel lines, similar to the previous circle task (Torrance, 1966). As a behavioral measure of intrinsic motivation, children were asked to select either a half-sheet or a whole sheet of lines. Our assumption was that selecting a longer and more challenging task (i.e., the whole sheet of lines) would indicate greater intrinsic motivation. Once children made their selection, the experimenter glanced at a clock and noted that they would not have time to complete the task.

As a manipulation check, the experimenter asked children to recall what she had said to them about their earlier performance on the puzzle task. Children were then debriefed. The experimenter told them that they had been videotaped and gave them the opportunity to have their tape erased. No children appeared bothered by the videotaping. After receiving their gift certificate, children were escorted to a waiting room and reunited with their parents.

Results

Each of the continuous dependent measures was analyzed with a 3 (Feedback Condition) × 2 (Gender) analysis of variance (ANOVA). Because there were no interactions involving gender, data were collapsed across boys and girls and one-way ANOVAs with three levels (social-comparison praise, mastery praise, control condition) were conducted.

Preliminary analyses

Manipulation check. Children were credited with passing the manipulation check if a blind rater could confidently guess their assigned feedback condition based on their verbatim response. Based on this criterion, 92% of the sample remembered what the experimenter had said to them following the first set of puzzles. More children in the social-comparison praise (97%) and control (100%) conditions passed the manipulation check than those in the mastery praise condition (81%), $\chi^2(2, N = 86) = 8.87, p < .05$. Most generally, however, children appeared to have heard and processed the experimental manipulation. Because the patterns of findings and significance levels were unchanged by removing children who did not pass the manipulation check, the findings reported below include the entire sample.

Puzzle performance. Because all children were told that they answered at least 80% of the puzzles correctly, their actual performance was examined to ensure that such positive feedback would have been believable. Children did indeed perform quite well on both the first ($M = 77.90\%$ correct, $SD = 18.41$) and second ($M = 90.93\%$ correct, $SD = 13.94$) sets of puzzles. Additionally, there were no differences across experimental conditions for either set, Fs(2, 83) < 1.5, ns. This suggests both that there were no pre-existing differences in ability level among the randomly assigned groups and that the feedback manipulation did not affect task performance.

Task-specific questions

There were no differences by condition in task-specific motivation or task-specific perceived competence for either the puzzle or drawing task, Fs(2, 83) < 1, ns, but children reported higher overall motivation and perceived competence for the puzzle task ($M_{\text{motivation}} = 5.70$, $SD = 1.02$; $M_{\text{competence}} = 6.01$, $SD = .74$) than for the drawing task ($M_{\text{motivation}} = 4.92$, $SD = 1.40$; $M_{\text{competence}} = 4.07$, $SD = 1.24$), ts(85) > 4.90, ps < .001. Children arguably liked and felt more competent at the puzzle task than the drawing task because they were given positive feedback about their performance on the former but not the latter. Children also may have favored the puzzle task, in part, because a successful performance was more self-evident and objectively defined than it was for the drawing task.

Information-seeking behavior

A log transformation was performed on the amount of time children spent at each station in order to equalize variances. Analyses were then conducted using the transformed data for the two most theoretically meaningful stations: (1) *Ideas for Circle Drawings* because it provided an opportunity for self-improvement and (2) *My Creative Ability Compared to Other Students* because it provided an opportunity for self-evaluation. There was no effect of feedback condition on time spent at the ideas station, $F(2, 82) = 1.60$, ns, but there was a significant effect of condition on time spent at the creative

ability station, $F(2, 82) = 3.31$, $p < .05$, $\eta_p^2 = .08$.[1] Children in the mastery praise condition ($M_{untransformed} = 122.94$ sec., $SD = 115.31$; $M_{transformed} = 3.46$, $SD = 2.37$) spent the most time at the creative ability station, followed closely by those in the control condition ($M_{untransformed} = 107.71$ sec., $SD = 109.79$; $M_{transformed} = 3.23$, $SD = 2.43$), and rather distantly by those in the social-comparison praise condition ($M_{untransformed} = 60.65$ sec., $SD = 93.14$; $M_{transformed} = 1.96$, $SD = 2.44$). Tukey comparisons revealed a significant difference ($p < .05$) between the mastery and social-comparison praise conditions.

Intrinsic motivation

Self-reported intrinsic motivation. As predicted, there was a significant effect of feedback condition on children's self-reported intrinsic motivation, $F(2, 83) = 3.26$, $p < .05$, $\eta_p^2 = .07$. Children in the mastery praise condition ($M = 3.86$, $SD = .57$) reported the highest levels of intrinsic motivation followed by those in the control condition ($M = 3.66$, $SD = .58$) and finally by those in the social-comparison praise condition ($M = 3.49$, $SD = .54$). Tukey comparisons revealed a significant difference ($p < .05$) between the mastery and social-comparison conditions.

Behavioral intrinsic motivation. A chi-square test revealed a significant effect of feedback condition on children's selection of either a half-sheet or whole sheet of lines, $\chi^2(2, N = 86) = 8.92$, $p < .05$. As predicted, more children in the mastery praise condition (63%) selected the whole sheet than in the social-comparison praise condition (30%). Children in the control condition (29%) did not differ from those in the social-comparison praise condition. These findings are similar to those for self-reported motivation, although the self-report and behavioral measures were positively but not significantly inter-correlated, $r = .09$.

Discussion

There were no differences by condition on the measures of task-specific motivation or perceived competence[2] but there was a clear effect of feedback on intrinsic motivation. Mastery praise bolstered intrinsic motivation to a greater extent than social-comparison praise, which was arguably worse than no praise at all. By its very nature, social-comparison praise heightened the importance of one's normative standing–an effect that is inimical to intrinsic motivation (see Butler, 1987; Deci & Ryan, 1985; Kohn, 1992). Once children were led to doubt the quality of their subsequent performance, this normative focus became measurably harmful. Mastery praise, by contrast, focused children's attention on building competence rather than proving it. This afforded continued enjoyment of the learning process in the face of ambiguous information about competence. Thus, we believe two key factors were responsible for the negative effects of social-comparison versus mastery praise in the present study: (1) the normative focus inherent in social-comparison praise and (2) the introduction of uncertainty about subsequent performance.

Social-comparison praise also led children to avoid self-evaluative information. Children spent less time at the creative ability station when they had received social-comparison praise as opposed to mastery praise or neutral feedback. Using a similar paradigm, Butler (1992) found that a normative goal induction led children to spend *more* time at a scoring station than a station that afforded self-improvement. The difference between the present findings and those of Butler (1992) arguably lies in the uncertainty created about children's performance in the present study. As Brickman and Bulman argued, "If people are for any reason self-conscious, anxious, or just sensitive about their own position in a group, we might expect them to be especially interested in avoiding potentially unfavorable comparisons" (1977, p. 160). Indeed, a number of studies have shown that individuals actively avoid normative information in order to protect the self when their performance is suboptimal (Butler, 1992; Levine & Green, 1984; Ruble & Frey, 1991).

We have seen, then, that social-comparison praise has a detrimental effect on children's motivation in the face of uncertainty about the quality of their subsequent achievements. Why do the present findings differ from those of Koestner *et al.* (1990), who found social-comparison praise to be harmful only for women? Again, the difference arguably lies in participants' post-praise experiences. Whereas children in the present study were faced with uncertainty about their subsequent achievements, participants in the Koestner *et al.* study experienced unambiguous success. Perhaps females are susceptible to the negative effects of social-comparison praise across a variety of contexts. Males, on the other hand, may favor social-comparison information in contexts of success like Koestner *et al.*'s (see Butler, 2000; Ruble *et al.*, 1976), but not when subsequently confronted with ambiguous feedback. We removed this ambiguity in Study 2 in order to conceptually replicate Koestner *et al.* with a population of children and to examine the effects of praise in a situation of unambiguous success. In this context, we expected the negative effects of social-comparison praise to be eliminated for boys but not for girls.

[1] For this and subsequent analyses, one data point is occasionally missing because of experimenter error or children's off-task behavior.

[2] That the feedback manipulations did not affect these task-specific variables may be due, in part, to our use of single-item measures of unknown reliability and validity.

Study 2

Method

Participants

The sample included 78 upper-elementary children (35 girls, 43 boys; *M* age = 10.64 years, *SD* = .53) who were randomly assigned to receive social-comparison praise ($n = 26$, 12 girls, 14 boys), mastery praise ($n = 26$, 11 girls, 15 boys), or neutral feedback ($n = 26$, 12 girls, 14 boys). Recruitment procedures were the same as in Study 1.

Procedure

The procedure was identical to that of Study 1 with two exceptions that were intended to provide children with positive feedback about their performance on the drawing task. First, the experimenter marked children's drawings with a score of 22 points and stated, "That's a really good score. That gets a rating of 'Great'!" Second, rather than exploring the stations during the experimenter's absence, children looked through a binder of drawings that were marked such that 22 points was among the highest scores given. Thus, in contrast to Study 1, children in Study 2 were given unambiguous feedback that their performance on the drawing task was quite good.

Results

Each of the continuous dependent measures was analyzed with a 3 (Feedback Condition) × 2 (Gender) analysis of variance (ANOVA). For measures on which there were no interactions with gender, data were collapsed across boys and girls and one-way ANOVAs with three levels (social-comparison praise, mastery praise, control condition) were conducted.

Preliminary analyses

Manipulation check. As in Study 1, most children (93%) remembered what the experimenter had said to them following the first set of puzzles. There was a marginally significant effect of condition such that more children in the mastery praise (96%) and control (100%) conditions passed the manipulation check than those in the social-comparison praise condition (84%), $\chi^2\,(2, N = 76) = 5.71, p < .10$. Because the patterns of findings and significance levels were unchanged by removing children who did not pass the manipulation check, the findings reported below include the entire sample.

Puzzle performance. Like Study 1, children performed reasonably well on both the first ($M = 73.08\%$ correct, $SD = 22.53$) and second ($M = 86.92\%$ correct, $SD = 18.46$) sets of puzzles. There were no differences across conditions for either set, Fs(2, 75) < 1.8, ns.

Task-specific questions

There were no differences by condition in task-specific motivation or task-specific perceived competence for either the puzzle or drawing task, Fs(2, 75) < 2.4, ns, but children reported higher overall motivation and perceived competence for the puzzle task ($M_{\text{motivation}} = 5.53$, $SD = 1.13$; $M_{\text{competence}} = 4.97$, $SD = 1.24$) than for the drawing task ($M_{\text{motivation}} = 5.17$, $SD = 1.19$; $M_{\text{competence}} = 4.41$, $SD = 1.19$), ts(77) ≥ 2.00, ps ≤ .05. In order to determine whether the positive feedback for the drawing task was effective, children's ratings of perceived competence for the drawing tasks in Studies 1 and 2 were combined and subjected to a 2 (Study) × 2 (Gender) ANOVA. As predicted, children in Study 2 reported higher perceived competence than those in Study 1, $F(1, 160) = 3.82$, $p = .05$, $\eta_p^2 = .02$. The unambiguous feedback that children in Study 2 performed well on the drawing task, therefore, was at least moderately effective.

Intrinsic motivation

Self-reported intrinsic motivation. Unlike Study 1, there was no main effect of feedback condition on children's self-reported intrinsic motivation, $F(2, 71) = .20$, ns. There was, however, a significant interaction between condition and gender, $F(2, 71) = 9.08$, $p < .01$, $\eta_p^2 = .20$. The means displayed in the upper half of Table 1 suggest that, when children were assured of their good performance on the drawing task, social-comparison praise was beneficial for boys but harmful for girls. Indeed, analyses done separately by gender revealed that boys reported more intrinsic motivation in the social-comparison praise condition than in the mastery praise or control conditions, $F(2, 39) = 7.30$, $p < .05$, $\eta_p^2 = .27$. By contrast, there was a trend for girls to report less intrinsic motivation in the social-comparison praise condition than the control condition, $F(2, 32) = 2.70$, $p < .10$, $\eta_p^2 = .15$.

Taken together, the findings on self-reported intrinsic motivation from Study 1 and Study 2 suggest that there are gender differences in children's reactions to social-comparison praise only under limited circumstances. Social-comparison praise appears to be harmful to the intrinsic motivation of both boys and girls when they are subsequently given reason to question their competence, as in Study 1. When children are subsequently reassured of their competence, however, prior social-comparison praise appears to be harmful to the intrinsic motivation of girls but not boys (see Koestner *et al*., 1990). In order to test this interpretation more directly, the data on self-reported intrinsic motivation from Studies 1 and 2 were combined and subjected to a 3 (Feedback

Table 1 Self-reported and behavioral intrinsic motivation by feedback condition and gender for study 2

	Self-reported intrinsic motivation								
	Social-comparison praise			Mastery praise			Control		
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
Boys	4.21	0.41	13	3.81	0.32	15	3.63	0.43	14
Girls	3.60	0.42	12	3.88	0.54	11	4.04	0.43	12
	Behavioral intrinsic motivation (% Selecting whole sheet)								
	Social-comparison praise			Mastery praise			Control		
	%		*n*	%		*n*	%		*n*
Boys	71		14	57		14	50		14
Girls	50		12	64		11	92		12

Condition) × 2 (Gender) × 2 (Study) ANOVA. As one would expect, the three-way interaction between condition, gender, and study was significant, $F(2,\ 151) = 8.68$, $p < .001$, $\eta_p^2 = .10$. There also was a significant two-way interaction between condition and study, $F(2,\ 151) = 3.03$, $p = .05$, $\eta_p^2 = .04$, which confirmed that there was a difference across experimental conditions in Study 1 but not Study 2. Finally, there was a main effect of study, $F(1,151) = 4.75$, $p < .05$, $\eta_p^2 = .03$, such that children reported higher levels of intrinsic motivation in Study 2, presumably because they received positive feedback for the drawing task in Study 2 but not Study 1.

Behavioral intrinsic motivation. Because of the interaction between condition and gender for self-reported intrinsic motivation, logistic regression was used to test for both main effects and interactions on the behavioral measure. There was no main effect of feedback condition on children's selection of either a half-sheet or whole sheet of lines, Wald $\chi^2(2, N = 77) = 1.36$, ns, but there was a marginally significant omnibus two-way interaction between condition and gender, Wald $\chi^2(2, N = 77) = 5.34, p < .10$, and, importantly, a significant interaction between gender and the variable comparing social-comparison praise to the control condition, Wald $\chi^2(1, N = 77) = 5.33, p < .05$, odds ratio = .036. The percentages displayed in the lower half of Table 1 suggest that girls were less likely, but boys were more likely, to select the whole sheet of lines in the social-comparison praise condition than in the control condition. Estimating odds ratios separately by gender revealed a significant effect of social-comparison praise relative to the control condition for girls, Wald $\chi^2(1, N = 35) = 4.04, p < .05$, odds ratio = .09, but not boys, Wald $\chi^2(1, \mathrm{N} = 43) = 1.32$, ns, odds ratio = 2.5. The variable comparing mastery praise to the control condition did not interact significantly with gender. Thus, findings were similar to those for self-reported motivation, which was significantly correlated with the behavioral measure, $r = .37, p < .01$.

As argued above, these findings suggest that gender differences in children's reactions to social-comparison versus mastery praise emerge only when children are tested in a context of unambiguous success. In order to test this interpretation more directly, the data on children's behavioral intrinsic motivation from Studies 1 and 2 were combined and subjected to a binary logistic regression with condition, gender, and study as predictor variables. The three-way interaction was not significant, but there was a significant interaction between condition and study, which confirmed that there was a difference across experimental conditions in Study 1 but not Study 2. Specifically, the omnibus two-way interaction between condition and study was marginally significant, Wald $\chi^2(2, N = 162) = 5.58, p < .10$, and the interaction between study and the variable comparing mastery praise to the control condition was significant, Wald $\chi^2(1, N = 162) = 4.26, p < .05$, odds ratio = .15. Children who received mastery praise displayed more intrinsic motivation than those in the control group in Study 1 but not Study 2. Finally, there was a significant main effect of study, Wald $\chi^2(1, N = 162) = 7.43, p < .01$, odds ratio = 5.42, which indicated more intrinsic motivation in Study 2 than Study 1, presumably because children received a positive response to their drawings in Study 2 but an ambiguous response in Study 1.

General discussion

Taken together, these studies show that praise can have both beneficial and detrimental effects on children's intrinsic motivation depending on the type of praise, the context in which it is delivered, and the gender of the recipient (see also Deci & Ryan, 1985; Henderlong & Lepper, 2002; Koestner *et al*., 1990). When children were led to feel uncertain about their performance on the drawing task, the type of praise given for the earlier puzzle task had a main effect on intrinsic motivation: mastery praise proved beneficial and social-comparison praise proved detrimental. When success on the drawing task was assured, however, type of praise no longer had a main effect on intrinsic motivation. In this context of success, there was a significant interaction between type of praise and gender of recipient: social-comparison praise proved detrimental for girls but beneficial for boys, whose desire to outperform others was presumably well-served by the unambiguous positive feedback (see Deci *et al*., 1981). This interaction pattern

is consistent with a number of studies that have shown boys to be less vulnerable than girls to the negative effects of praise, perhaps due to socialization experiences that lead them to view feedback as an endorsement of their competence rather than a statement about expectations they feel pressure to meet (see Deci & Ryan, 1985; Henderlong & Lepper, 2002; Kast & Connor, 1988; Koestner *et al*., 1990). Identifying the precise mechanism underlying these gender differences is an important issue for future research.

Practical implications

What are the practical implications of these findings? As previous researchers have noted, there is both "pleasure and pain" in social comparison (Brickman & Bulman, 1977; Levine, 1983; Pomerantz *et al*., 1995). A comparative framework may be quite motivating for some high-achieving students, provided that they continue to outperform others. Learning that one has a higher ability or greater potential than others might help direct future efforts toward particularly fruitful domains. People benefit from knowing their strengths and boys, in particular, may benefit from knowing them in normative terms. On the other hand, highlighting normative comparisons through praise may leave children vulnerable when they no longer perform at the top of the class. Social-comparison praise delivered by a teacher may set the bar higher for what children expect or need to hear about their performance on subsequent tasks. Indeed, after receiving social-comparison praise in Study 1, children's motivation suffered even in the *absence of* subsequent feedback. How much more might children's motivation have suffered if future feedback suggested that their performance was mediocre or even inferior? Because not all children can be above average on every occasion for every task, normative comparisons in the classroom may come at a cost, perhaps especially for low-achieving children.

Should social-comparison praise in the classroom be avoided altogether? The present studies suggest that mastery praise may be a more adaptive alternative that enhances intrinsic motivation without incurring the same potential costs. Both social-comparison and mastery praise have an informational component that transmits a positive sense of competence to recipients, but mastery praise accomplishes this without an additional normative component. Instead, mastery praise communicates the excellence of children's achievements by framing praise in terms of developed expertise, career potential, special talents, or personal improvement. In the present research, mastery praise enhanced intrinsic motivation more than social-comparison praise in both ambiguous (Study 1) and successful (Study 2) contexts except for boys in Study 2, though we might question how they would react to subsequent uncertainty about their performance–a situation they are bound to encounter at some point in the future. Given the range of ability levels in a typical classroom, therefore, these findings suggest that teachers might best promote intrinsic motivation among their students by using mastery praise.

Limitations and directions for future research

One must be cautious when comparing across studies as we have done in the present analysis. In Study 1, we gave children no feedback about their performance on the drawing task whereas in Study 2 we gave them positive feedback and provided them with a sample of other children's work that was largely inferior to theirs. Children in Study 2, therefore, were not given the same opportunity as children in Study 1 to explore the information stations. Because the measures of intrinsic motivation in Study 1 were collected *after* children's time at the stations, it is possible that the effects were driven by their experiences with the stations rather than the praise statements per se. Indeed, children in the social-comparison praise condition spent less time at the creative ability station than their counterparts in the other two conditions. Perhaps the process of scoring their work was particularly motivating–a process that children in the social-comparison praise condition experienced to a lesser degree. We think this is an unlikely explanation, however, because only 14 children completed the scoring worksheet and removing them from the dataset did not attenuate the findings.[3] Nonetheless, it is possible that the effects of praise on intrinsic motivation observed in Study 1 were indirect and dependent upon particular patterns of exploration at the information stations.

There are also limitations of the particular age group selected for the present study. We chose to work with fourth- and fifth-grade students because children by this age are capable of using social-comparison information to make inferences about ability (Ruble *et al*., 1980, 1976; Ruble & Frey, 1991) and, more generally, have achieved a differentiated concept of ability (Nicholls, 1978). Precisely because of the differences between upper elementary children and preschool or early elementary children, however, younger children should be included in future research. A tentative hypothesis is that any negative effects of social-comparison

[3] With the 14 children removed from the dataset ($n_{SC} = 3$, $n_M = 6$, $n_C = 5$), the main effect of condition on self-reported intrinsic motivation was significant, $F(2, 69) = 3.90$, $p < .05$, $\eta_p^2 = .10$. Children in the social-comparison condition ($M = 3.42$, $SD = .51$) reported less intrinsic motivation than those in the mastery praise ($M = 3.85$, $SD = .58$) or control ($M = 3.60$, $SD = .60$) conditions. Similarly, the main effect of condition on the behavioral measure of intrinsic motivation was significant, χ^2 $(2, N = 72) = 7.70$, $p < .05$. More children in the mastery praise condition (62%) selected the whole sheet of lines than those in the control (26%) or social-comparison praise (30%) conditions.

praise would not be found with younger children. Examining the effects of social-comparison versus mastery praise with an adult population would also be informative because only one previous study has made such a direct comparison (Koestner *et al*., 1990) and that study did not provide a subsequent experience of ambiguity about performance.

Finally, the inherent limitations of laboratory research apply to the present study. Praise in the real world is most often given in the context of an ongoing relationship–parent-child, teacher-student, employer-employee–and it is unclear how social-comparison and mastery praise would affect motivation differently in these contexts. Naturalistic observations and field studies in the classroom or workplace are likely to be fruitful directions for future research.

Conclusion

Mastery praise benefits intrinsic motivation and social-comparison praise curtails it when uncertainty about children's subsequent achievements is introduced and, for girls, even in situations of continued success. Social-comparison praise arguably teaches children that personal competence should be measured by their relative standing in a group rather than their development of particular skills–a harmful message when children encounter situations that lead them to doubt their ability. Motivation and perseverance may be maximized, therefore, by avoiding social-comparison praise in favor of praise that emphasizes skill development.

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