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Praise for Intelligence Can Undermine Children's Motivation and Performance

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Praise for ability is commonly considered to have beneficial effects on motivation. Contrary to this popular belief, six studies demonstrated that praise for intelligence had more negative consequences for students' achievement motivation than praise for effort. Fifth graders praised for intelligence were found to care more about performance goals relative to learning goals than children praised for effort. After failure, they also displayed less task persistence, less task enjoyment, more low-ability attributions, and worse task performance than children praised for effort. Finally, children praised for intelligence described it as a fixed trait more than children praised for hard work, who believed it to be subject to improvement. These findings have important implications for how achievement is best encouraged, as well as for more theoretical issues, such as the potential cost of performance goals and the socialization of contingent self-worth.

Praise for high ability is a common response to a job well done. Whether it is on the sports field or in the classroom, nothing seems more natural than to commemorate individuals' achievements by applauding their abilities in some way. It is thus unsurprising that this type of praise has been widely accepted as a popular tool in the development and maintenance of individuals' academic achievement motivation, behaviors, and strategies (Brophy, 1981; Koestner, Zuckerman, & Koestner, 1987; Schunk, 1983, 1994; cf. Delin & Baumeister, 1994; Kanouse, Gumpert, & Canavan-Gumpert, 1981).

Praise for intelligence, in particular, has been targeted as playing an important role in children's perceptions of their ability and motivation to succeed. In one striking example, 85% of the parents polled in a recent study believed that praising children's ability (i.e., their intelligence) when they perform well on a task is necessary to make them feel that they are smart (Mueller & Dweck, 1996). Indeed, some child-care experts claim that increasing children's beliefs that they "have the capacity" in this way will "turn on [their] 'go-power' " and help motivate them to learn (Briggs, 1970).

In essence, one can identify a lay theory of achievement motivation in which praise for intelligence makes children feel smart and feeling smart, in turn, motivates learning. Thus, while conventional wisdom for parenting may tell adults to criticize the behavior but not the child, lest children learn to label themselves negatively (Briggs, 1970), the conventional wisdom for praise is quite the opposite: The more we label children as smart, the greater will be their enjoyment of and motivation for achievement.

However, attributing children's good performance to intelligence may have an undesired impact on children's overall achievement. Some interesting research has documented that ability praise after success can have a variety of negative effects when it leads children to believe the praise to be insincere (Meyer, 1992; Meyer, Mittag, & Engler, 1986) and when it leads them to feel pressured to produce future good performance (Baumeister, Hutton, & Cairns, 1990; cf. Baumeister, 1984). Although both of these effects may describe ways in which ability-related praise influences children, the primary focus of this article is on the direct effects that this praise has on children's goals and on their interpretations of subsequent achievement.

Consequences of Praise for Ability Given After Good Performance

Praise for ability may negatively affect children's responses to achievement situations in two different ways. Having their good performance linked to high intelligence may influence children by changing their goals for achievement and by altering the attributions that they make for their performance.

First, praise for ability or intelligence may lead children to adopt a performance goal orientation toward their achievement in which the documentation of high ability levels through successful performance becomes their primary motivational aim. That is, telling children that they are smart when they perform well may cause them to want to continue to prove that they are intelligent by receiving high scores. Indeed, an emphasis on grades and some types of verbal praise has been found to lead children toward the assessment of their abilities through performance (Butler, 1987, 1988).

This focus on performance can have negative consequences for children's affect, cognitions, and behavior (Butler, 1987; Dweck & Leggett, 1988; Elliott & Dweck, 1988; cf. Nicholls,

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1984). For example, Dweck and her associates have demonstrated that children who hold performance goals are likely to sacrifice potentially valuable learning opportunities if these opportunities hold the risk of making errors and do not ensure immediate good performance (Elliott & Dweck, 1988). That is, "being challenged" and "learning a lot" are rejected in favor of "seeming smart" by children who subscribe to a performance orientation (Mueller & Dweck, 1997). Furthermore, an emphasis on performance goals has been linked to vulnerability to a maladaptive helpless response to achievement setbacks (Dweck & Leggett, 1988; Elliott & Dweck, 1988), which is characterized by negative affect, negative self-cognitions, and performance impairment in the face of failure (Diener & Dweck, 1978, 1980).

Second, praise for intelligence after good performance may also directly contribute to children's responses through the development of stable ability attributions for failure. Specifically, evaluators who praise for ability may teach children that intelligence is a stable trait that is reflected in and can be easily read from performance. If children carry away this lesson, they may read low intelligence from poor performance and thus make ability attributions not only for their successes but also for their failures.

Whereas individuals who attribute their successes to internal abilities or traits have been classified as being high in achievement efficacy (cf. Schunk, 1994, 1996) and motivation (cf. Weiner, 1972, 1985; Weiner et al., 1971), individuals who attribute their failures to ability have not been credited with the same positive strivings. On the contrary, the negative motivational consequences of attributions that ascribe failures to ability have been well documented by researchers interested in achievement (Bell, McCallum, Bryles, & Driesler, 1994; Covington & Omelich, 1984; Dweck, 1975; Jagacinski & Nicholls, 1984; Weiner, Russell, & Lerman, 1979). In particular, Dweck and her associates have linked ability attributions for failure to helpless responding in the face of failure (Diener & Dweck, 1978, 1980; Dweck & Leggett, 1988; Elliott & Dweck, 1988). In this study, we propose that praise for their intelligence, *even when it follows a genuine success,* teaches children that they can measure how smart they are from how well they do. Therefore, if they subsequently do poorly, children may remeasure their ability from this low performance.

Consequences of Praise for Effort Given After Good Performance

If intelligence praise has unwanted consequences for children's achievement after failure, what type of praise might result in resiliency to setbacks? In this research, we compared the goals and achievement behaviors of children praised for intelligence with those of children praised for effort (i.e., hard work). Praise for hard work was chosen as a comparison for praise for intelligence primarily because effort is one of the fundamental causal ascriptions for achievement outcomes (Weiner, 1972, 1985) and its attributional message was one that was predicted to enhance achievement motivation. Praise for effort is proposed to affect children in terms of both their goals and their attributions.

First, effort-related praise may lead children to focus on the process of their work and the possibilities for learning and improvement that hard work may offer. Because of this emphasis on their efforts, children may feel able to focus on the development of their skills through the mastery of new material. In other words, they may orient toward learning goals, which have been associated with high achievement motivation (cf. Nicholls, 1984) as well as continued displays of persistence, enjoyment, and good performance in the face of setbacks (Dweck & Leggett, 1988; Elliott & Dweck, 1988).

Second, children praised for their hard work may learn to attribute their performance to effort, which can vary in amount, rather than to a stable ability. Thus, they will interpret subsequent poor performance as indicating a temporary lapse in effort rather than as a deficit in intelligence. Attributions that emphasize effort have been correlated with achievement motivation (Powers, Douglas, Cool, & Gose, 1985) and positive postfailure striving (Diener & Dweck, 1980; Dweck, 1975; Nicholls, 1976). Thus, praise for hard work may lead children to display more adaptive achievement behaviors after failure than children praised for intelligence.

Previous Comparisons of Effort Feedback and Ability Feedback

Findings from previous work that compared the effects of effort praise and ability praise do not, at first glance, appear to follow the proposals outlined above (Miller, Brickman, & Bolen, 1975; cf. Schunk, 1996). For instance, Schunk found that praise for ability sometimes had a more beneficial effect on children's achievement motivation, in particular their self-efficacy, than praise for effort. In addition, Miller et al. found that children told that they were "very good" and had "excellent ability" in mathematics improved their performance more than children told that they had worked hard.

However, these comparisons of effort praise and intelligence praise focused mainly on the feedback's effects under conditions of success. Whether the praise may lead to differences in children's responses to a specific failure has remained largely unexamined. In addition, previous researchers did not clearly examine the effects that praise for effort versus praise for intelligence may have on children's achievement goals and performance attributions.

The Current Research

The six studies described in this article were designed to distinguish between the effects of praise for ability (i.e., intelligence) and praise for effort (i.e., hard work) on a variety of measures under conditions of failure as well as success.

Specifically, we expected children praised for intelligence to make more ability attributions for their failures than children praised for hard work, whom we expected to prefer effort attributions (Studies 1, 3, 5, and 6). We also expected children praised for intelligence to show that they had begun to see their performance as a reflection of their ability by choosing to work on tasks that would ensure good performance (Studies 1 to 4), exhibiting performance-oriented behaviors such as misrepresenting their actual scores to others (Study 3), and seeking information about the scores of others over strategy information (Studies 3 and 4).

In addition, we expected children praised for intelligence to show more negative responses, such as less persistence, less enjoyment, and worse performance, after setbacks than children praised for effort (Studies 1, 3, 5, and 6). Support for these hypotheses was provided by the recent finding that kindergarten-age children who received person- or trait-related feedback did display more negative responses after setbacks (e.g., self-blame, negative affect, and low persistence) than children who received strategy-related feedback (Kamins & Dweck, 1997).

Further, we hypothesized that praise for intelligence may influence children's beliefs about and definitions of intelligence. We predicted that praise that portrayed intelligence as being measured from performance would lead children to define intelligence in terms of a fixed, internal entity, whereas we expected that praise that emphasized effort would lead children to focus on its malleable, motivational components (Studies 4 and 6). Indeed, the pattern of performance goals, ability attributions, and helpless postfailure responses described above has been associated with an entity view of intelligence as a fixed trait, whereas learning goals, effort attributions, and mastery responses have been linked to an incremental view of intelligence as subject to improvement (Dweck & Leggett, 1988; Mueller & Dweck, 1997).

Several of the studies also were designed to investigate possible alternate explanations for the effects of ability and effort praise. In Studies 2 and 4 we examined whether children's divergent responses might be linked to their different expectations for future performance, as opposed to differences in the meanings that they assign to performance. In Study 5 we investigated whether children's responses might be caused by differences in their expectations of evaluator judgments, as proposed in previous work (Baumeister, 1984; Baumeister et al., 1990). Finally, in Study 6 we examined whether children's divergent responses might be specific to their beliefs about the nature of the experimental task.

Study 1

As noted earlier, we hypothesized that praise directed at an ability (in these experiments, intelligence) and praise directed at effort or hard work, when administered after success, would lead children to hold different goals for their achievement and to have different responses when confronted with failure or challenge.

We expected praise for intelligence to foster a desire in children to pursue a performance goal, leading children toward documentation of their intelligence at the expense of learning. On the other hand, we expected praise for effort to lead children to prefer a learning goal that emphasizes the mastery of new and challenging material.

In addition, we hypothesized that praise for effort and praise for intelligence would lead children to have different responses when confronted with difficult situations. As described earlier, a performance goal has been linked to a helpless reaction characterized by negative self-cognitions, negative affect, challenge avoidance after failure, and impaired performance, whereas a learning goal has been associated with a mastery orientation characterized by positive self-cognitions, positive affect, challenge-seeking behaviors, and enhanced performance (Elliott & Dweck, 1988). Therefore, we hypothesized that children receiving intelligence praise would show less task enjoyment, less task persistence, and worse task performance after failure than children praised for effort.

Furthermore, the attributions that children made for their failures were expected to be strongly influenced by praise. In this study, we expected children praised for their intelligence after success to explain subsequent failures in terms of this ability. On the other hand, we expected children praised for hard work to attribute failure to a lack of effort.

This study also included a control group of children who received praise without any attributional component. On the basis of previous goal research (Elliott & Dweck, 1988), we expected these children to hold learning and performance goals in approximately equivalent numbers. Further, we expected their postfailure reactions to fall between those of the two experimental groups.

Method

Participants. A total of 128 fifth graders (70 girls and 58 boys) participated in this study. Forty-nine percent were from one public elementary school in a small midwestern town, and 51% were from two public elementary schools in a large northeastern city. Children ranged in age from 10 to 12 years; their mean age was 10.7 years (SD = 0.6). Fifty percent of the children were Caucasian, 19% were African American, and 31% were Hispanic. Informed consent for the participation of all children in this and subsequent studies was given by parents, teachers, and school principals.

Measures. All children were asked to work on three sets of problems, each containing 10 Standard Progressive Matrices (Raven, 1976). Scores were based on the number of problems solved in each set.

Children's achievement goals were measured after they had worked on the first set of (success) matrices and received feedback. The measure was designed to contain a choice of tasks that embodied different goals and has been used successfully in previous studies (see Dweck & Leggett, 1988).

Three of the choices represented variations of a performance goal in that they focused on the display of ability: "problems that aren't too hard, so I don't get many wrong," "problems that are pretty easy, so I'll do well," and "problems that I'm pretty good at, so I can show that I'm smart." The fourth choice, "problems that I'll learn a lot from, even if I won't look so smart," represented a learning goal in that it emphasized the development of ability over the display of high performance. Three performance goal selections were used to offset the potential social desirability of a learning goal (Leggett, 1986).

After they had made their selections, children were told that their choices would be granted if there was extra time at the end of the session, but first they were to work on the experimental tasks that had been decided before the study began. This explanation was given so that children selecting different options would not differ in their expectations of the nature and difficulty of their subsequent tasks. Experimenters remained blind to children's goal choices because children were asked to place their response sheets, as well as all subsequent response sheets, in an unmarked envelope without showing them to the experimenters.

After a second, difficult trial, children were asked to respond to a series of questions that probed their desire to persist on the problems, their enjoyment of the problems, their perceptions of the quality of their performance, and their attributions for poor performance. Children rated their task persistence, task enjoyment, and performance quality on a scale from 1 (*not at all*) to 6 (*very much*). Task persistence was indexed by children's responses to the question "How much would you like to take these problems home to work on?" Task enjoyment was indexed by children's responses to the questions "How much did you like working on the first/second set of problems?" and "How much fun were the problems?" Finally, children's judgments about the quality of their task performance were indexed by their responses to the question "How well did you do on the problems overall?"

After children responded to the measures described above, their attributions for their poor performance on the second set of problems were assessed through the use of a disk device described in previous research on children's achievement (Diener & Dweck, 1980; Leggett, 1986; Nicholls, 1975). Specifically, the disk consisted of four superimposed circles of colored paper that could be adjusted to reveal different amounts of each color. Each colored paper contained an attributional statement. The four statements were chosen to represent three possible explanations for poor performance on the progressive matrices: lack of effort ("I didn't work hard enough"), lack of ability ("I'm not good enough at the problems" and "I'm not smart enough"), and lack of time ("I didn't have enough time"). Two ability attributions were included to increase the perceived acceptability of this choice. Children were asked to explain why they "had some trouble" and "made some mistakes" on the problems. By exposing different amounts of each color, they were able to choose how much weight, if any, they desired to assign to each attributional statement. The circles were divided into 36 equal segments, and attributions were scored by noting the proportion of the 36 segments that was assigned to each attribution.

Finally, children were asked to assign weights to the importance of their smartness and their hard work for their performance by coloring in portions of a circle. This measure served as a manipulation check that allowed us to determine whether or not children had understood (and believed) the feedback given to them by the experimenters. Thus, this measure indicates the believability of the experimental feedback.

Procedure. Children were seen individually by one of four female experimenters. After being escorted from their usual classroom to an empty classroom, they were introduced to the task, given a brief tutorial in one strategy for problem solving, and asked to work on the first set of 10 progressive matrices, chosen to be of moderate difficulty. They were told that there would be a time limit on their work, and after 4 min, they were asked to stop working on the problems. At this point, the experimenter scored their solutions, and children were given one of three types of feedback that constituted the experimental manipulation. All children were told that they had performed well on this problem set: "Wow, you did very well on these problems. You got [number of problems] right. That's a really high score." No matter what their actual score, all children were told that they had solved at least 80% of the problems that they answered.

Some children (n = 41) were praised for their ability after the initial positive feedback: "You must be smart at these problems." Some children (n = 41) were praised for their effort after the initial positive feedback: "You must have worked hard at these problems." The remaining children (n = 46) were in the control condition and received no additional feedback.

After children were praised, they were asked whether they preferred to pursue performance or learning goals as described above. Next, they were given 4 min to work on a more difficult set of 10 progressive matrices. After 4 min or the completion of all 10 problems, they were informed that they had performed poorly ("a lot worse") on them. Children in all three groups were told that they had solved no more than 50% of the problems that they answered.

After receiving this negative feedback, children were asked to rate their desire to persist on the problems, their enjoyment of the problems, the quality of their performance, and the failure attributions, as described above. They subsequently were given 4 min to work on a third set of progressive matrices equal to the first set in level of difficulty. This process yielded a measure of postfailure performance.

During the debriefing given at the end of the experimental session, all children were informed that the second problem set contained problems of increased difficulty, which were considered to be appropriate for older, seventh-grade students. In fact, they were told that answering even one of these difficult problems was quite an achievement for students in their grade level. Thus, they were assured of the overall high quality of their task performance. Extensive precautions were taken to ensure that all children left the experimental setting proud of their performance.

Results and Discussion

In general, a series of two-way analyses of variance (ANOVAs) were conducted to examine the effects of different experimenters, schools, gender, and ethnicity on children's responses to the dependent measures. Only a few sporadic and inconsistent effects were found for these variables; none of them affected the interpretation of the study findings. These variables were therefore not examined further and will not be discussed in greater detail.

Five participants were excluded from analysis in Study 1 because they were able to solve only one or fewer of the first set of problems. Children's average actual score on the first set of problems was 5.2 (SD = 1.8) out of 10 total problems. The average number of problems attempted was 7.9 (SD = 2.0).

Preliminary analyses were conducted in order to examine the effect of children's task ability on their responses. Participants were divided into three groups according to their actual scores on the first set of problems, a rough index of their ability on the task. Two-way ANOVAs (praise by initial task performance) revealed no significant interactions between these factors on any of the dependent measures. This result indicates that children's ability on the progressive matrices did not influence or moderate the effects of praise for intelligence versus praise for effort on their responses. Thus, children who in fact had high ability on the task were affected by the intelligence praise in the same way as children who were less skilled.

Finally, preliminary analyses indicated that all children appeared to accept experimenters' explanations for their performance. A one-way ANOVA revealed that the weights that they assigned to smartness and hard work differed according to the type of feedback that they were given, $F(2, 116) = 15.90, p < .001$. Children praised for their intelligence (M = 8.89) considered their smartness to be significantly more important to their performance than did children praised for their effort (M = 5.68), $t(73) = 6.88, p < .001$. Again, two-way ANOVAs (praise by actual ability) revealed no significant interactions between these factors.

Goal choice. As shown in Figure 1a, goal choice was clearly affected by the content of the praise. A chi-square analysis revealed a significant difference in children's choice of achievement goals after praise, $\chi^2(2, N = 123) = 29.04, p < .001$. Most children who received intelligence feedback chose performance goals (67%), whereas few who received effort feedback preferred this type of goal (8%). Instead, those who received effort feedback chose learning goals (92%). Children in the control condition were divided equally between performance and learning goals. Thus, effort praise led children to

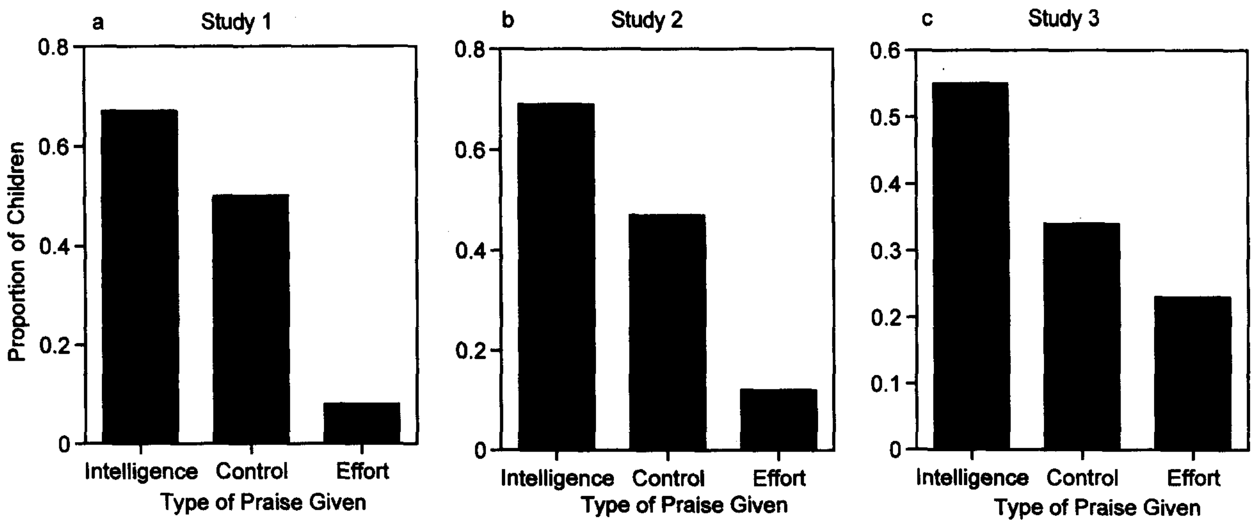

Figure 1. Proportion of children who selected performance (rather than learning) goals plotted as a function of the type of praise given.

want to learn new things, while intelligence praise led children to wish to continue looking smart.

Postfailure dependent measures. As shown in Table 1, significant differences were found in the attributions that children made for their low performance on the second set of problems. As described above, children's failure attributions were measured by asking them to apportion 36 segments of a wheel among four attributional statements. One of the statements attributed poor performance to low effort, two statements attributed it to low ability, and one statement attributed it to lack of time. The two ability statements were averaged to create the measure of children's low-ability attributions.

One-way ANOVAs indicated two differences in the attributions that the groups made for their poor performance. Specifically, children differed in their endorsements of low effort, $F(2, 120) = 8.64$, $p < .001$, and low ability, $F(2, 120) = 4.63$, $p < .05$, as causes of their failure. No significant group differences were expected or found for the attribution that focused on lack of time as an explanation for failure, and it will not be discussed further.

Follow-up t tests revealed that children praised for effort assigned greater weight to low effort ($M = 11.96$, $SD = 8.15$) than did children praised for ability ($M = 4.94$, $SD = 7.04$), $t(75) = -4.05$, $p < .001$. Children in the control ($M = 10.58$, $SD = 8.43$) and effort conditions did not differ in their low-effort attributions, $t(82) = 0.76$, *ns*. In addition, children praised for intelligence after success attributed relatively more of their failure to a lack of ability ($M = 16.49$, $SD = 11.04$) than did those praised for effort ($M = 9.78$, $SD = 9.00$), $t(75) = 2.92$, $p = .005$. Children in the control ($M = 13.88$, $SD = 9.18$) and ability conditions did not differ, $t(83) = 1.19$, *ns*.

These differences in children's use of ability and effort attributions to account for their poor performance provided support for the contention that praise can have differential effects on the meanings that children assign to their performance. Children praised for intelligence appeared to learn that their performance reflected their ability and thus attributed low performance to low ability. Children praised for hard work, on the other hand, did not show such a marked tendency to measure their intelligence from how well they did on the problems.

In addition, the different forms of praise were found to lead children to display divergent responses after failure on a number of other measures. Four one-way ANOVAs were performed on the dependent measures of task persistence, task enjoyment, task performance, and performance judgments. As shown in Table 2, significant differences were found between the groups for children's ratings of the first two of these dependent measures.

First, a one-way ANOVA disclosed a significant difference in postfailure task persistence, $F(2, 120) = 11.14$, $p < .001$. Children praised for intelligence were less likely to want to persist on the problems ($M = 3.25$, $SD = 1.41$) than children praised for effort ($M = 4.53$, $SD = 1.03$) and children in the control condition ($M = 4.30$, $SD = 1.33$). Follow-up t tests indicated that children praised for intelligence differed in their desire to persist from those praised for effort, $t(75) = -4.50$, $p < .001$, as well as those in the control condition, $t(83) = -3.52$, $p < .005$. No significant differences were noted for the persistence of children in the effort and control conditions, $t(82) = 0.84$, *ns*.

Another one-way ANOVA revealed a significant difference in children's postfailure task enjoyment, $F(2, 120) = 7.73$, $p < .005$. Children praised for intelligence ($M = 4.11$, $SD = 1.02$) enjoyed the tasks less than did children praised for effort ($M = 4.89$, $SD = 0.72$); again, children in the control condition ($M = 4.52$, $SD = .81$) fell in between the other two groups. Follow-up t tests showed that children praised for intelligence were significantly less likely to enjoy the problems than were children in the effort, $t(81) = -3.81$, $p < .001$, and control, $t(83) = -2.03$, $p < .05$, conditions. Further, children in the control condition were less likely to enjoy the problems than were those praised for effort, $t(82) = 2.16$, $p < .05$.

A third one-way ANOVA revealed significant differences be-

Table 1
Failure Attributions Made After Poor Performance as a Function of Type of Praise Given

Dependent measure	Type of praise		
	Study 1		
	Intelligence (n = 41)	Effort (n = 41)	Control (n = 46)
Low ability*			
M	16.49_{a}	9.78_{b}	13.88_{a}
SD	11.04	9.00	9.18
Low effort****			
M	4.94_{a}	11.96_{b}	10.58_{b}
SD	7.04	8.15	8.43
	Study 3		
	Intelligence (n = 29)	Effort (n = 30)	Control (n = 29)
Low ability****			
M	19.79_{a}	7.70_{b}	12.28_{c}
SD	7.18	6.20	7.43
Low effort****			
M	4.07_{a}	14.83_{b}	7.97_{c}
SD	3.43	7.70	4.87
	Study 5		
	Intelligence (n = 16)	Effort (n = 15)	Control (n = 15)
Low ability****			
M	20.94_{a}	7.75_{b}	12.06_{b}
SD	7.17	9.50	8.06
Low effort****			
M	7.13_{a}	20.06_{b}	10.06_{a}
SD	5.52	11.32	6.79
	Study 6		
	Intelligence (n = 16)	Effort (n = 16)	Control (n = 16)
Low ability**			
M	16.94_{a}	7.13_{b}	13.31_{a}
SD	9.74	6.48	8.67
Low effort****			
M	7.25_{a}	20.81_{b}	5.75_{a}
SD	5.34	9.42	4.92

Note. Within rows, means with different subscripts differ significantly. Asterisks refer to the overall analysis of variance.
* $p < .05$. ** $p < .01$. **** $p < .001$.

tween the groups in their change in performance from the first to the third problem set, $F(2, 120) = 17.62$, $p < .001$, even though a separate analysis showed no differences in their performance on the first set of problems, $F(2, 120) = 1.82$, *ns*. As shown in Figure 2a, scores for children receiving intelligence feedback dropped an average of 0.92 ($SD = 1.53$) after failure. Children in the effort condition, however, improved their prefailure scores by 1.21 ($SD = 1.63$) problems. Children in the control condition improved their scores only very slightly ($M = 0.13$, $SD = 1.57$). These results are particularly striking because they demonstrate that the scores of children praised for intelligence decreased after failure even though their increased familiarity with the tasks should have bolstered, not weakened, their skills.

Follow-up t tests indicated that children praised for intelligence differed significantly from those in the effort, $t(75) = -5.93$, $p < .001$, and control, $t(83) = -3.12$, $p < .005$, conditions. In addition, children praised for effort differed significantly from those in the control condition, $t(82) = 3.08$, $p < .005$.

Children did not differ in their performance on the second, failure trial, $F(2, 120) = 0.18$, *ns*. Their average actual score was 1.6 ($SD = 1.3$) out of 10 problems, with an average of 5.8 ($SD = 2.6$) problems attempted.

Interestingly, a fourth one-way ANOVA revealed no significant differences in how the three groups rated their task performance after two problem sets, $F(2, 120) = 0.79$, *ns*. This

Table 2
Ratings of Task Persistence and Enjoyment Made After Poor Performance as a Function of Type of Praise Given

Dependent measure	Type of praise		
	Study 1		
	Intelligence (n = 41)	Effort (n = 41)	Control (n = 46)
Task persistence****			
M	3.25_{a}	4.53_{b}	4.30_{b}
SD	1.41	1.03	1.33
Task enjoyment***			
M	4.11_{a}	4.89_{b}	4.52_{c}
SD	1.02	0.72	0.81
	Study 3		
	Intelligence (n = 29)	Effort (n = 30)	Control (n = 29)
Task persistence****			
M	3.24_{a}	5.20_{b}	4.28_{c}
SD	0.83	1.00	1.29
Task enjoyment****			
M	3.86_{a}	4.99_{b}	4.49_{c}
SD	1.01	0.55	0.94
	Study 5		
	Intelligence (n = 16)	Effort (n = 15)	Control (n = 15)
Task persistence*			
M	3.44_{a}	4.62_{b}	4.56_{b}
SD	1.59	1.63	1.26
Task enjoyment***			
M	3.92_{a}	5.19_{b}	4.90_{b}
SD	0.95	0.82	0.95
	Study 6		
	Intelligence (n = 16)	Effort (n = 16)	Control (n = 16)
Task persistence			
M	3.75	4.63	4.00
SD	1.18	1.20	1.03
Task enjoyment***			
M	3.84_{a}	4.86_{b}	4.41_{b}
SD	0.74	0.88	0.80

Note. Within rows, means with different subscripts differ significantly. Asterisks refer to the overall analysis of variance.
* $p < .05$. *** $p < .005$. **** $p < .001$.

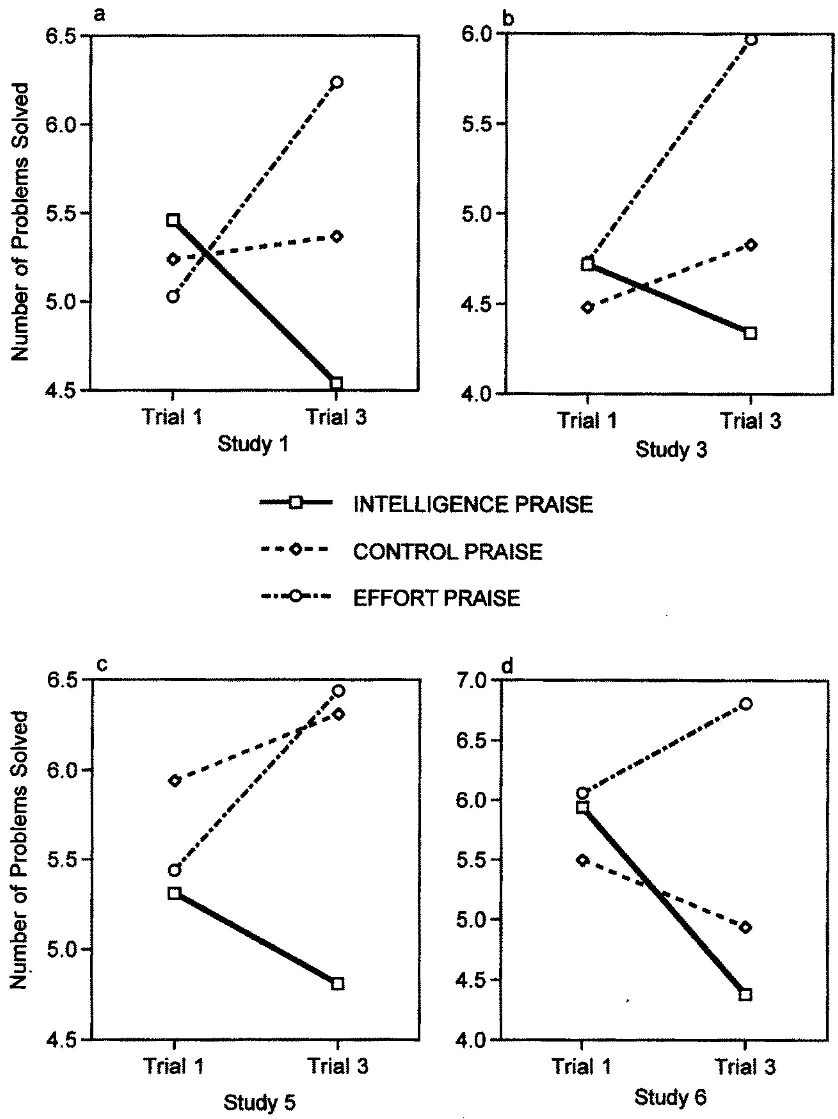

Figure 2. Number of problems children solved before failure (Trial 1) and after failure (Trial 3). For data from Study 6, different tasks were used on Trials 1 and 3.

finding indicates that the effects of praise for intelligence were not attributable to this group's harsh judgment of their performance. Instead, it lends further support to our contention that the same failure experience took on different meanings for the different groups.

Overall, the findings of Study 1 support our hypothesis that children who are praised for intelligence when they succeed are the ones least likely to attribute their performance to low effort, a factor over which they have some amount of control. Instead, they show the most marked preference for ability over effort explanations among the three groups. Thus, praise for intelligence does not appear to teach children that they are smart; rather, such praise appears to teach them to make inferences about their ability versus their effort from how well they perform.

Particularly interesting is the fact that no significant differences were noted between two very different samples of participants. That is, both children from a midwestern school, whose ethnic makeup was almost entirely Caucasian American, and children from two northeastern schools, whose ethnic makeup was predominantly African American and Hispanic, were affected by praise for effort and praise for ability in the same way. The similar responses of these two divergent populations provide an internal replication for the findings of Study 1.

Study 2

The results of Study 1 supported our initial predictions that praise for effort versus praise for intelligence after success leads children to hold different achievement goals and to display different postfailure responses. However, Study 1 did not fully investigate the different consequences of these types of praise for children's motivation before their poor performance. Whereas children's achievement goals were measured before they encountered setbacks, their task enjoyment, task persistence, and performance judgments were not examined until after they had experienced a failure.

Thus, the following question remains: Does the vulnerability to failure caused by an emphasis on ability become evident before children face setbacks? One aim of Study 2 was to investigate whether praise for intelligence, in the absence of failure, has more negative motivational consequences for enjoyment or persistence than does praise for effort.

In Study 1, we also proposed that praise for intelligence and praise for effort can result in distinct postfailure responses because they send children different messages about the meaning of their performance. That is, praise for intelligence leads children to believe that performance is a direct measure of this ability in a way that praise for hard work does not. Study 2 was designed to investigate two possible alternate explanations for the findings of Study 1.

Given the findings of some previous research (Schunk, 1983), children praised for their intelligence might show higher expectations for their future performance (as well as greater enjoyment and persistence) than might children praised for effort. If they did, then their low scores on the second problem set might lead them to be more disappointed and thus to display less task enjoyment, less persistence, and worse performance than children praised for effort.

Alternatively, the negative responses to challenge shown by children praised for ability might result from their judgments of their initial, successful, performance. Children praised for intelligence might judge their performance more highly than might children praised for hard work, which might lead to greater disappointment and the more negative responses to setback described above. This explanation is not supported by the results of Study 1, because no differences were found between the groups' performance judgments after the second problem set. However, it cannot be entirely discounted by the findings of Study 1.

Method

Participants. A total of 51 fifth graders (26 girls and 25 boys) from a public elementary school in a large northeastern city participated in this study. Children ranged in age from 9 to 11 years; their mean age was 10.5 years ($SD = 0.5$). Two percent of the children were Caucasian, 76% were African American, and 22% were Hispanic.

Measures and procedure. Children were randomly assigned to one of three categories of praise—intelligence, effort, and control—so that 17 children made up each group. All children worked on the first set of Standard Progressive Matrices (Raven, 1976) used in Study 1. Achievement goals were again measured after children had received positive feedback.

Children were also asked to respond to questions from Study 1 that probed their desire to persist on the problems, their enjoyment of the problems, and their perception of their performance. However, these measures were taken after their success on the first problem set. In addition, expectations of future performance on the problems were measured by responses to the question "How well do you expect to do on another set of problems like these?"

Results and Discussion

As shown in Figure 1b, this study replicated the finding that children praised for effort and those praised for intelligence differed in the achievement goals that they chose to pursue, $\chi^2(2, N = 51) = 11.3, p < .01$. A total of 69% of children praised for intelligence preferred performance to learning goals, compared to only 12% of children praised for effort. That is, children praised for hard work preferred learning goals (88%). Children in the control condition endorsed performance (47%) and learning (53%) goals in approximately equal measures. These results are remarkably similar to those obtained in Study 1 and underscore the powerful effects that effort praise and ability praise have on the goals that children have for their achievement.

One-way ANOVAs were conducted on children's task persistence and task enjoyment. No significant differences were found between the intelligence, effort, and control conditions for measures of children's task persistence, $F(2, 48) = 1.06$, *ns* ($M = 5.00$, $M = 4.76$, and $M = 5.29$, respectively), and task enjoyment, $F(2, 48) = 0.17$, *ns* ($M = 4.97$, $M = 5.00$, and $M = 4.82$, respectively).

These findings are interesting in part because they do not correspond to the findings of other researchers, who have suggested that ability praise may lead to benefits that effort praise does not (cf. Schunk, 1996). However, because the studies varied in both the praise statements and the dependent measures used, it is not altogether surprising that Study 2 failed to reveal these effects.

The findings of Study 2 do, however, support the contention of earlier work (Elliott & Dweck, 1988) that goals do not lead to different achievement behaviors in the absence of challenge. Praise for intelligence does not appear to lead to obvious motivational deficits immediately after a successful and well-received task performance. Therefore, the differences in postfailure task enjoyment, performance, and task persistence observed for children in Study 1 cannot be attributed to prefailure differences between the groups in enjoyment and persistence.

Furthermore, the contrasting reactions of the groups to setbacks were not caused by differences in their prefailure expectations for performance. One-way ANOVAs were conducted on children's expectations of future success as well as on their judgments of their current performance. No significant differences were noted for children's expectations, $F(2, 48) = 1.01$, *ns;* children in the intelligence, effort, and control conditions displayed equivalent expectations ($M = 5.50$, $M = 5.06$, and $M = 5.12$, respectively). In addition, no significant differences were found between the performance judgments for children in the intelligence ($M = 5.25$), effort ($M = 4.94$), and control ($M = 4.53$) conditions, $F(2, 48) = 2.04$, *ns.*

The differential effects of praise for intelligence and praise for hard work on children's reactions to challenge thus are not caused by disappointment brought on by children's different expectations for their future performance.

The findings of Study 2, taken together with those of Study 1, continue to provide support for the notion that children's postfailure responses are not attributable to differences in their judgments of their performance. In Study 1, children were asked to rate their overall performance after completing two sets of progressive matrices and receiving both positive feedback and negative feedback. As noted earlier, no significant differences were found between the groups on this measure. In Study 2, children were again asked to rate their performance, but this time only on the first set of problems, on which they received praise. No significant differences were found between the effort and ability conditions. These results indicate that effort praise and intelligence praise do not lead children to judge their performance differently. That is, children praised for intelligence do not appear to rate their poor performance more harshly or their good performance more highly than do children praised for effort. This conclusion is consistent with the fact that all children received the same degree of praise for their performance and differed only in the attributions that they received for their success.

The findings of Study 2, then, support the view that the experimental groups' contrasting responses to failure were likely caused by whether children learn to read their effort or their ability from their performance as a consequence of praise for hard work or intelligence.

Study 3

We designed Study 3 to satisfy two main goals. The first aim was to replicate the finding of Study 1 that praise for intelligence and praise for hard work had different consequences for children's achievement goals and postfailure responses. The second aim was to extend the investigation of intelligence praise and effort praise by examining children's goals and concerns in several new ways.

What do children care most about after failure: finding out how to master problems better or finding out how well their peers performed? If children are more oriented toward a learning goal, then they should display a greater interest in acquiring additional strategies so that they can better understand the problems (Butler, 1993; cf. Ruble & Frey, 1991). If, on the other hand, they are more oriented toward a performance goal, they should be more interested in knowing the scores of others in order to assess or validate their ability (Butler, 1993; cf. Ruble & Frey, 1991). Thus, children praised for effort, who prefer learning goals, were expected to seek information about learning. Children praised for intelligence, who prefer performance goals, were expected to seek information related to the performance of others. This result would also suggest that these children were truly performance oriented and not simply trying to retain the experimenter's high opinions of their intelligence by choosing goals that ensured continued good performance.

Next, how do children praised for intelligence versus those praised for effort represent their task performance to others? To answer this question, children were asked to report their scores confidentially to an anonymous child at another school. To the extent that they had learned that performance reflected their intelligence, we hypothesized that children praised for their ability would be more likely to misrepresent their performance in a favorable direction. In contrast, to the extent that children praised for effort did not see their performance as reflecting negatively on fundamental aspects of the self, they should have less reason to distort their performance. Both of these results would suggest that intelligence praise does not simply teach children that the adult experimenter is measuring them from their performance. Rather, they would support the idea that children learn to measure their own ability from their performance. Otherwise, why would they bother to find out the scores of unfamiliar others and misrepresent their scores to an unidentified child?

Method

Participants. A total of 88 fifth graders (48 girls and 40 boys) participated in this study. Seventy-four percent were from one public elementary school in a small midwestern town, and 26% were from two public elementary schools in a large northeastern city. Children ranged in age from 9 to 11 years; their mean age was 10.3 years ($SD = 0.5$). Seventy-four percent of the children were Caucasian, 8% were African American, and 18% were Hispanic. Informed consent for the participation of all children was given by parents, teachers, and school principals.

Measures and procedure. In addition to the measures used in Study 1, two additional measures were added at the end of the original procedure to test the hypothesis that children praised for ability respond differently to difficulty than do children praised for effort. A total of 29 children received intelligence praise, 30 received effort praise, and 29 made up the control group.

First, in order to determine whether children praised for ability were more likely to misrepresent their actual performance after setbacks than were children praised for effort, their self-reports were assessed. Participants were asked to write a description of the third set of problems for children in another state. They were asked to state in their descriptions how many of the third set of problems they had answered correctly. The accuracy of their score reports was determined by subtracting the number of problems they claimed to have solved from the actual number they answered correctly.

In addition, postfailure information seeking was measured to test the hypothesis that children praised for ability would be more interested in measuring their performance than in mastering the problems and that children praised for effort would show the opposite preference. Children were presented with two identical folders; one contained "interesting new strategies" for solving the problems (strategy information), and the other contained the "average scores" of unfamiliar children (performance information). Children were asked to choose only one of the two folders to read.

Results and Discussion

Goal choice. As shown in Figure 1c, children's goal choice was clearly affected by the content of the praise that they were given. A chi-square analysis revealed a significant difference in children's choice of achievement goals after praise, $\chi^2(2, N = 88) = 6.55$, $p < .05$. Whereas 55% of children who received intelligence feedback chose performance goals, only 23% of children who received effort feedback preferred these goals; 34% of children in the control condition elected to pursue performance, rather than learning, goals. Thus, again, intelligence praise led children to wish to continue looking smart, whereas effort praise led children to want to learn new things.

Postfailure Dependent Measures

Replication of Study 1. As shown in Table 1, one-way ANOVAs revealed that the groups differed in their endorsements of low effort, $F(2, 85) = 27.54$, $p < .001$, and low ability, $F(2, 85) = 22.68$, $p < .001$, as causes of their failure.

Children praised for hard work assigned greater weight to low effort (M = 14.83, SD = 7.70) than did children praised for intelligence (M = 4.07, SD = 3.43) and children in the control condition (M = 7.97, SD = 4.87). Follow-up t tests showed that children praised for hard work preferred effort attributions significantly more than did children praised for ability, $t(57) = -6.90$, $p < .001$, and children in the control condition, $t(56) = 4.08$, $p < .001$. Further, children in the ability and control conditions also differed significantly from each other on this measure, $t(56) = -3.52$, $p = .001$.

In addition, children praised for intelligence after success attributed relatively more of their failure to a lack of ability (M = 19.79, SD = 7.18) than did children praised for hard work (M = 7.70, SD = 6.20) and children in the control condition (M = 12.28, SD = 7.43). Two-tailed t tests indicated that children in the intelligence condition preferred low-ability attributions significantly more than did children in the effort, $t(57) = 6.93$, $p < .001$, and control, $t(56) = 3.92$, $p < .001$, conditions. Children praised for hard work also differed significantly from those in the control condition, $t(57) = -2.57$, $p < .05$. Again, intelligence praise for success seems to lead students to measure the level of their ability rather than how hard they worked from their performance.

Four one-way ANOVAs were performed on the dependent measures of task persistence, task enjoyment, task performance, and performance judgments. As shown in Table 2, significant differences were found between the groups for children's ratings of two of the dependent measures. The findings were consistent with the results of Study 1.

A one-way ANOVA revealed a significant difference in children's postfailure task persistence, $F(2, 85) = 25.62$, $p < .001$. Follow-up t tests indicated that the persistence of children praised for intelligence (M = 3.24, SD = 0.83) was significantly lower than that of children praised for effort (M = 5.20, SD = 1.00), $t(57) = -8.19$, $p < .001$, and children in the control condition (M = 4.28, SD = 1.29), $t(56) = -3.65$, $p = .001$. Further, children in the effort condition showed a greater desire to persist than did those in the control condition, $t(57) = 3.10$, $p < .005$.

A second one-way ANOVA revealed a significant difference in the postfailure task enjoyment of the groups, $F(2, 85) = 12.95$, $p < .001$. Children praised for intelligence (M = 3.86, SD = 1.01) enjoyed the tasks less than did children praised for effort (M = 4.99, SD = 0.55); again, children in the control condition (M = 4.49, SD = 0.94) fell in between the other two groups. As indicated by t tests, children praised for intelligence enjoyed the problems significantly less than did children praised for effort, $t(57) = -5.36$, $p < .001$, and children in the control condition, $t(56) = -2.48$, $p < .05$. A significant difference was also found between children in the effort and control conditions, $t(57) = 2.48$, $p < .05$.

A third one-way ANOVA revealed significant differences between the groups' performance from the first to the third problem set, $F(2, 85) = 6.58$, $p < .005$, even though the children's performance did not differ on the first set of problems, $F(2, 85) = 0.28$, *ns*. As shown in Figure 2b, intelligence-feedback children's scores on the problems given after failure dropped an average of 0.37 (SD = 1.42) from their scores on the first set of problems. Children in the effort condition, however, improved their prefailure scores by 1.23 (SD = 1.50) problems. Children in the control group improved scores somewhat (M = 0.34, SD = 2.13). As indicated by t tests, children praised for intelligence differed significantly from those in the effort condition, $t(57) = -4.23$, $p = .001$, but not those in the control condition, $t(56) = -1.52$, *ns*. In addition, there was a trend for children praised for hard work to improve their postfailure performance more than children in the control condition, $t(57) = 1.86$, $p < .10$.

A fourth one-way ANOVA was conducted to examine children's perceptions of their task performance. As in preceding studies, no differences were noted on this measure, $F(2, 85) = 2.70$, *ns*.

Extension of Study 1. As shown in Figure 3, an additional chi-square analysis revealed significant differences in children's information-seeking behaviors after setbacks, $\chi^2(2, N = 88) = 24.24$, $p < .001$. Eighty-six percent of children praised for ability chose to read information related to the performance of others over information related to problem-solving strategies. Only 23% of children praised for effort made the same choice, and the rest, the majority, opted for strategy information that might help them learn more about alternate task solutions. Sixty-two percent of children in the control condition preferred performance information over strategy information.

Thus, children in the ability condition were more likely to seek information that might bolster them but would not further their learning or aid their performance should they ever be asked to perform tasks similar to those presented here again. This finding provides further support for the notion that, when allowed to pursue their interests, children praised for intelligence adopt a performance orientation; their preference for informa-

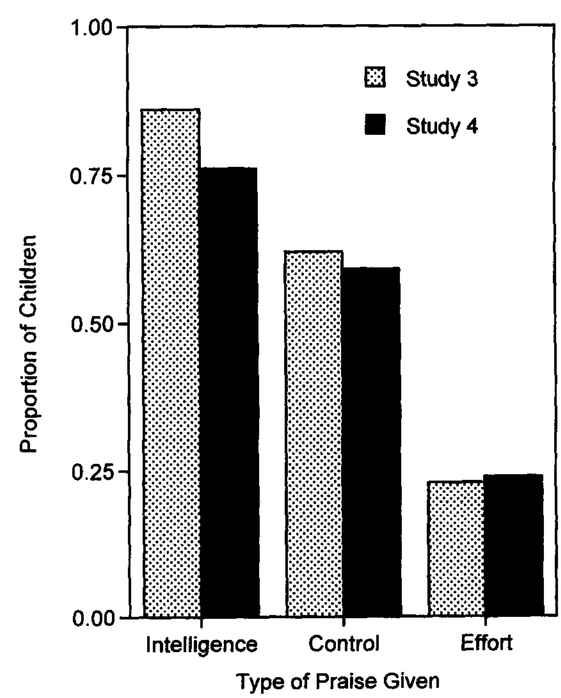

Figure 3. Proportion of children who selected performance (rather than strategy) information plotted as a function of the type of praise given.

tion about scores rather than strategies indicates that they focus on performance in their own right and not just in order to document their abilities to an evaluator.

Further, the accuracy of children's self-reports of their performance on the third set of problems was measured. The difference between the number of problems that children reported that they solved to other fifth graders and the number of problems that they actually answered correctly was examined. As shown in Figure 4, a chi-square analysis revealed significant group differences on this measure, $\chi^2(2, N = 88) = 6.61, p < .05$. A full 38% of the children praised for ability misrepresented their scores to unfamiliar children, whereas only 13% of the children praised for effort and 14% of the children in the control condition did so. On average, the children praised for intelligence added 0.45 point ($SD = 1.22$) to their actual score. All children's misrepresentations increased their actual scores, suggesting that these inaccuracies were not attributable to random errors in children's memory of their scores.

This finding suggests that over one third of children praised for intelligence cared so much about their performance and how it reflected on them that they lied about their performance to another child rather than admitting to a lower score. The unwillingness of these children to report their true scores in this way seems particularly striking when one considers that on this measure, children were reporting their scores to completely unfamiliar children, whom they were certain never to meet.

The tendency of children praised for intelligence to misrepresent their scores offers support for the contention that they indeed learned to measure themselves from their performance in their own right. Because great care was taken to ensure that children believed that adults would never see their score reports, any overstatements of their performance were unlikely to have been for the benefit of the experimenter. Instead, it seems plausible to suggest that children praised for intelligence were led to exaggerate their own scores by some internal judgments that they had made—that is, the judgment that their performance was an index of their intelligence. Children praised for hard work, in contrast, did not necessarily share this type of self-judgment and so would have felt less pressure to artificially increase the reports of their scores.

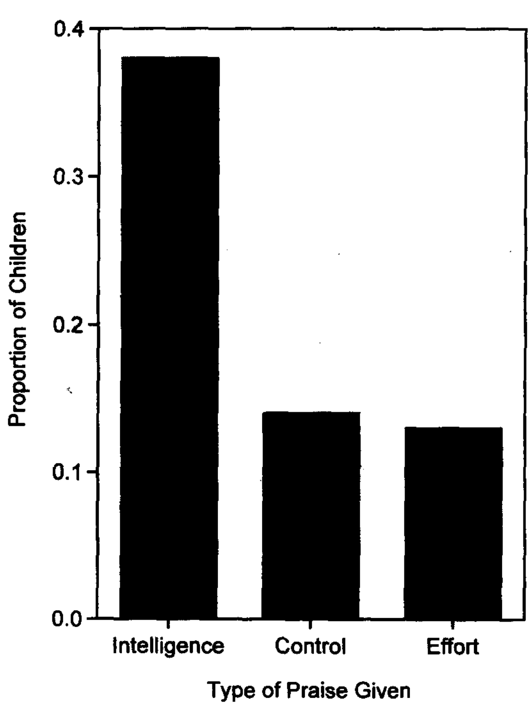

Figure 4. Proportion of children who misrepresented their scores on the experimental task plotted as a function of the type of praise given.

Overall then, the results of this study demonstrated that praising children for intelligence after good performance can backfire by making children highly performance-oriented and extremely vulnerable to the effects of subsequent setbacks. Children's performance orientation was indicated by their tendency to sacrifice learning goals and strategy information in favor of performance goals and normative information as well as by their tendency to misrepresent their actual scores after failure. Their vulnerability to setbacks was demonstrated by their relatively low enjoyment, persistence, and performance as well as their low-ability attributions after failure. Praising children for effort, meanwhile, appears to allow them to focus on the opportunities for mastery provided by learning goals and strategy information and to avoid the vulnerabilities (i.e., low enjoyment, persistence, and performance) that can be associated with task difficulties. Indeed, praise for intelligence appears to teach children to measure their ability from their performance on a task in a way that praise for hard work does not.

Study 4

Study 4 was intended to replicate and extend the findings of Study 2. We hypothesized that, after a successful performance, children praised for intelligence would not differ from those praised for effort or those in the control condition in their task enjoyment, persistence, expectations, and performance judgments. Also, we hypothesized that children praised for intelligence would endorse a performance goal in greater numbers than would children praised for effort, as had been found in the three preceding reported studies.

In Study 4 we also further investigated the contrasting information-seeking behaviors exhibited by children praised for intelligence and those praised for effort in Study 3. We hypothesized that children praised for intelligence would again prefer information about the performance of others that would allow them to measure themselves. In this study, however, we measured children's information preferences after their initial successful performance, when they may well have expected to work on additional problems. In this case, then, a preference for performance-related information would effectively rob children of useful problem-solving strategies that might improve their performance on later trials. We expected that children praised for effort would again prefer information about new strategies that would help them master the tasks.

We also designed Study 4 to extend the findings of the first three studies by investigating the influence that praise might have on children's beliefs about the nature of intelligence. How might praise for intelligence orient children toward an entity view of intelligence? By judging intelligence exclusively from a small sample of work (e.g., "You got a high score; you must be smart"), an adult might imply that children's intelligence is an internal, perhaps stable, trait that readily displays itself in performance. That is, the feedback may convey that intelligence is a stable dimension that can be reliably measured.

Praise for hard work, on the other hand, does not appear to carry this message of intelligence as a fixed trait to children. Instead, because this type of praise emphasizes effort as playing a fundamental role in achievement, it is likely to orient children toward the development of their abilities. This focus is consistent with an incremental view that characterizes intelligence as something that can be developed.

Method

Participants. A total of 51 fifth graders (29 girls and 22 boys) from a public elementary school in a large northeastern city participated in this study. Children ranged in age from 9 to 11 years; their mean age was 9.9 years ($SD = 0.5$). Two percent of the children were Caucasian, 69% were African American, and 29% were Hispanic. Seventeen children were assigned to each feedback group.

Measures and procedure. The first part of this study was designed to replicate Study 2. Then, children's implicit theories of intelligence were measured in order to investigate how praise might influence children's beliefs about the fixedness of intelligence. Specifically, children were asked to rate a statement taken from the Implicit Theory Scale ("You have a certain amount of intelligence and really can't do much to change it") on a scale from one (not at all true) to six (very true) (see Dweck, Chiu, & Hong, 1995, for a review).

Next, participants' information-seeking preferences were measured as in Study 3. Children were asked to choose to read either a folder containing strategy-related information or one containing performance-related information. However, in this study the assessment was made after the first (success) trial and not after a failure task.

Results and Discussion

Replication of Study 2. Unlike the findings of the three preceding studies, children who received intelligence, effort, and control praise were not found to differ in the achievement goals that they chose to pursue, $\chi^2(2, N = 51) = 5.51$, *ns.*

However, the four one-way ANOVAs replicated the findings of Study 2. No significant differences were found between the groups in interest in task persistence, $F(2, 47) = 1.03$, *ns,* task enjoyment, $F(2, 47) = 0.68$, *ns,* judgments of current performance, $F(2, 47) = 0.07$, *ns,* and expectations of future success, $F(2, 47) = 1.41$, *ns.*

Extension of Study 2. As shown in Figure 3, the finding from Study 3 that children praised for different aspects of their performance displayed different information-seeking behaviors was also noted in this study, $\chi^2(2, N = 51) = 9.92$, $p < .01$. Seventy-six percent of children praised for intelligence chose to read information related to the performance of others over information related to problem-solving strategies. Only 24% of children praised for hard work made the same choice. Fifty-nine percent of children in the control condition also preferred performance information over strategy information. In this study, children's information-seeking preferences were assessed after success. The preoccupation children praised for ability had with measurement was thus even more striking than that in Study 3, because their neglect of strategy-related information was likely to have an adverse effect on their future problem solving. Ironically, then, the children who are typically most concerned with their performance were most likely to handicap themselves by sacrificing an opportunity to gain potentially beneficial strategy information.

In addition, as shown in Figure 5, an ANOVA revealed significant differences in the degree to which the groups endorsed an entity theory, $F(2, 47) = 4.98$, $p < .05$. Children praised for intelligence were more likely to rate intelligence as being fixed ($M = 4.24$, $SD = 1.79$) than were children praised for effort ($M = 2.19$, $SD = 1.52$); children in the control condition fell in between children in the other two conditions ($M = 3.47$, $SD = 2.24$). Follow-up t tests showed that children praised for intelligence were significantly more likely to endorse an entity theory than were children praised for effort, $t(31) = 3.54$, $p = .001$. However, children praised for effort, $t(31) = -1.92$, *ns,* and those praised for intelligence were not found to differ significantly from those in the control condition, $t(32) = 1.10$, *ns.*

These findings provide preliminary evidence for the contention that praise for intelligence after high performance can lead children to believe that what is being measured is fixed intelligence more than praise for hard work does.

Study 5

The first four studies provided substantial support for the strong effect that different types of praise can have on children's achievement motivation. However, they do not eliminate several alternate explanations that may account for some of the findings. We designed Study 5 to investigate two of these alternate

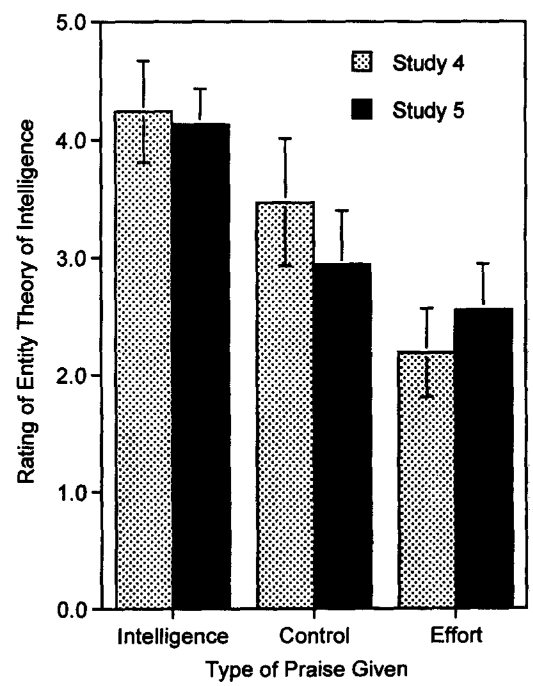

Figure 5. Rating of agreement with an entity theory (intelligence is fixed) plotted as a function of the type of praise given. Error bars reflect the standard error of the mean.

hypotheses. First, children's contrasting postfailure responses might have been attributable to the fact that a single experimenter administered both positive feedback and negative feedback. Children praised for intelligence and children praised for effort might have had distinct interpretations of the experimenter's comments. Children told that they "must be smart" might have believed that the experimenter would continue to measure their intelligence from subsequent poor performance. In this case, the behaviors displayed by children praised for ability might have been caused by their expectations of the experimenter's evaluations of their intelligence and not their own internal judgments. On the other hand, children told that they "must have worked hard" might have assumed that the experimenter measured only their effort from performance and thus would not have expected her to make ability assessments from subsequent failure.

Studies have demonstrated that when children believe that an evaluator perceives their ability to be high, they tend to feel that this evaluator expects them to continue to perform well (Baumeister, 1984; Baumeister et al., 1990; Meyer et al., 1979). Although this may be true in many cases, in this research we proposed that children reacted to their own assessments of the meaning of their performance rather than to the expectations of an evaluator. Study 5 tested this hypothesis by having two different experimenters administer the positive feedback and negative feedback to children. The first experimenter introduced children to the first experimental task and praised them for their good performance in one of the three ways described for the preceding studies. Then the children became acquainted with a second experimenter, who was blind to their experimental condition, who scored their second task, and who gave them the negative feedback after failure.

Because the children knew that the second experimenter had no knowledge of their initial good performance and positive feedback, they could not believe that she would have high expectations for their future performance. The children's different reactions to failure thus could not be attributed to their different interpretations of an experimenter's judgments of and disappointment in their poor performance. Instead, children's responses would more likely be brought on by their own tendency to use the message conveyed by different types of praise to judge themselves from their performance.

A second alternate hypothesis was also tested in Study 5. It is possible that, although the type of praise that children received did indeed influence their achievement goals, it was the public endorsement of these goals after a success that led children to exhibit contrasting responses after subsequent failure. That is, children who had openly expressed a desire for good performance might be more dejected after subsequent poor performance than children who had expressed a desire for learning. In order to eliminate this influence from the experimental setting, children were not asked to report any goal preferences in Study 5.

Method

Participants. A total of 46 fifth graders (26 girls and 20 boys) participated in this study. Twenty-six percent were from one public elementary school in a small midwestern town, and 74% were from two public elementary schools in a large northeastern city. Children ranged in age from 10 to 11 years; their mean age was 10.3 years ($SD = 0.5$). Twenty-four percent of the children were Caucasian American, 44% were African American, 30% were Hispanic, and 2% were Asian American. Children were randomly assigned to one of three categories of praise—ability, effort, and control—with 16 children receiving ability praise, 15 receiving effort praise, and 15 receiving control praise.

Measures and procedure. In essence, Study 5 replicated the procedure of Study 1 with two different experimenters. Immediately after they were introduced to the first experimenter and escorted to the experimental classroom, participants were given 4 min to work on the first set of 10 Standard Progressive Matrices (Raven, 1976). They then received feedback and praise from the experimenter.

Next, children were introduced to a second experimenter and asked to work on the second set of problems. It was made clear to the children that the second experimenter had no knowledge of their performance on the first set of problems. In addition, the second experimenter was blind to the type of praise that the children had been given by the first experimenter. The first experimenter remained out of sight for the rest of the session so that the children did not feel that she would be able to listen to and judge their later performance.

Children were informed that they had performed poorly on the second set of problems by the second experimenter. After this feedback, the procedure followed the original outline: Children were asked to rate their desire to persist on the problems, their enjoyment of the problems, the quality of their performance, and their failure attributions, as described for Study 1. They subsequently were given 4 min to work on a third set of progressive matrices that was equal to the first set in level of difficulty.

Results and Discussion

First, as shown in Table 1, significant differences again were found in the attributions that children made for their poor performance on the second set of problems; groups differed in their endorsements of low effort, $F(2, 45) = 10.79$, $p < .001$, and low ability, $F(2, 45) = 10.50$, $p < .001$, as causes of their failure. Children praised for effort assigned greater weight to low effort ($M = 20.06$, $SD = 11.32$) than did children praised for ability ($M = 7.13$, $SD = 5.52$) and children in the control condition ($M = 10.06$, $SD = 6.79$), who fell in between the other two groups. Follow-up t tests revealed significant differences between children in the effort and intelligence conditions, $t(30) = -4.11$, $p = .001$, as well as between those in the effort and control conditions, $t(30) = 3.03$, $p < .01$, but no differences were found between those in the intelligence and control conditions, $t(30) = -1.34$, *ns*.

In addition, children who were praised for intelligence after success attributed relatively more of their failure to a lack of ability ($M = 20.94$, $SD = 7.17$) than did children praised for hard work ($M = 7.75$, $SD = 9.50$) and children in the control condition ($M = 12.06$, $SD = 8.06$), who fell in between the other two groups. Follow-up t tests yielded significant differences between the ability attributions of children praised for ability and children in the effort, $t(30) = 4.43$, $p < .001$, and control, $t(30) = 3.29$, $p < .005$, conditions. Children in the effort and control conditions did not differ from each other significantly in their endorsement of low-ability attributions, $t(30) = -1.38$, *ns*.

As shown in Table 2, additional significant differences once again were found between the groups for ratings of several other dependent measures.

A one-way ANOVA revealed a significant difference in children's postfailure task persistence, $F(2, 45) = 3.16$, $p = .05$. Children praised for intelligence were less likely to want to persist on the problems after setbacks ($M = 3.44$, $SD = 1.59$) than were children praised for effort ($M = 4.62$, $SD = 1.63$); children in the control condition ($M = 4.56$, $SD = 1.26$) closely resembled those in the effort condition. Follow-up t tests revealed significant differences between the intelligence condition and the effort, $t(30) = -2.09$, $p < .05$, and control, $t(30) = -2.22$, $p < .05$, conditions but no difference between the effort and control conditions, $t(30) = 0.12$, *ns*.

A second one-way ANOVA disclosed a significant difference in children's task enjoyment after setbacks, $F(2, 45) = 8.64$, $p < .005$. Children praised for intelligence ($M = 3.92$, $SD = 0.95$) enjoyed the tasks less than did children praised for effort ($M = 5.19$, $SD = .82$); again, children in the control condition ($M = 4.90$, $SD = .95$) fell in between the other two groups. Follow-up t tests yielded significant differences between the intelligence condition and the effort, $t(30) = -4.07$, $p < .001$, and control, $t(30) = -2.92$, $p < .01$, conditions but not between the effort and control conditions, $t(30) = 0.82$, *ns*.

A third one-way ANOVA did not initially reveal significant differences in children's performance change between the first and third problem sets, perhaps because of the smaller sample size of Study 5 than of Study 1 and Study 3, $F(2, 45) = 2.13$, *ns*. However, a planned comparison revealed significant differences in the performance of children praised for intelligence and those praised for effort from the first to the third problem set, $t(30) = -2.10$, $p < .05$, even though children's performance did not differ on the first set of problems, $t(30) = -0.21$, *ns*. Intelligence-feedback children's scores on the problems given after failure dropped an average of 0.50 ($SD = 2.16$) from their scores on the first set of problems (Figure 2c). Children in the effort condition, however, improved their prefailure scores by 1.00 ($SD = 1.86$) problems. Children in the control group improved their scores slightly ($M = 0.38$, $SD = 2.16$). Two additional t tests did not yield significant differences between the performance of children in the effort and control conditions, $t(30) = 0.88$, *ns*, or between that of children in the intelligence and control conditions, $t(30) = -1.15$, *ns*.

As found in several of the preceding studies, a fourth one-way ANOVA revealed no significant differences in how the three groups perceived their performance after two problem sets, $F(2, 45) = 0.59$, *ns*.

Overall, the results of this study support the hypothesis that the contrasting responses to failure demonstrated by children praised for effort and those praised for ability were not caused by children's reactions to the judgments of a single experimenter. Children praised for intelligence after success displayed more negative responses to subsequent failure than did children praised for effort, even when the experimenter who administered the failure feedback was blind to the children's experimental condition and previous performance.

Furthermore, because children were not asked to explicitly state their achievement goals before they worked on the second problem set and encountered failure, their statements of these preferences could not in any way have influenced their later expectations or reactions. It seems increasingly likely that children's different responses to failure after praise for effort and after praise for ability are indeed attributable to differences in their interpretations of the meaning of their achievement, as originally hypothesized.

Study 6

We designed Study 6 primarily to examine yet another alternate interpretation of the findings of Studies 1 through 5. Earlier, we proposed that the two types of praise led children to interpret their performance in markedly different ways. We hypothesized that praise for intelligence would teach children to use their performance on an intellectual task as a measure of intellectual ability. In contrast, we proposed that praise for effort would lead children to emphasize the degree to which they worked on a task when explaining their performance.

However, an alternate explanation for the differences found in the preceding studies is that children learned that the particular experimental task on which they worked measured ability and not that performance on intellectual tasks, in general, measures ability. For instance, it is possible that children praised for ability after working on the first set of problems believed that the experimental task was actually designed to serve as an intelligence test. This belief could account for the heightened desire to do well, manifested in their endorsement of performance goals after praise. Furthermore, for these children, subsequent poor performance on the same task would have seemed to be a real measure of low intelligence. This interpretation could have resulted in the decreased subsequent motivation and performance that they displayed in the preceding studies. Children praised for hard work, meanwhile, were not likely to view the experimental task as being diagnostic of their intelligence, perhaps allowing them to avoid experiencing decrements in motivation and achievement.

We designed this study to assess the viability of this explanation by determining whether children praised for ability did indeed acquire a general tendency to judge their intelligence from their performance or whether they did so only for the task on which their intelligence was praised—the "diagnostic task." After children worked on the initial task and were praised for their intelligence, they were introduced to a novel task of unknown diagnosticity on which they encountered challenge. We then assessed children's responses to their poor performance on this new task. Because we initially hypothesized that children praised for ability learn to make general judgments about their skills from their performance, we expected these children to display reactions similar on the novel task to those documented in the preceding studies after failure. Similarly, we expected children praised for effort to display the resiliency to setback that they demonstrated in the preceding studies.

An additional aim of Study 6 was to examine whether the effect of contrasting forms of praise on children's beliefs about the nature of intelligence noted in Study 4 would be noted not only right after the praise, but also later on, after setbacks. In Study 4, children's theories about the malleability of intelligence were measured only after a successful performance. It could reasonably be argued that children who received a positive judgment of their intelligence from an adult experimenter might have had a greater interest in defining intelligence as fixed (thereby claiming a permanent positive judgment of this characteristic) than might children praised for effort. If this were true, greater endorsement of the entity view would not be expected in the face of poor performance, because children would no longer have any vested interest in believing that a low measurement of ability reflects a fixed trait.

In this study, we used two methods to measure children's theories of intelligence after they experienced a setback. First, as in Study 4, children rated their agreement with a statement about the nonmalleability of intelligence. In addition, they were asked to define intelligence in an open-ended question. Because we hypothesized that praise does indeed convey information on the nature of intelligence (and does not simply motivate children to adopt a belief that serves their interests), we expected to replicate the finding of Study 4 that children praised for intelligence agreed with a statement that described intelligence as fixed to a greater extent than did children praised for effort. We also wished to determine whether children praised for intelligence after success would also define the nature of intelligence more in terms of an ability or trait than would children praised for effort.

Method

Participants. A total of 48 fifth graders (23 girls and 25 boys) participated in this study. Eighty-one percent were from a public elementary school in a small midwestern town, and 19% were from a public elementary school in a large northeastern city. Children ranged in age from 10 to 12 years; their mean age was 10.8 years ($SD = 0.6$). Eighty-four percent of the children were Caucasian, 8% were African American, and 8% were Hispanic.

Measures and procedure. Much of the basic procedure outlined in Study 1 was used in this study. However, after the first set of Standard Progressive Matrices (Raven, 1976), children in this study were asked by the same experimenter to work on different kinds of problems for 4 min. These problems were taken from the revised Minnesota Paper Form Board Test (Likert & Quasha, 1970), which requires individuals to "perceive fragmented percepts as wholes" (Lezak, 1983) and which is quite distinct in appearance from Raven's Standard Progressive Matrices. The first set of these problems contained extremely difficult items, whereas the subsequent set contained items of moderate difficulty. Children's scores were again based on the number of problems that they solved.

Participants' desire to persist on the problems, their enjoyment of the problems, their attributions for failure, and their judgments about the quality of their performance after setbacks were assessed as in Study 1.

In addition, children's beliefs about the nature of intelligence were measured as in Study 4. These beliefs were also assessed when children were asked to define intelligence by completing the sentence "I think intelligence is . . ." Two coders who were blind to the experimental condition the children were in categorized children's responses to this open-ended question according to the presence (coded 1) or absence (coded 0) of two elements: their use of terms that emphasized the more malleable or motivational components of intelligence (e.g., effort and knowledge) and their use of terms that emphasized the trait-like nature of intelligence (e.g., ability and smartness).

Results and Discussion

Postfailure dependent measures. As found in the earlier studies and as shown in Table 1, one-way ANOVAs revealed that children differed in the attributions that they made for their failures. As expected, children differed significantly in their effort attributions, $F(2, 45) = 23.38, p < .001$. Children praised for effort ($M = 20.81$, $SD = 9.42$) attributed more of their low score to effort than did children praised for intelligence ($M = 7.25$, $SD = 5.34$); children in the control condition weighted effort essentially the same as did children in the intelligence condition ($M = 5.75$, $SD = 4.92$). Follow-up t tests revealed the expected significant difference between the effort and intelligence conditions, $t(30) = -5.01, p < .001$, as well as a significant difference between the effort and control conditions, $t(30) = 5.67, p < .001$. No significant difference existed between the intelligence and control conditions, $t(30) = 0.83$, *ns.*

Children also were found to differ in their ability attributions, $F(2, 45) = 5.57, p < .01$. Children praised for intelligence ($M = 16.94$, $SD = 9.74$) attributed more of their poor performance to ability than did children praised for effort ($M = 7.13$, $SD = 6.48$); children in the control condition fell in between the other two groups ($M = 13.31$, $SD = 8.67$). Follow-up t tests showed that children in the intelligence condition differed significantly from those in the effort condition, $t(30) = 3.36, p < .005$, but not from those in the control condition, $t(30) = 1.11$, *ns.* Children praised for effort differed significantly from those in the control condition, $t(30) = -2.29, p < .05$.

In addition, as shown in Table 2, children in the three groups differed in several other responses to failure. As in preceding studies, no differences were found in their performance judgments, $F(2, 45) = 0.35$, *ns.*

As in Studies 1, 3, and 5, a one-way ANOVA revealed a significant difference in children's postfailure task enjoyment, $F(2, 45) = 6.38, p < .005$. Children praised for intelligence ($M = 3.84$, $SD = 0.74$) described themselves as having enjoyed the problems less than did children praised for effort ($M = 4.86$, $SD = 0.88$); children in the control condition ($M = 4.41$, $SD = 0.80$) rated themselves similarly to children in the effort condition. Follow-up t tests indicated that children in the intelligence condition differed significantly from those in the effort, $t(30) = -3.54, p = .001$, and control, $t(30) = -2.07, p < .05$, conditions but that children in the effort condition did not differ from those in the control condition, $t(30) = 1.53$, *ns.*

Another one-way ANOVA revealed significant differences in children's performance on the problems after failure, $F(2, 45) = 6.18, p < .005$. For this study, postfailure performance was measured by examining the number of problems that children solved on the third problem set. As shown in Figure 2d, although they did not differ in the number of problems that they solved on the first, $F(2, 45) = 0.32$, *ns,* and second, $F(2, 45) = 0.54$, *ns,* problem sets, children praised for effort ($M = 6.81$, $SD = 2.23$) solved more problems after failure than did children praised for intelligence ($M = 4.38$, $SD = 2.16$) and children in the control condition ($M = 4.94$, $SD = 1.84$). Follow-up t tests showed that the scores of children in the effort condition differed significantly from those in the intelligence, $t(30) = -3.43, p < .005$, and control, $t(30) = 2.12, p < .05$, conditions but that the scores of children in the intelligence and control conditions did not differ from each other, $t(30) = -1.41$, *ns.*

However, unlike in the other studies, no significant differences were found in children's desire to persist after failure, $F(2, 45) = 2.49$, *ns.*

Overall, these findings indicate that, in spite of the introduction of a novel experimental task for the failure experience, children praised for intelligence continued to show greater decrements in enjoyment and performance than did children praised for effort. They also continued to attribute their failure to a lack of ability to a greater degree than did children praised for effort. Thus, children who were told that their high performance was caused by high intelligence appeared to continue to read their ability from subsequent performance, even on an unrelated task, whereas children praised for effort did not appear to reach the same conclusion. The differential effects of praise for hard work and praise for intelligence were therefore not limited to only one experimental task; the attributional messages conveyed by praise generalized to children's experiences with a new set of problems.

Definitions of intelligence. Figure 5 shows that a significant difference was obtained for children's endorsement of an entity versus an incremental theory of intelligence in this study, $F(2, 45) = 4.41, p < .05$. As in Study 4, children in the intelligence condition clearly endorsed an entity theory, affirming the fixed nature of intelligence ($M = 4.13, SD = 1.20$), whereas children in the effort and control conditions distinctly preferred an incremental view vis-à-vis the malleability of intelligence ($M = 2.56, SD = 1.55$, and $M = 2.94, SD = 1.84$, respectively). Follow-up t tests showed significant differences between the intelligence condition and both the effort, $t(30) = 3.19, p < .005$, and control, $t(30) = 2.16, p < .05$, conditions. No differences were noted between the effort and control conditions, $t(30) = -0.62$, *ns.*

These findings demonstrate that children praised for intelligence after a success are led to endorse statements that describe intelligence as a fixed trait that is not subject to development, even after they have experienced setbacks on a problem-solving task.

In a related vein, on the open-ended question, children in the effort and ability conditions were found to differ in their definitions of intelligence. The two raters showed 94% agreement on their coding of malleable or motivational terms (e.g., knowledge and effort) and 83% agreement on their coding of trait terms (e.g., smartness and ability); differences were resolved through discussion.

A chi-square comparison between children's use of malleable or motivational terms for intelligence (e.g., "studying hard," "trying your best," and "how much you know") revealed a significant difference between the intelligence and effort conditions, $\chi^2(2, N = 48) = 5.81, p = .05$. Whereas 56% of children praised for effort used these terms (e.g., "It is to work hard") to describe the nature of intelligence, only 25% of children praised for ability did so. The responses of children in the control condition resembled those of children in the intelligence condition; only 23% of them explained intelligence in terms of knowledge or effort.

However, although the differences were in the predicted direction, a chi-square analysis did not reveal significant differences between the three groups in terms of their use of trait terms (e.g., "It is smartness") to define intelligence, $\chi^2(2, N = 48) = 2.23$, *ns.*

Still, the results of the open-ended descriptions offer some corroboration for children's endorsement of the statement about the nature of intelligence. Children praised for ability after good performance were found to be somewhat more likely to later describe intelligence as a trait and to see it as not being subject to improvement than were children praised for effort, who preferred to define it in malleable or motivational terms and to view it as something that is subject to development or improvement. Children in the control condition were not oriented toward one consistent view of intelligence; although they tended to agree with an incremental theory of intelligence as malleable on the statement, they also used fewer malleable or motivational terms to describe intelligence in the open-ended question.

In summary, Study 6 demonstrated that the effects of praise for ability after successful performance on one experimental task generalized to children's responses when they encountered setbacks on a different task. In addition, it provided further evidence that praise after good performance influences children's beliefs about the nature of intelligence.

General Discussion

Taken together, the findings from the six studies provide striking evidence for the differential effects that praise for intelligence and praise for hard work have on children's achievement behaviors and beliefs.

These effects became apparent early in each experimental session when children were asked to choose between performance and learning goals for their future problem-solving tasks. Children praised for intelligence after success chose problems that allowed them to continue to exhibit good performance (representing a performance goal), whereas children praised for hard work chose problems that promised increased learning. This finding was further supported by the interest that children showed in different types of information after they worked on the experimental tasks. Children praised for intelligence preferred to find out about the performance of others on the tasks rather than to learn about new strategies for solving the problems, even when these strategies might have improved their future performance. Children praised for effort, on the other hand, demonstrated their continued interest in mastery by preferring to receive strategy-related information. Thus, praise for intelligence seemed to teach children to value performance, even when following their own information-seeking interests, whereas praise for hard work seemed to lead children to value learning opportunities.

Further, children who received ability feedback appeared to learn to measure their intelligence from their performance in a way that children who received effort feedback did not. After they faced failure, these children used low-ability, rather than low-effort, attributions to account for their poor performance more than did children praised for hard work, who preferred to ascribe their failures to low effort. Thus, the children who were explicitly told that they were smart after success were the ones who most indicted their ability on the basis of poor performance. This indictment of ability also led children praised for intelligence to display more negative responses in terms of lower levels of task persistence, task enjoyment, and performance than their counterparts, who received commendations for effort. That children praised for intelligence after success adopted the tendency to measure their ability from their performance also was evident in the ways in which they reported their performance to others. Children praised for intelligence showed a greater tendency to misrepresent their scores on the problems than did children praised for effort, in spite of the fact that their reports were anonymous and were not seen by the experimenter. This result suggested that children praised for intelligence learned to equate high performance with high ability in their own right and not for the benefit of an evaluator. Thus, these children, on their own, seemed to consider that low performance reflected their intelligence in a way in which children praised for hard work did not.

This belief in the power of performance to measure intelligence can become even more important to children's achievement responses when it is combined with an entity view of intelligence as a fixed trait. Indeed, praise for ability was found to orient children toward defining intelligence in terms of a stable trait. That is, praise for high ability after success appeared to lead children to believe intelligence to be a fixed trait whose level was measured from their performance on academic tasks. It is thus not surprising that children who received this type of intelligence feedback showed signs of distress after they experienced a setback in their achievement. Praise for hard work, on the other hand, appeared to lead children to hold a more incremental theory of intelligence as malleable and to define intelligence in terms of motivation and knowledge. These children did not appear to consider intelligence to be determined from any single performance and were found to avoid the postfailure achievement decrements of their intelligence praise counterparts.

Children in the control condition received praise that contained a positive assessment of their work (i.e., "That's a really high score") but no attributional component and that was similar to the performance-oriented praise used by Butler (1987) (e.g., "Good job"). In general, control group children showed more positive achievement motivation than did children praised for intelligence but somewhat more negative achievement motivation than did children praised for effort. This finding is particularly interesting because it indicates that, even when children are not taught to equate performance with intelligence, they sometimes respond more negatively after praise for an outcome or a product (i.e., "control" praise) than they do after praise for process or effort (i.e., praise for hard work).

It is also important to note that virtually all of the findings were replicated not only across genders but also across children from several different ethnic groups in both rural and urban communities. Thus, although other studies of achievement have noted cultural differences in children's interpretations of and responses to experimenter feedback (Garza & Lipton, 1978), the present phenomenon seems important to the achievement of all children and not just one specific cultural group.

Indeed, the differential effects of praise for effort and praise for ability were found to be independent of actual ability level. Children with high problem-solving scores were equally likely to display the praise effects as were children with low scores. Thus, even children who might reasonably be assumed to feel confident in their skills (or who might be most likely to believe the intelligence praise to be true) appear to be vulnerable to the negative motivational effects of a focus on ability over effort.

Alternative Explanations

Several possible explanations for the findings were eliminated by the results of Studies 2 through 6. First, it was possible that praise for intelligence might have led children to have higher judgments of their successful performance, higher expectations for their future performance, or lower judgments of their poor performance than might praise for effort. These different expectations or judgments then might have caused children praised for intelligence to appear more dejected or less motivated after failure than their effort praise counterparts. Studies 1, 2, and 4, however, showed that children receiving the different attributions for their success did not differ in their judgments of their past performance or their expectations for their future performance. Thus, their different postfailure persistence, enjoyment, performance, and other achievement behaviors could not be explained in this way.

Second, the low motivation and achievement displayed by children praised for intelligence after setbacks might have been caused by their interpretations of the experimenter's assessments of their ability after failure. That is, when these children were told by the experimenter that they must be smart, they might have believed that this experimenter would also measure their intelligence from subsequent poor performance and be disappointed in this evidence of low ability. In this case, the negative responses of these children to challenge might have been brought on by their inability to live up to their perceptions of the experimenter's judgments or expectations. This explanation was made less plausible by the results of Study 5, in which two experimenters administered praise for success and criticism for failure. Children knew that the second experimenter, who gave children the failure feedback, was not aware of their earlier success and the attributional content of the praise that they were given afterward and that the first experimenter had no knowledge of their subsequent poor performance. Thus, it is unlikely that children's negative postfailure behaviors and attributions were based on their interpretations of the ability-praising experimenter's disappointment in their abilities.

Finally, praise for intelligence might have led children to believe that the experimental task was actually an intelligence test that allowed the experimenter to diagnose their ability from their performance. This belief in the diagnostic nature of the task might have accounted for these children's negative reactions to their poor performance on the second set of problems. However, Study 6, in which a new task was used to provide the failure experience, ruled out this explanation. Because children encountered challenge on a task that was unrelated to the first one, it is unlikely that their subsequent negative responses could be ascribed to beliefs about this novel task's diagnosticity.

Thus, it seems likely that praise for intelligence did indeed lead children to learn that they could read trait information from their performance on intellectual tasks in a way that praise for effort did not. It is therefore not surprising that children exposed to this intelligence feedback, with an emphasis on proving ability through high performance, were likely to respond negatively when they faced achievement setbacks that prevented them from attaining their performance goals. Children given effort feedback, on the other hand, who valued learning over performance, were understandably less likely to fall apart when they experienced an isolated low performance.

Implications and Future Research

Although the encouragement of children with low achievement levels through the use of praise for their ability has received widespread parental support (Mueller & Dweck, 1996; Phillips, 1984), the findings of our studies indicate that it could lead to even more detrimental achievement beliefs and behaviors in these children. Instead, the results presented here suggest that when students succeed, attention and approbation should be directed at their efforts or work strategies. That is, children should be praised for the process of their work (e.g., focusing on the task, using effective strategies, or persisting on challenging problems) rather than for the end product and the ability that produced it.

In addition, the findings may be used to shed light on a persistent and puzzling paradox in achievement. Bright young girls who are academic stars in grade school often seem most vulnerable to later academic challenges (Cramer & Oshima, 1992; cf. Dweck, 1986; Dweck & Bush, 1976; Dweck, Davidson, Nelson, & Enna, 1978; Licht & Dweck, 1983, 1984). It is possible that in their desire to bolster young girls' confidence in their abilities, educators have gone out of their way to administer intelligence praise. As shown in our studies, this well-intentioned approach could have an undesired impact on later motivation and performance.

The findings presented here may also have implications for labeling children as talented or gifted, a form of intelligence praise. That is, when children are so labeled, some may become overly concerned with justifying that label and less concerned with meeting challenges that enhance their skills. They may also begin to react more poorly to setbacks because they worry that mistakes, confusions, or failures mean that they do not deserve to be labeled as gifted. It may therefore be especially important in gifted-student programs to maintain an emphasis on meeting challenges, applying effort, and searching for strategies.

Still, several limitations to our studies must be considered. For instance, our studies all were conducted with novel experimental tasks administered individually. Children may respond somewhat differently to praise for other types of tasks and in other settings. Such potential experimental limitations must be thoroughly explored to determine the boundary conditions of our findings. It is also important to examine the feedback context in which the praise is given. Specifically, it might be that the postfailure effects of praise for intelligence can be mitigated by the attributional content of the failure feedback. For instance, it is possible that the negative postfailure achievement effects of intelligence praise may be avoided if effort attributions are used as part of the failure feedback. Feedback that contains an effort message may serve to reduce the harsh effects that failure can have on the achievement of children praised for intelligence. It could send an alternative message about the meaning of performance in the diagnosis of ability that may weaken the ability orientation demonstrated in these studies. Further, it could give children the option to attribute their poor performance to a temporary state as opposed to a permanent trait. Thus, the effects of the combination of effort attributions and ability praise on children's responses to failure may be a fruitful area of future research.

Future investigations of the impact of praise on children's postfailure responses could lead to a closer examination of effort praise itself and its effects on motivation. Is praise for effort, strategy, or process always beneficial to children, or can it lead them to greater disappointment if it is overemphasized or if hard work fails to yield satisfactory results? Further, what impact might praise that describes effort in stable, trait terms (e.g., "You must be a hard worker") have on children's achievement? Given the negative consequences of praise for ability, the use of trait terms to describe effort might well impair the positive effects that effort praise has been demonstrated to have on postfailure responses.

The present research speaks to recent work suggesting that performance goals can promote intrinsic motivation and good performance (Harackiewicz, Baron, Carter, Lehto, & Elliot, 1997). We would not dispute this possibility. Indeed, the intelligence praise group, which was predominantly performance goal oriented, showed high intrinsic motivation after their initial success, in terms of both task enjoyment and a desire to take the problems home to work on them further. However, on the basis of our present findings we would suggest that performance goals carry greater vulnerability than do learning goals: In the face of failure, both the intrinsic motivation and the performance of the intelligence praise group showed sharp decrements. In most intrinsic motivation research, the hardiness of the intrinsic motivation—such as its ability to withstand failure—is not tested. We suggest that this might be a highly fruitful avenue for future research.

Our findings might also speak to the important issue of contingent self-worth, the belief that one's worth or basic competence is dependent on performing well (Burhans & Dweck, 1995; Dykman, 1998; Harter, 1990). The intelligence praise can be seen as promoting a sense of contingent self-worth vis-à-vis intelligence and a need for validation. Those receiving the intelligence praise opted for a task that would provide further validation of their intelligence and, more than the other groups, saw failure as an invalidation of their intelligence. It would be highly interesting to investigate further the role of trait-oriented feedback in establishing a sense of contingent self-worth (see also Kamins & Dweck, 1997).

Overall, our studies illustrate the important, and often unsuspected, role that praise after success can play in children's later achievement motivation. Well-meant praise for intelligence, which is intended to boost children's enjoyment, persistence, and performance during achievement, does not prepare them for coping with setbacks. In fact, we have demonstrated that this type of ability feedback can undermine children's motivation when they are later confronted with challenge. Indeed, researchers, educators, and parents alike might be well advised to borrow a guideline from the literature on criticism when they decide to praise children. That is, as with criticism, it is better to separate "the deed from the doer" by applying praise to children's strategies and work habits rather than to any particular trait. Because children cannot be insulated from failure throughout their lives, great care should be taken to send them motivationally beneficial messages after success.

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