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Is Effort Praise Motivational? The Role of Beliefs in the Effort-Ability Relationship

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Is Effort Praise Motivational? The Role of Beliefs in the
Effort-Ability Relationship

Abstract

In two studies, we investigated how beliefs in the effort-ability relationship moderated the effects of effort praise on student motivation. Study 1 showed that the more the participants believed that effort and ability were related positively (the positive rule) versus related negatively (the inverse rule), the more they would have positive self-evaluation and intrinsic motivation after effort praise. Study 2, with participants' beliefs manipulated by a priming procedure, showed that the participants in the positive rule condition had better self-evaluation and more intrinsic motivation after effort praise than their counterparts did in the inverse rule condition. The results of the two studies converged to indicate that the motivational effects of effort praise depend on beliefs in the effort-ability relationship.

Praise is commonly used to motivate children in learning (Brophy, 1981; Emmer, 1987; Hitz & Driscoll, 1988). Among various types of praise, effort praise has been found to best foster adaptive achievement responses. Children receiving effort praise were found to show higher levels of interest and challenge seeking than children receiving other forms of praise. For example, in a series of studies, Mueller and Dweck (1998) found that praise for effort (i.e., “You must have worked hard at these problems.”) had more positive consequences for children’s task enjoyment, persistence, and performance than praise for intelligence (i.e., “You must be smart at these problems.”). Similarly, Kamins and Dweck (1999) found that, in the face of setbacks, children displayed less helpless responses on self-assessment, affects, and persistence after effort praise than ability praise. The positive effects of effort praise are most likely due to the mechanism of effort attribution (Weiner, 1985). Effort praise encourages children to attribute their learning outcomes to effort, an internal and controllable factor. This conveys a message to children that they can remedy a failure situation and are in control of their learning outcomes.

Despite the evidence for the positive effects of effort praise, there are also studies showing otherwise. Miller, Brickman, and Bolen (1975) found that children who were praised for working hard did not improve their performances as much as children who were told that they had “excellent ability.” Similarly, Schunk (1982, 1983) also found that children who were praised for their efforts showed less skill acquisition and self-efficacy than children praised for their abilities. These results were replicated in samples of college students (Koestner, Zuckerman, & Koestner, 1987) and Chinese children (Hau & Salili, 1996). Schunk (1983) explains the superiority of ability praise over effort praise on the basis of self-efficacy theory (Bandura, 1977). He reasons that ability praise should produce higher expectations for future performance than effort praise because of the stronger competence information.

In view of these inconsistent findings, the positive effects of effort praise are equivocal. Is effort praise motivational or not? This is a bewildering question that has significant implications for educational practices. A constructive approach to this question is to sort out the conditions in which effort praise has or does not have positive effects. In the past, researchers have identified two conditions that account for inconsistent findings about the effects of effort praise; namely the type of involvement and the presence of subsequent setbacks.

Involvement and Setbacks

In an experiment with college students, Koestner and his colleagues (1987) found an interesting interaction between type of involvement and praise. They found that the students who received effort praise were relatively more intrinsically motivated under task-involving than ego-involving situations. However, they also found that the students who received ability praise were relatively more motivated under ego-involving than task-involving situations. According to Nicholls (1984), the goal in a task-involving situation is to master the task, such as greater understanding of subject matter or better acquisition of new skills. This is similar to learning-goal orientation (Dweck, 1986), that focuses on the enhancement of one's skills and mastery of the task. In contrast, the goal in an ego-involving situation is to demonstrate high ability relative to others or to conceal low ability. This is similar to performance-goal orientation (Dweck, 1986), that focuses on getting positive evaluation or avoiding negative evaluations of one's ability. It is understandable that ability praise, which encourages ability attribution, would be more motivational than effort praise for students who try to prove their ability in ego-involved situations. Similarly, it is also understandable that effort praise, which encourages effort attribution, will be more motivational than ability praise for students who try to enhance their skills or master the task by working hard in task-involving situations.

The presence of subsequent setbacks is another condition that can explain the positive or lack of positive effects of effort praise. In the studies that indicated the superiority of effort praise over ability praise (e.g., Mueller & Dweck, 1998; Kamins & Dweck, 1999), children's motivational responses were measured after they were first exposed to success and then failure experiences. In contrast, in the studies that indicated the superiority of ability praise over effort praise (e.g., Schunk, 1982, 1983; Koestner, et al., 1987), failure experience was not included and children's motivation responses were measured right after a success experience. This difference is crucial to explaining the inconsistencies in the positive effects of effort praise versus ability praise. Ability praise enhances self-efficacy and motivation because it conveys a strong message of personal competence when it is paired with success. Its positive effects on self-efficacy and motivation can be greater than the effects of effort praise. However, it may also convey a strong message of personal incompetence in case of subsequent setbacks. Children who have been praised for ability may lose motivation when they attribute subsequent setbacks to low ability. In contrast, children who have been praised for effort will remain persistent in the face of subsequent setbacks because they have learned to attribute their learning outcomes to effort. As effort is something internal and controllable, these children's self-efficacy and intrinsic motivation will not be diminished after failure.

The type of involvement and the presence of subsequent setbacks have been shown to explain the inconsistent findings about the positive effects of effort praise. However, we believe that there are some other important conditions that have been overlooked in the literature. Like the two identified conditions, these may also moderate the effects of effort praise on motivation although they have not attracted much attention from researchers. One of these neglected conditions is beliefs in the relationship between effort and ability.

Beliefs in the Effort and Ability Relationship

Children may espouse two different beliefs in the relationship between effort and ability. They may believe that effort and ability are related inversely (the inverse rule), that is, the less one's ability, the more one has to make an effort for success. On the other hand, they may believe that effort and ability are related positively (the positive rule), that is, the more one exerts effort, the higher is one's ability. We speculate that if children believe the inverse rule, they will be discouraged when they get effort praise because high effort implies low ability. In contrast, we speculate that if children believe the positive rule, they will be motivated when they get effort praise because high effort implies high ability.

Many researchers have found a developmental trend in how children perceive the relationship between effort and ability. Barker and Graham (1987) found that younger children tended to espouse the positive rule but older children tended to espouse the negative rule. The 5-year old children in their study believed that a hardworking child was also a competent child. The correlation between their effort and ability judgments of a child portrayed in a successful scenario was .85. This showed that they believed greater effort implied greater ability. However, the positive correlation between effort and ability judgments dropped to .24 among the 9-year old children and even turned into a negative correlation of $-.79$ among the 11-year old children. The negative correlation among the older children indicated a belief that greater effort implied lower ability. This developmental trend has been found by many other researchers (e.g., Meyer et al., 1979; Nicholls, 1978). It is quite clear that young children (at ages younger than 11) usually view effort and ability as being related positively, whereas older children (at ages older than 11) view effort and ability as being related negatively.

Nicholls (1989) argues that this developmental trend is due to the cognitive

maturity of the older children who can master the Hederian logic (Heider, 1958). The older children are able to conceive of ability as capacity and to understand that the effects of effort on performance relative to others are limited by capacity. However, younger children may not master the Hederian logic and do not understand that, in order to achieve the same successful outcome, a child with high ability does not need to make extra effort but a child with low ability has to do so. The change of reasoning about effort and ability usually occurs between 10 and 12 years of age. However, we do not think that the endorsement of the positive or inverse rules in the effort-ability relationship is merely a function of cognitive maturity. We argue that it can be a cultural or individual difference.

Using procedures similar to those used in Barker and Graham (1987), Salili and Hau (1994) found a positive correlation between ability and effort judgments among Chinese children (between 7 to 15 years old). The Chinese children in their study thought that the more hardworking students were always more able and vice versa. This positive relationship was strong even among the children at ages older than 11. The cognitive maturity theory cannot explain the findings of Salili and Hau (1994) because there is no evidence of deficiency among Chinese children in mastering Hederian logic and achievement-related concepts. Hong (2001) argues that the tendency for Chinese children to endorse the positive rule may be a result of a cultural norm. The Chinese culture is well known for its strong emphases on the exertion of effort (Li, 2001, 2002; Tao & Hong, 2000). Chinese children are well aware of the importance of hard work. The positive connotation of effort may have made the positive rule of the effort-ability relationship readily accessible to Chinese children. As Salili and Hau (1994) argue, Chinese children, unlike their Western counterparts, believe that “people working hard have higher ability and those who have high ability must have worked hard” (p. 233).

However, there is evidence showing individual differences in the beliefs about effort-ability relationship within cultures. Hong (2001) found that some Chinese teachers in Hong Kong endorsed the positive rule whereas others endorsed the inverse rule. Similarly, individual differences were also found in American adult samples (Surber, 1984). These within-culture differences among adults are unlikely to be due to cognitive immaturity or cultural differences. These individual differences may arise from the emphases on the different temporal perspectives pertaining to the effort and ability relationship. As shown in Figure 1a, if people adopt a static perspective and focus on only one time (Time 1), they will easily see the inverse relationship between effort and ability. In a static perspective, what happens in the future (Time 2) is out of concern. Because changes from Time 1 to Time 2 are not considered, people with a static perspective tend to focus on the relative contribution of effort and ability to the achievement of a task here and now, i.e., Time 1 only. As long as they master Hederian logic, they can figure out that a person with less ability needs to work harder to achieve the same performance level of another person with more ability. The subscription to the inverse rule is the corollary of a static perspective that does not consider changes of ability over time. However, when people adopt a dynamic perspective and take account of future development (Time 2), they will see a positive relationship between effort and ability (see Figure 1b). That is, the more a person works hard in Time 1, the more competent he/she will be in Time 2. In the same vein, a person whose ability is high in Time 2 must have worked hard in Time 1. When people do not restrict their attention to the completion of a task here and now, they can cast their sight to the future development of their ability and see that their current effort will enhance their future ability in doing a similar task. A dynamic perspective that considers changes of ability over time is facilitative to the positive rule of the effort-ability relationship.

Overview of the Present Research

We argue that beliefs in the effort-ability relationship may be subject to individual differences. These individual differences can moderate the effects of effort praise on motivation. When students adopt a static perspective and focus on the inverse relationship between effort and ability, they will be discouraged when they receive effort praise because high effort implies low ability. In contrast, when students adopt a dynamic perspective and focus on the positive relationship between effort and ability, they will be encouraged when they receive effort praise because high effort implies high ability. In the present research we conducted two studies to examine these hypotheses. In Study 1 we measured participants' beliefs in the effort-ability relationship with a questionnaire, whereas in Study 2 we manipulated their beliefs with a priming procedure. In both studies we expected that participants who believed or were led to believe in the inverse rule would have lower self-evaluation and less intrinsic motivation after effort praise than their counterparts who believed or were led to believe in the positive rule.

Study 1

Method

Participants

The participants were 34 7th graders from a Hong Kong secondary school in a middle-lower class neighborhood. They participated in the study voluntarily with parental consent. The data of six participants were excluded as they had poor performances in the experimental task and therefore were not praised. As a result, the final data set consisted of 28 students (15 boys and 13 girls).

Procedures

The study was conducted in a group setting after school on a normal school day. The students gathered in their classroom and sat in their usual workplaces. They were

told that the study was investigating how they thought about learning Chinese idioms and how good they were at it. They were asked to complete two Chinese idiom anagrams and then a questionnaire that assessed their attitudes toward learning Chinese idioms. When the students had completed the first anagram, a research assistant collected all the answer sheets and allegedly took them to another classroom for scoring. They were told that their performance on this anagram would be scored by a computer scanner and the results would be available later. Meanwhile, they were given a second anagram to work on. Upon completion of this second anagram, the research assistant re-entered the classroom and distributed the alleged results of the first anagram to the participants. All the students, except six who did not have 40% or above accuracy, received a result slip stating, "*You have found more than 70% of the hidden Chinese idioms. This is a good result and reflects that you have worked hard.*" Praise was withheld from the students who had poor performance so as to ensure the authenticity of the praise. These students were given a result slip stating that they had found 50% of the hidden Chinese idioms and were not praised. After receiving the result slips, all the students were asked to complete a questionnaire that tapped their intrinsic motivation, self-evaluation, and beliefs about the relationship between effort and ability. After that, the students were debriefed fully about the real purpose of the study. They were told that the real purpose was to investigate the role of beliefs in the effort-ability relationship on motivation. They were also told that the result slips did not reflect their performances accurately and that almost all students got the same feedback.

Materials

Chinese idiom anagrams. The students were asked to search for the Chinese idioms hidden in a 7 x 7 matrix of 49 Chinese characters. Each idiom consisted of four Chinese characters. They might be read horizontally, vertically or diagonally in

this matrix. This task was chosen because it was difficult for students to ascertain whether they had exhausted all the hidden idioms. As it seemed to have endless combinations of four characters in the matrix, we could easily manipulate the feedback on performance. Students who had made an effort in the task would believe readily that they had found more than 70% of the hidden idioms. However, if students did not make an effort or did poorly in task, the good performance feedback might not be convincing. To play safe, we did not provide good performance feedback and praise to the students who did not have 40% or above accuracy.

Measures

Self-evaluation. The students' self-evaluation was measured after the effort praise. Three sets of questions that were modeled after the format of Henderson and Dweck's (1989) Self-confidence Scale were presented. Each set of questions consisted of two contrasting statements that were related to the result of the anagram (1. *I am quite a failure vs. I am quite successful*; 2. *I am not smart enough vs. I am pretty smart*; 3. *I am brighter than other classmates vs. I am dumber than other classmates*). The students were asked to choose the statement that described them best. Then, they were asked to rate how true the chosen statement was for them on a scale ranging from 1 (very true) to 3 (sort of true). Responses were later recoded into a 6-point scale according to the procedure suggested by Henderson and Dweck (1989). If a student chose "I am quite successful" and then "very true" for Item 1, his/her score for this item would be coded as 6. In contrast, if a student chose "I am quite a failure" and then "very true" for this item, his/her score would be coded as 1. A higher score indicated more positive self-evaluation. The alpha coefficient of the three scores was .68 in this sample. The three scores were averaged and formed a single self-evaluation index. A high score indicated positive self-evaluation whereas a low score indicated negative self-evaluation.

Intrinsic motivation. After receiving the effort praise for their performance on the first anagram, the students were asked to indicate how interesting the Chinese idiom anagram was on a scale ranging from 1 (very uninteresting) to 6 (very interesting). A high score indicated high intrinsic motivation in doing the anagram task.

Beliefs in the effort-ability relationship. At the end of the questionnaire, the participants were presented with four items that allegedly assessed their opinions about learning. Actually two of them assessed their beliefs in the relationship between effort and ability. Another two were filler items that helped to make the cover story convincing (e.g., “*If a subject is difficult, would you give up easily?*”). The item that measured the belief in the inverse rule was “*If you work very hard and then receive a good result, how much does this indicate that you are smart?*” The participants were asked to respond on a 6-point scale ranging from 1 (not very smart) to 6 (very smart). For the sake of easy interpretation, the scores were coded in reverse so that the higher ratings reflected lower agreements to smartness and greater endorsements of the inverse rule between effort and ability. The item that measured the belief in the positive rule was “*If you work very hard, will you become smarter?*” The participants were asked to respond on a 6-point scale ranging from 1 (definitely will not) to 6 (definitely will). The higher ratings reflected higher agreement to smartness and greater endorsement of the positive rule between effort and ability. The scores of the inverse rule and positive rule were correlated negatively ($r = -.51, p = .005$) in this sample. We subtracted the score of the inverse rule from that of the positive rule and obtained a single score that reflected the participants’ beliefs in the effort-ability relationship. Positive scores indicated the endorsement of the positive rule more than the inverse rule. In contrast, negative scores indicated the endorsement of the inverse rule more than the positive rule.

Results

Correlations among the Variables

Table 1 presents the descriptive statistics of the variables in Study 1. It also presents the correlation coefficients among these variables. On average, the students endorsed the positive rule more than the negative rule because the mean score of their beliefs in the effort-ability relationship was positive ($M = .36$, $SD = 2.36$). As predicted, we found that their beliefs about the effort-ability relationship correlated significantly with their self-evaluations ($r = .47$, $p < .05$). The more the students endorsed the positive rule versus the inverse rule, the more they would feel that they were successful, smart, and brighter than their fellow students after the effort praise. In other words, the more the students endorsed the inverse rule versus the positive rule, the more they would evaluate themselves negatively after the effort praise. We also found that their beliefs in effort-ability relationship correlated significantly with their intrinsic motivation ($r = .38$, $p < .05$). The more the students endorsed the positive rule versus the inverse rule, the more they would feel that the Chinese idiom anagram was interesting.

Discussion

The present study showed that effort praise could be de-motivational when the recipients believed in an inverse relationship between effort and ability. However, it also showed that effort praise could be motivational when the recipients believed in a positive relationship between effort and ability. As predicted, the more the students believed the inverse rule, the less they would have positive self-evaluation and intrinsic motivation after effort praise. That is, the more the students believed the positive rule, the more they would have positive self-evaluation and intrinsic motivation after effort praise. In sum, effort praise is not always motivational. It depends on the recipients' beliefs in the relationship between effort and ability. The findings of the present study support the argument that praise is a complex social

phenomenon and its effects are moderated by people's cognitions (Emmer, 1987; Henderlong & Lepper, 2002; Kanouse, Gumpert, & Ganavan-Gumpert, 1981).

The study was conducted in the students' regular classroom. The typical classroom context thus increased its ecological validity. The findings are representative of what happens in a real classroom. They are related to phenomena that actually occur in the real world. One may argue that findings in a laboratory cannot be generalized into real classrooms. Since the present study was conducted in a regular classroom setting, the results are therefore useful to frontline educators, who are concerned with the external validity of research in teaching practices.

Although the present study has its merits and has shed light on the importance of effort-ability relationship beliefs, it has many limitations. First, it is a study with correlational data about the participants' beliefs in the effort-ability relationship. As we did not manipulate the participants' beliefs, we could hardly establish any causal relationship among effort praise, beliefs, and motivational responses. Second, we measured participants' beliefs about the effort-ability relationship after the effort praise. It is uncertain if their beliefs had been affected by the effort praise. In addition, the motivational responses in the present study only included self-report measures of intrinsic motivation and self-evaluation. No behavioral measure of motivation was included. To address these limitations, we conducted Study 2. In Study 2, we manipulated the participants' beliefs in the effort-ability relationship before they were exposed to effort praise. We also included a behavioral indicator of their motivation after effort praise.

Study 2

Method

Participants

The participants were 45 7th graders from a Hong Kong secondary school in a

middle-lower class neighborhood. With the help of the school personnel, invitation letters were sent home to all the 7th graders (N = 150). Parents were informed that we invited their children to participate in our study that would be conducted during the extra-curricular activities period at the end of the school year. They were also informed that participants could attend a free educational workshop on learning motivation after the study was completed. With parental consent, forty-five students volunteered to participate. Two students were excluded from data analyses because the manipulation was not successful with them. One did not agree to the priming materials and the other did not have 40% or above accuracy in the experimental task. As a result, the final data set consisted of 43 students (25 boys and 18 girls). By random assignment, 21 were in the positive rule condition and 22 were in the inverse rule condition.

Procedures

In Hong Kong, most schools set aside the last two weeks before the summer vacation for a wide diversity of extra-curricular activities. The experiment was conducted on individual bases in the students' school on two consecutive Saturdays during this period. Participation in this experiment was considered as one of the many extra-curricular activities from which the students could choose. An experimenter worked with one student at a time in a classroom. The students were told that the purpose of the study was to investigate the literacy performance and motivation of 7th graders in Hong Kong. They were requested to engage in three activities within 30 minutes: First, a Chinese idiom anagram; second, a reading comprehension exercise; and third, a self-selected exercise.

The Chinese idiom anagram was described as a task that required smartness as well as good effort. After the students had completed the anagram, they were given a comprehension exercise to work on while the experimenter was scoring the anagram.

This comprehension exercise was actually a priming task. On a random basis, half of the students were primed with the positive rule and the other half were primed with the inverse rule. Upon the completion of this alleged comprehension exercise, the students received their scored anagrams from the experimenter. The correct idioms were ticked off. The experimenter then gave the following feedback to every student: *“You did quite well. You found most of the embedded idioms because you have worked hard. From my observations, I bet you work hard at other times too.”* To ensure that it was indeed a successful experience for all the participants, one participant who identified less than 40% of the total idioms was excluded from further analyses.

After the effort praise, the experimenter asked the students to complete a questionnaire before they proceeded to the third task, a self-selected exercise. The questionnaire included items that measured self-evaluation and intrinsic motivation. After the students had completed the questionnaire, they were presented with another Chinese anagram and a Chinese word puzzle. The experimenter described that these two tasks were at similar levels of difficulty. The students could choose to work on either one of them. After the students had made a choice, the experimenter looked at the clock and said that, due to the time constraints, they did not have time for this third task. The students were then debriefed fully before they left the room. The experimenter apologized for the deception and explained its rationale as well as the design of the experiment. The students in the inverse rule condition were particularly told that many people might not agree to the arguments in the article. Three months later, the experimenter re-visited the school and presented the results to all the participants in a workshop for educational purposes. They were informed of the consequences of the different beliefs for the relationship between effort and ability.

At the end of the experiment, the experimenter asked the participants not to discuss the tasks with their friends. To make sure that no students had heard about the

details of the experiment from their friends, each participant was asked to guess the number of candies in a bottle on the desk of the experimenter. After the participants made a guess, the experimenter told them that there were 37 candies. Any participant who could give the correct answer would be excluded from the study because they might have heard about the details of the experiment. In the present study, no participant could tell the correct answer hence no participant was excluded for this reason.

Materials

Chinese idiom anagram. The anagram was similar to those used in Study 1. The students were asked to search for the Chinese idioms embedded in a 9 x 13 matrix of 117 Chinese words.

Chinese crossword puzzle. A Chinese crossword puzzle was used as the alternative of the Chinese idiom anagram in the self-selected exercise. The students were asked to insert words horizontally and vertically according to the numbered clues provided. This task was chosen because it had a similar format to the anagram but different content and rules.

Priming materials. The method of manipulation was similar to the one adopted by Hong, Chiu, Dweck, Lin, and Wan (1999). The students were required to read an article of approximately 800 words that advocated either the inverse rule or the positive rule in the reading comprehension exercise. The inverse rule article put forward the inverse relationship between effort and ability by emphasizing that a person with less ability made more effort to complete a job that could be completed easily by a person with more ability. It stated in the conclusion, "If a person is less able, he/she needs to make more effort." In contrast, the positive rule article put forward the positive relationship between effort and ability by emphasizing that more effort would help enhance one's ability. It stated in the conclusion, "If a person works

really hard, his/her ability will be enhanced.”

Measures

Manipulation checks. A comprehension test was presented to the students after they had read the article. The students were asked to complete three multiple-choice questions and two fill-in-the-blanks items. If the students could give accurate answers, that meant they understood the article accurately. To check further if the students in the two conditions perceived the two articles as equally comprehensible, we asked them how much they agreed that the article they had just read was easy to understand. To check if the manipulation of beliefs in the effort-ability relationship was successful, we asked the students to indicate how much they agreed to the viewpoints presented in the article. Their responses to these two questions were made on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree).

Self-evaluation. This was measured by the three sets of questions that had been used in Study 1. The alpha coefficient of the three scores was .73 in the current sample. A low score indicated a poor evaluation of oneself whereas a high score indicated a high evaluation of oneself.

Intrinsic motivation. Like their counterparts in Study 1, the students in this study were asked to indicate how interesting the Chinese idiom anagram was on a scale ranging from 1 (very uninteresting) to 6 (very interesting). A high score indicated high intrinsic motivation in the anagram task.

Task choice. The students were asked to choose between a Chinese idiom anagram and a Chinese crossword puzzle for the self-selected exercise after the effort praise. If the students chose to work on the anagram again, it indicated that they had a strong interest in this task. If the students chose to work on the crossword puzzle, it indicated that they had lost interest in the anagram and wanted to try something else. The choice made by the students was a behavioral indicator of their motivation in the

anagram task.

Results

Manipulation Checks

To examine whether the two conditions differ in the three manipulation measures, we conducted three two-tailed t-tests. All the tests yielded non-significant results. There was no significant difference in the accuracy rates in the comprehension test between the positive rule condition ($M = 95\%$, $SD = 8.73$) and the inverse rule condition ($M = 90\%$, $SD = 14.80$); $t = 1.42$, $p > .05$, $df = 41$, Cohen's $d = .41$. Similarly, there was no significant difference in the perceptions of comprehensibility of the articles between the positive rule condition ($M = 4.91$, $SD = .89$) and the inverse rule condition ($M = 4.64$, $SD = .66$), $t = 1.13$, $p > .05$, $df = 41$, Cohen's $d = .35$. In addition, the students from both conditions agreed equally to the viewpoints presented by the articles, $t = .42$, $p > .05$, $df = 41$, Cohen's $d = .13$. There was no significant difference in the extent of agreement between the positive rule condition ($M = 4.95$, $SD = .81$) and the inverse rule condition ($M = 4.86$, $SD = .56$). These results indicated that the students in the two conditions obtained equally high accuracy in the comprehension test and perceived the two articles to be equally comprehensible. More importantly, the results showed that the priming of beliefs in the effort-ability relationship was successful for both conditions.

Self-evaluation

As expected, the students in the positive rule condition reported higher self-evaluation after the effort praise ($M = 4.44$, $SD = .47$) than did their counterparts in the inverse rule condition ($M = 3.91$, $SD = .83$), $t = 2.58$, $df = 41$, $p < .05$, Cohen's $d = .79$.

Intrinsic Motivation

The students in the positive rule condition found the anagram more interesting

after the effort praise ($M = 4.67$, $SD = .66$) than did their counterparts in the inverse rule condition ($M = 4.23$, $SD = .69$), $t = 2.14$, $df = 41$, $p < .05$, Cohen's $d = .65$.

Task Choice

In the positive condition, three students chose the crossword puzzle and 18 chose the anagram. In the inverse rule condition, nine students chose the crossword puzzle and 13 chose the anagram. A chi-square test showed a marginally significant difference between the two conditions in the task choice, $X^2(1, 42) = 3.79$, $p = .05$. As shown in Figure 2, the proportion of students who chose to stay with the anagram after the effort praise was higher in the positive rule condition than in the inverse rule condition. In other words, more students in the inverse rule condition than in the positive rule condition lost interest in the anagram after the effort praise.

Discussion

The results of Study 2 were consistent with our hypotheses. Depending on beliefs in the effort-ability relationship, effort praise might decrease or increase one's self-evaluation and intrinsic motivation. The students who were led to believe in the positive rule had more positive self-evaluation and higher motivation after effort praise than their counterparts who were led to believe in the inverse rule. Their higher motivation was reflected in both their self-report and actual choice of task at the end of the experiment. The explanations behind these findings are straightforward. When students believe that high effort implies high ability, effort praise confirms their sense of competence and subsequently enhances their self-evaluation. As perceptions of competence are related to higher levels of intrinsic motivation (Bandura & Cervone, 1983; Deci & Ryan, 1985), these students will find the given task interesting and are willing to do it again. In contrast, when students believe that high effort implies low ability, they will be discouraged by effort praise. They interpret the praise as a cue of their incompetence and thus lose interest and confidence in doing the given task

again.

Findings in the present study were consistent with those of Study 1 although a different research method was employed. Unlike Study 1, this study was an experiment with the manipulation of beliefs in the effort-ability relationship. With this research design, we have been able to ascertain the causal relationship among the beliefs, effort praise and motivational responses.

General Discussion

Effort praise has been used extensively by adults to influence children's behavior. It is important for researchers and educators to understand how it affects children's motivation. Past research has shown inconsistent findings about the effects of effort praise on children's motivation. We agree with Henderlong and Lepper (2002) that praise is a complex social phenomenon and its effects are subject to many conditions. Therefore, it is more useful to ask about the conditions under which effort praise can be beneficial or detrimental than to ask whether effort praise is motivational. The current research has contributed to this line of research by showing that beliefs in the effort-ability relationship moderate the effects of effort praise on children's motivation.

Previous studies have identified the type of involvement (Koestner et al., 1987) and the presence of subsequent setbacks (Muller & Dweck, 1998; Kamins & Dweck, 1999) as two conditions that account for the inconsistent findings about effort praise. So far, little attention has been given to how beliefs in the relationship between effort and ability may explain the inconsistent effects of effort praise. In view of this lacuna, we set out to investigate how beliefs in the effort-ability relationship moderated the effects of effort praise on student motivation. With both correlational and experimental data, our research indicates that effort praise is motivational for the people who believe that effort and ability are related positively but de-motivational

for the people who believe that effort and ability are related negatively. In other words, the effects of effort praise can be positive or negative, depending on the recipients' beliefs in the effort-ability relationship. These findings help to disentangle the complexity and inconsistency about the effects of effort praise. They have significant implications for the use of effort praise as a means to influence children's motivation.

Despite good intentions, effort praise may serve as a low-ability cue for people who believe in an inverse relationship between effort and ability. This belief may be particularly detrimental to Chinese children, who grow up in a culture that has a strong emphasis on effort exertion. Previous research (e.g., Stevenson & Lee, 1990; Stevenson & Stigler, 1992) has shown that Chinese parents and children are more likely than their American counterparts to attribute academic achievement to effort. If high effort implies low ability, effort praise will be particularly harmful to Chinese children. Hong (2001) has argued that effort attribution may not be a blessing to Chinese children if they believe in the inverse rule of the effort-ability relationship. The cultural emphasis on effort exertion has pressured Chinese children to study for long hours (Salili, Chiu, & Lai, 2001). However, the pressure to work hard may be accompanied by a sense of incompetence if Chinese children believe in the inverse rule of the effort-ability relationship. Fortunately past research (Salili & Hau, 1994) has shown that Chinese children tend to endorse the positive rule even from the age of 11. In the present research, the participants in Study 1 also endorsed the positive rule more than the negative rule in general. However, we have to acknowledge that there are individual differences within the Chinese culture. In Study 1, the standard deviation of beliefs in the effort-ability relationship was 2.36, indicating a substantial variation among the participants. Similarly, Hong (2001) also found in her study that a considerable number of Chinese children subscribed to the inverse rule. These

Chinese children would be most vulnerable to the detrimental effects of effort praise.

To capitalize on the positive effects of effort praise, parents and teachers need to promote the positive rule of the effort-ability relationship among children. Brief indoctrination in the positive rule is not effective in changing children's beliefs. In Study 2, we led the students to believe in either the positive or inverse rules by presenting arguments in an article. However, the priming effect is usually transient and the manipulation we used did not have long-term effects on the students. The endorsement of a certain belief is a result of long-term cultivation in day-to-day real-life experience. We argue that the belief in positive rule is associated with a dynamic temporal perspective whereas the belief in negative rule is associated with a static temporal perspective. It is highly possible that a static temporal perspective is fed by performance-oriented contexts. When children are led constantly to focus on the evaluation of their ability relative to others, they are more likely to be fixated on the imminent comparison here and now (see Figure 1a). In contrast, when children are led to focus on their learning, they are more likely to cast their eyes at the future development of their skill acquisition and task mastery. After all, learning is a process of change and it is acquired through experience over time (see Figure 1b). Past research has shown that belief in the inverse rule is associated with performance goal rather than learning goals (Hong, 2001; Leggett & Dweck, 1986). There is also evidence showing that children in a country with more external evaluations at young ages tended to have greater endorsement of the inverse rule than children in a country with less external evaluations at young ages (Kurtz-Costes, McCall, Kinlaw, Wiesen, & Joyner, 2005).

The results of the present research and the link between the inverse rule and external evaluations can serve to prompt educators to rethink the world-wide education reforms that have strong emphasis on accountability. At the turn of the

millennium, the United States passed, as a federal law, the “No Child Left Behind Act” (Public Law 107-110). About the same time, Hong Kong initiated a large-scale education reform concerning all stages of education from early childhood to continuing adult education (Education Commission, 2000). These reforms share the same agenda to improve student performance by increasing the standards of accountability for schools. However, the high-stake testing for accountability may contribute to a performance-oriented environment that promotes the inverse rule of effort-ability relationship among children.

Perhaps the most effective way to promote the positive rule among children is to provide them with a learning-oriented environment that is free from unnecessary competition and external evaluation. If evaluations are made, it would be better to lead children to focus on improving their own ability instead of comparison of their ability with others. Self-referenced assessment, criteria assessment and portfolio assessment may direct children’s attention from performance goals to learning goals. These assessment methods may help students to adopt the positive rule instead of the inverse rule.

Despite the contributions and implications mentioned above, a number of limitations warrant interpreting the current findings with caution, suggesting directions for future research. First, the sample sizes of both Studies 1 and 2 were relatively small. We expect that future studies with bigger sample sizes will yield more stable results. Second, we did not include baseline measures in Study 2 and only relied on random assignment to control the possible pre-effort praise differences in the two conditions. We expect that an inclusion of baseline measures will help strengthen the internal validity of future studies.

Given the importance of beliefs in the effort-ability relationship, researchers need to conduct more research to identify the instructional practices that will promote the

positive rule rather than the inverse rule. We speculate that the positive rule is promoted by learning-oriented contexts whereas the inverse rule is promoted by performance-oriented contexts. However, the results of our present studies did not provide evidence for such a speculation. We included neither goal orientations nor the learning environment in our purview of investigation. To address this limitation, future studies may examine how goal orientations and learning environment are related to beliefs in the effort-ability relationship. We need more studies that can tell precisely what instructional practices will constitute learning-oriented contexts and how these instructional practices will lead students to adopt learning goals and a more dynamic temporal perspective of the effort-ability relationship.

Conclusion

The present research reveals the importance of beliefs in the effort-ability relationship. It shows that these beliefs moderate the effects of effort praise on children's motivation. Effort praise can be motivational when the recipient believes in a positive relationship between effort and ability. However, it can be de-motivational when the recipient believes in an inverse relationship. The present research has made a unique contribution to the existing body of knowledge by identifying a condition that can explain the inconsistency about the positive effects of effort praise. The findings have significant implications for educational practice. They can help parents and educators to capitalize on the positive effects of effort praise on children's motivation.

References

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology*, 45, 1017-1028.
- Barker, G. P., & Graham, S. (1987). Developmental study of praise and blame as attributional cues. *Journal of Educational Psychology*, 79, 62-66.
- Brophy, J. (1981). Teacher praise: A functional analysis. *Review of Educational Research*, 51, 5-32.
- Deci, E., & Ryan, R. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist*, 41, 1040-1048.
- Education Commission (2000). *Learning for life, learning through life: Reform proposal for the education system in Hong Kong*. Hong Kong: Government Printer.
- Emmer, E. T (1987). Praise and the instructional process. *Journal of Classroom Interaction*, 23, 32-39.
- Hau, K. T., & Salili, F. (1996). Motivational effects of teachers' ability versus effort feedback on Chinese students' learning. *Social Psychology of Education*, 1, 69-85.
- Hedier, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.
- Henderlong, J., & Lepper, M. R. (2002). The effects of praise on children's intrinsic motivation: A review and synthesis. *Psychological Bulletin*, 128, 774-795.
- Henderson, V. L., & Dweck, C. S. (1990). Achievement and motivation. In S.

- Feldman and G. Elliott (Eds.), *At the threshold: The developing adolescent* (pp.308-329). Cambridge, MA: Harvard University Press.
- Hitz, R., & Driscoll, A. (1988). Praise or encouragement? New insights into praise: Implication for early childhood teachers. *Young Children, July*, 6-13.
- Hong, Y. (2001). Chinese students' and teachers' inferences of effort and ability. In F. Salili, C. Y. Chiu & Y. Hong (Eds.), *Student motivation: the culture and context of learning* (pp. 105-120). New York: Kluwer Academic/Plenum.
- Hong, Y., Chiu, C., Dweck, C. S., Lin, D. M., & Wan, W. (1999). Implicit theories, attributions, and coping: A meaning system approach. *Journal of Personality and Social Psychology, 77*, 588-599.
- Kamins, M. L., & Dweck, C. S. (1999). Person versus process praise and criticism: Implications for contingent self-worth and coping. *Developmental Psychology, 35*, 835-847.
- Kanouse, D. E., Gumpert, P., & Ganavan-Gumpert, D. (1981). The semantics of praise. In J. H. Harvey, W. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research* (pp. 97-115). Hillsdale, NJ: Erlbaum.
- Koestner, R., Zuckerman, M., & Koestner, J. (1987). Praise, Involvement, and Intrinsic Motivation. *Journal of Personality and Social Psychology, 53*, 383-390.
- Kurtz-Costes, B., McCall, R., Kinlaw, C.R., Wiesen, C.A. & Joyner, M.H. (2005). What does it mean to be smart? The development of children's beliefs about intelligence in Germany and the United States. *Journal of Applied Developmental Psychology, 26*, 217-233.
- Leggett, E., L., & Dweck, C. S. (1986). Individual differences in goals and inference rules; Sources of causal judgments. Unpublished manuscript.
- Li, J. (2001). Chinese conceptualization of learning. *Ethos, 29*, 111-137.

- Li, J. (2002). A cultural model of learning: Chinese “heart and mind for wanting to learn.” *Journal of Cross-Cultural Psychology*, *33*, 246-267.
- Meyer, W., Bachmann, M., Biermann, U., Hempelmann, M., Plöger, F., & Spiller, H. (1979). The informational value of evaluative behavior: Influences of praise and blame on perception of ability. *Journal of Educational Psychology*, *71*, 259-268.
- Miller, R. L., Brickman, P., & Bolen, D. (1975). Attribution versus persuasion as a means for modifying behavior. *Journal of Personality and Social Psychology*, *31*, 430-441.
- Mueller, C. M., & Dweck, C. S. (1998). Praise for Intelligence can undermine motivation and performance. *Journal of Personality and Social Psychology*, *75*, 33-52.
- Nicholls, J. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. *Child Development*, *49*, 800-814.
- Nicholls, J. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice and performance. *Psychological Review*, *91*, 328-346.
- Nicholls, J. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, *91*, 328-346.
- Nicholls, J. G. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. *Child Development*, *49*, 800-814.
- Nicholls, J. G. (1989). *The competitive ethos and democratic education*. London: Harvard University Press.

- Salili, F., & Hau, K. T. (1994). The effect of teachers' evaluative feedback on Chinese students' perception of ability: A cultural and situational analysis. *Educational Studies, 20*, 223-236.
- Salili, F., Chiu, C. Y., & Lai, Simon. (2001). The influence of culture and context on students' motivational orientation and performance. In F. Salili, C. Y. Chiu & Y. Y. Hong (Eds.), *Student motivation: the culture and context of learning* (pp. 221-247). New York: Kluwer Academic/ Plenum.
- Schunk, D. H. (1982). Effects of effort attributional feedback on children's perceived self-efficacy and achievement. *Journal of Educational Psychology, 74*, 548-556.
- Schunk, D. H. (1983). Ability versus effort attributional feedback: Differential effects on self-efficacy and achievement. *Journal of Educational Psychology, 75*, 848-856.
- Stevenson, H. W., & Stigler, J. W. (1992). *The learning gap: Why our schools are failing and what we can learn from Japanese and Chinese education*. New York: Simon & Schuster.
- Stevenson, H. W., Stigler, J. W., Lee, S., Lucker, G., Kitamura, S., & Hsu, C. (1985). Cognitive performance and academic achievement of Japanese, Chinese, and American children. *Child Development, 56*, 718-734.
- Surber, C. F. (1984). Inferences of ability and effort: Evidence for two different processes. *Journal of Personality and Social Psychology, 46*, 249-264.
- Tao, V., & Hong, Y. (2000). A meaning system approach to Chinese students' achievement goals. *Journal of Psychology in Chinese Societies, 1*, 13-38.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548-573.

Table 1

Descriptive Statistics and Correlations among the Variables in Study 1 (N = 28)

Variables	Mean	SD	Range	1	2	3
1. Beliefs in the Effort-Ability Relationship	.36	2.36	-5 to 5	--		
2. Self-Evaluation	3.55	1.10	1 to 6	.47*	--	
3. Intrinsic Motivation	3.25	1.46	1 to 6	.38*	.18	--

* $p < .05$

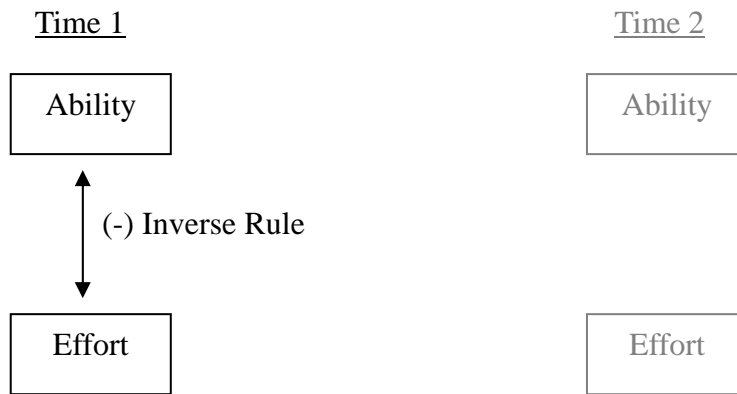


Figure 1a. Static perspective and the belief in inverse relationship between effort and ability.

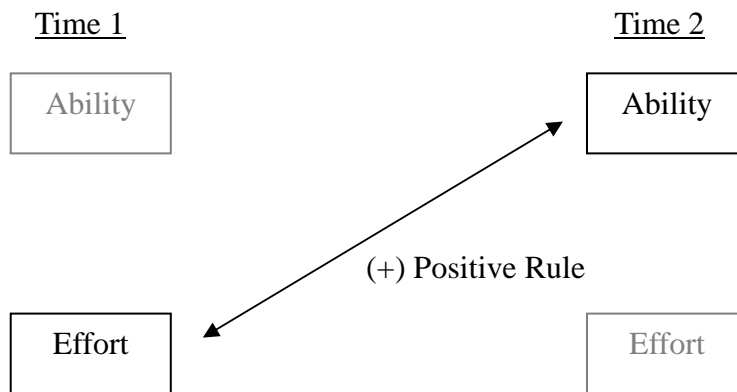


Figure 1b. Dynamic perspective and the belief in positive relationship between effort and ability.

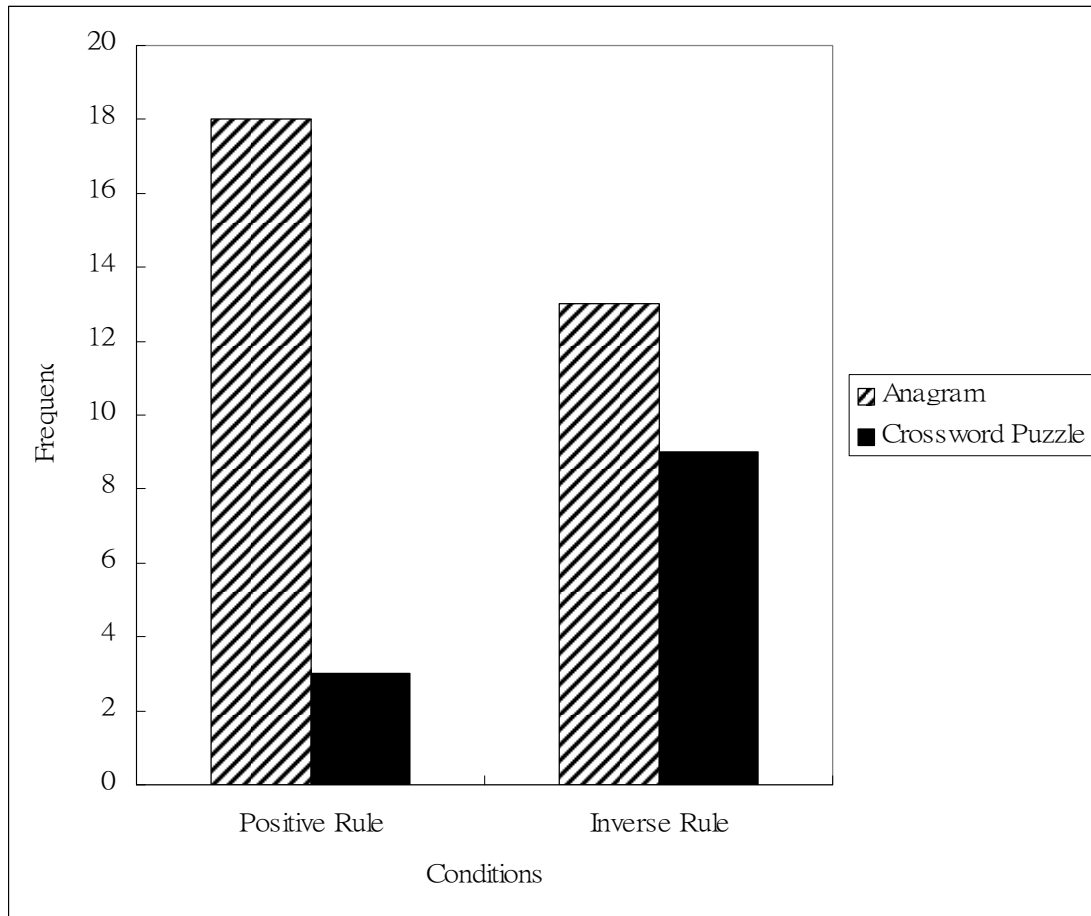


Figure 2. Number of students who chose anagram and crossword puzzle after effort praise in Study 2 (N = 43).