



The Effect of Overconfidence on Persistent Behavior: The Mediation Effect of “I Think I Can Do It” Rather Than “I’m Attracted To It”

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Abstract

The present study explored the effects of state overconfidence on persistent behavior with consideration of feasibility and desirability as mediators. The persistent behaviors of 61 participants (35 women, 26 men; M age = 20.9 yr, $SD = 1.9$), placed in overconfidence and under-confidence groups based on random positive or negative bogus feedback, were measured. Results showed that participants with overconfidence were more persistent in solving problems than were those with under-confidence. Further mediation analyses revealed that the rating of the feasibility rather than the desirability of the task mediated the influence of state overconfidence on persistent behaviors. These findings provided future support for the self-justification hypothesis, and addressed arguments regarding the origins of overconfidence.

Keywords

peer-comparison overconfidence, feasibility, desirability, feedback

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Introduction

Overconfidence is a robust phenomenon seen in extensive areas of daily life among the general population. Although it is easily accepted that overconfidence is disadvantageous and even harmful, leading to diagnostic errors in medical treatment (Berner & Graber, 2008), low interpersonal credibility (Schultze & Stabell, 2004), and even the pursuit of unreasonable goals (Kahneman & Lovallo, 1993), some researchers stress the mental advantages of overconfidence, including increased motivation, higher goals, strengthened coping mechanisms in the face of negative feedback (e.g., Taylor & Brown, 1988; Bortolotti & Antrobus, 2015), increased competitiveness (Johnson & Fowler, 2011) and enhanced status in an organization (Kennedy, Anderson, & Moore, 2013; Anderson, Brion, Moore, & Kennedy, 2012). Similar constructs (e.g., self-efficacy) are negatively related to subsequent performance (e.g., Vancouver & Kendall, 2006; Schmidt & Deshon, 2009), so scholars emphasize the positive effect of overconfidence on performance.

It is reasonable to expect that overconfidence should play a positive role in the behaviors expected based on an individual's cognitive status (Herz, Schunk, & Zehnder, 2014). However, few previous researches explored the effect and mechanism of overconfidence from this perspective. It is of practical significance to study the effect of overconfidence on individuals' behavior from a positive psychology perspective. However, previous researchers have employed cross-sectional designs and studied the effect of overconfidence as a stable trait characteristic on general behavioral outcomes (e.g., Mertins & Hoffeld, 2015; Tekçe, & Yılmaz, 2015; Hribar, & Yang, 2015), that is, the tendency of each individual to express overconfident judgment tends to be stable over time and over tasks (Klayman, Soll, Gonzalez-Vallejo, & Barlas, 1999). For example, Mertins et al. (2015) designed a public goods game to examine the relationship between trait overconfidence and voluntary cooperation in team production and found that overconfident men were significantly more cooperative than those who lacked confidence. Tekçe et al. (2015) investigated overconfidence among individual stock investors and found that trait overconfidence was common among individual stock investors and had a negative effect on portfolio wealth. It is difficult to obtain direct evidence of the causal effects of overconfidence on individuals' behavior using cross-sectional designs. An experimental method can induce state overconfidence in an empirical study. Drawing on previous literature, the present study used an experimental situation to induce participants' state overconfidence, and on this basis to explore the influences of overconfidence on persistent behavior, which has been emphasized as a crucial ingredient in success and has been associated with performance benefits across a variety of situations (Scheier & Carver, 1993). In addition, the present study also explored the possible mechanisms through examining the mediation effects of feasibility and desirability in the relationship between state overconfidence and persistent behavior.

Overconfidence and Measures

The literature shows that people often overestimate their own ability, performance, control, or chances of success (Marottoli & Richardson, 1998; Kruger & Dunning, 1999; Mamassian, 2008; Johnson & Fowler, 2011; Anderson, Brion, Moore, & Kennedy, 2012). Overconfidence also occurs when people believe themselves to be better than others, such as when a majority of people rate themselves better than the median (Moore & Healy, 2008). Individuals' behaviors performances in many areas of daily life may be biased by overconfidence (Wright, 2000). Therefore, measuring overconfidence effectively is very important for exploring the effects of overconfidence.

There are many methods to measure overconfidence, as shown in previous studies. A commonly employed approach is peer comparison (Lee, Yates, Shinotsuka, Singh, Onglatco, Yen et al., 1995; Li, Chen, & Yu, 2006; Li, Li, Chen, Bai, Ren, Zheng et al., 2010; Yates, 2010), in which the participant is typically asked to make a percentile evaluation of his relative place in a group that has the same characteristics as the participant, i.e., a random sample of 100 people. According to Lee et al. (1995), if the participants are neither over- nor under-confident, their average estimates relative to their peers should be in the 50th percentile. Group-wide over- or under-confidence is measured as the difference between the average participant's estimate of her percentile rank and 50%:

$$\begin{aligned} &\text{Mean Bias (overconfidence or underconfidence)} \\ &= \text{Mean Percentile Estimated} - 50\%. \end{aligned}$$

Many previous studies have indicated that peer comparison questions are also valid for measuring bias in self-evaluation (Larrick, Burson, & Soll, 2007; Bi, Du, & Li, 2013). In these studies, participants with higher peer comparison overconfidence tended to overestimate their performance on a subsequent task to a greater extent than did those with lower peer comparison overconfidence.

Overconfidence and Persistence

Persistence refers to the act of continuing toward a task (Martinez, 2003). In previous literature, a persistence situation is a classical paradigm in which a person should confront a very difficult or unsolvable task and is unrestricted in either the time or the number of attempts (Feather, 1962). Persistence is measured by the total time or number of trials before turning to an alternative activity (Feather, 1962; Andrews & Debus, 1978; Lench & Levine, 2008; Greitemeyer, 2009).

Overconfidence is expected to be a predictor of persistence and should have a significant effect on persistent behaviors. Research has repeatedly demonstrated

that a strong sense of personal control is associated with higher motivation and greater effort to succeed (Dweck & Licht, 1980; Brunstein & Olbrich, 1985). The positive illusion of control, though not an accurate cognition about one's own ability, increases effort exerted to obtain a goal, especially when there are difficulties (Judge, Erez, & Bono, 1998; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). Taylor and Brown (1988) concluded that positive expectations help individuals to persist toward their goals. Research has also demonstrated that both the strong sense of control and undue optimism about the future are the most obvious features of an overconfident individual (McGraw, Mellers, & Ritov, 2004). On the basis of the above evidence, overconfidence, as a positive bias, should be a significant predictor of persistence.

Hypothesis 1. Overconfidence will have a significant positive effect on persistence.

Possible Roles of Feasibility and Desirability

There are other factors that can influence the relationship between overconfidence and persistent behavior, including feasibility and desirability (e.g., Brandstätter & Frank, 2002). Desirability refers to the incentive provided by the activity itself (Deci & Ryan, 1985), as well as those pertaining to the attainment of the goal (Heckhausen & Heckhausen, 2008). A desirable task or result could encourage individuals to feel that there is a higher possibility to achieve a goal and hence increase persistence. Some studies have demonstrated that overconfidence in predictions is related to the desirability of the predicted event (e.g., Giardini, Coricelli, Joffily, & Sirigu, 2008; Ecken, Gnatzy, & Heiko, 2011). Specifically, Giardini et al. (2008) examined the relationship between people's confidence in perceptual task and the desirable outcome through changing the reward of the perceptual task. The results indicated that people's overconfidence was closely related to the desirable outcome (the occurrence of events with high rewards) of perceptual task. In addition, Ecken et al. (2011) also discovered that participants' overconfident judgment on the probability of occurrence for future events was associated with the high desirability of future events. Therefore, high desirability of an event should be associated with overconfidence; together, these may affect persistence on subsequent tasks.

Feasibility is another factor that should affect the relationship between overconfidence and persistence. Feasibility refers to the ease or difficulty of reaching a goal (Liberman & Trope, 1998). A positive correlation (.41) between feasibility and persistence has been reported (e.g., Brandstätter & Frank, 2002). Polivy and Herman (2002) have summarized the distinguishing features of the overconfident person and believed that overconfident individuals usually fail to recognize non-competence and are inclined to ignore, to rebut, and to distort the evidence that

a task may be beyond their capacity. Those characteristics lead overconfident individuals to assert confidently they can do things beyond their ability. Therefore, overconfidence should have an effect on individual's persistence through misjudgment of the feasibility of a task.

Hypothesis 2. Overconfidence (but not under-confidence) should significantly predict the evaluated feasibility and desirability of a task.

Hypothesis 3. The influence of levels of confidence (i.e., overconfidence and under-confidence) on persistent behavior will be mediated by the evaluation of feasibility and desirability of a task.

Taking undergraduate students as participants, state overconfidence and under-confidence were induced by providing positive and negative bogus feedback, respectively, of the task performance. On this basis, the effect of state overconfidence on persistence and the possible mediation effects of the feasibility and desirability on relationship between state overconfidence and persistence were explored.

Method

Participants

Sixty-three undergraduate students (37 women, 26 men; M age = 20.9 yr., $SD = 1.8$) participated in the experiment and were paid ¥10 after completing the experiment. There were two locations on campus for recruitment of participants, one was at the exit of a library and the other one was at the exit of a dining hall. According to the advertisement in which the students were told that there would be an experiment to test their ability in numerical reasoning and they would be paid ¥10, students raised some questions about the experiment and after given explanations by the researcher, they were then asked whether they would like to participate in the experiment. All participants were randomly assigned to a negative ($n = 32$) or positive feedback group ($n = 31$). Due to sudden loss of power to the computer, two female participants in the positive feedback group were influenced when they were doing the numerical reasoning task, and their data were not included in the dataset for final analysis. The mean age of remaining participants was 20.9 yr. ($SD = 1.9$).

Measures

Overconfidence. A commonly employed approach to assess overconfidence is the peer comparison question (Lee et al., 1995; Li et al., 2006; Li et al., 2010; Yates,

2010). According to Lee et al. (1995), eight peer comparison items were designed for this experimental situation to measure overconfidence. A sample item is as follows:

*Imagine a random sample of 100 college students the same sex as you, who entered the university the same year you did.—Assume that you are one of those 100 students. Suppose that all 100 students in the sample are ranked according to **numerical reasoning skills**. What is your best estimate of the number of students in the sample (0–99) who would receive a higher score than you do? : _____*

The other seven peer comparison items were similar with the sample item, and replaced the phase “numerical reasoning skills” by “logic analysis capability”, “abstraction capability”, “reverse reasoning skills”, “computing capability”, “reasoning skills”, “comprehensive capability of the quantitative relationship” or “performance of numerical reasoning”.

Peer-comparison overconfidence was calculated using the following formula of Lee et al. (1995), Mean bias = Mean percentile estimated – 50%. Internal consistency reliability coefficients α and ω for the eight peer comparison questions were .95 and .94, respectively, in this sample.

Feasibility. According to Brandstätter and Frank (2002), three items, “How difficult do you think it is to solve the numerical reasoning task,” “How close do you feel to solving the numerical reasoning task,” and “How likely is it that you will solve the numerical reasoning task” were used to assess the participants’ estimate of the feasibility of the task on 13-point scales ranging from 1 (*not at all*) to 13 (*very*). A composite score of the three items was used. After recoding the first item, Cronbach’s α coefficient of the three items was .72 and ω was .76 in the present sample.

Desirability. According to Brandstätter and Frank’s (2002) recommended method, four items including “How important is it for you to solve the numerical reasoning task,” “How much do you enjoy solving the numerical reasoning task,” “How interesting is the numerical reasoning task,” and “How relaxing is it for you to solve the numerical reasoning task” were used to assess participants’ desirability toward the task on the 13-point scales ranging from 1 (*not at all*) to 13 (*very*). In the present sample, the Cronbach’s α coefficient of the four items was .62 and ω coefficient was .72.

In order to validate the items of feasibility and desirability, a panel study was conducted with five experts in psychology assessing the validity of these items. The seven items of feasibility and desirability were mixed, and then the panel members were provided with the description (definition) of feasibility (and desirability) and were asked to make judgments among the seven expressions about which items best fit the operational definition of feasibility (and desirability). Panel members were required to sort these items that they believed to represent feasibility best or desirability best. All the items were correctly sorted by the

experts, which indicated that those items have adequate content validity and discriminant validity.

An exploratory factor analysis was also conducted to examine the factor structure of feasibility and desirability items. The exploratory factor analysis involved a principal component analysis followed by varimax rotation. As expected, three feasibility items and four desirability items separately constituted two factors accounting for 65.7% of the various.

Persistence. The classical persistence paradigm was employed to test persistence. Participants were required to solve a series unsolvable numerical reasoning task. According to the persistence-related literature (Andrews & Debus, 1978; Lench & Levine, 2008; Greitemeyer, 2009), the time that the participant spent on the numerical reasoning task, as well as the total amount of time spent on the first item before advancing to the second item, were recorded in the process of working the experimental task and taken as the indicators of persistent behaviors. For more detailed information, please refer to the following Procedure section.

Procedure

After arriving at the laboratory, participants were led to a separate room so that their behavior was not affected by the behavior of other participants (for example, if one participant decided to quit the experiment and left the lab, other participants who saw this might hurry to finish). Participants were told that the purpose of the study was to examine numerical reasoning ability. After participants provided their demographic data including their sex, grade, and age, they were allowed 1 min. to familiarize themselves with an example of the numerical reasoning task. [i.e., select a correct number to complete the reasoning question of “3, 2, 3, 7, 18, ().” The choices for this item are “A.47, B.24, C.36, D.70.”]

The following task was conducted using a computer. In order to test whether the negative feedback group and positive feedback groups were randomly assigned, participants were first required to rate their numerical reasoning ability using an 11-point scale with anchors 0%: “My numerical reasoning ability was worse than all others” and 100%: “My numerical reasoning ability was better than all others” by increments of 10% before the feedback was given. If there was no difference in the mean ability rating between the two groups, it can be considered that the two groups were equal before receiving feedback and the grouping procedure was random.

Next was the feedback manipulation. Participants were required to complete 10 multiple-choice questions about numerical reasoning in 5 min., presented one by one, which are similar to the sample item mentioned above. They were told that, “after the 10 items are finished, the system will evaluate your ability to solve numerical reasoning questions. The evaluation will be based on the

correctness and the time you spent on the 10 problems. High correctness scores with a short completion time represent high ability.” When all 10 multiple-choice items were completed, participants were randomly given negative or positive feedback about their ability to solve numerical reasoning questions. In the positive feedback condition, participants were told that “Great! Judging by your correctness and completion time, your numerical reasoning ability is at the 75th percentile, which means that 75% of the students taking the test scored lower than you. It is a relatively high level of ability.” In contrast, participants in the negative condition were told “Sorry! Judging by your correctness and completion time, your numerical reasoning ability is at the 25th percentile, which means that your score on the task is only better than 25% of the students taking the test. It is a relatively low level of ability.” According to the method used by Arkes, Christensen, Lai, and Blumer (1987), this type of manipulation can successfully induce the states of overconfidence or under-confidence, respectively.

After a brief explanation of the feedback results, participants were required to fill out the eight items measuring overconfidence (see peer-comparison items in the Measures section). Subsequently, participants were asked to rate the feasibility and desirability of solving numerical reasoning questions (see feasibility and desirability items in the Measures section). In order to test the effectiveness of the manipulation of different types of feedback, participants were then asked to rate their ability to solve the numerical reasoning task again on a 7-point scale ranging from 1 (*very weak*) to 7 (*very strong*).

Then the persistence of participants was measured. A computer program presented one numerical reasoning item at a time. Each item was followed by three choices including “I have done the numerical reasoning item and I want to switch to the next item,” “I want to give up this item and try the next item,” and “I want to quit this task.” It was emphasized that it was entirely up to the participants when to cease doing the numerical tasks. The time that the participants spent on the numerical reasoning task, as well as the total amount of time spent on the first item before advancing to the second item, were recorded as the persistence measure. The end of the task was determined either by the participants or by the experimenter if the participant’s persistence exceeded a predefined maximum of 60 min. or if the participants attempted all 20 items. Every item was unsolvable. Although participants attempted all 20 items or their persistence exceeded a predefined maximum of 60 min., they were not dropped from the analysis because their data were complete.

When the experiment was finished, participants were asked to state the purpose of the experiment before they left the experimental lab. None of the participants expressed any awareness of the true purpose of the experiment. Finally, participants were told the purpose of the experiment and were given contact information for turning for help if any discomfort was felt because of the experimental manipulation.

Table 1. Means and Standard Deviations of Variables as a Function of Condition.

Variable	Positive Feedback		Negative Feedback		<i>t</i> (59)	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Self-estimated ability before feedback, %	53.10	0.15	50.63	0.19	0.57	0.14
Self-estimated ability after feedback	4.34	1.08	2.69	0.90	6.55†	1.66
Peer-comparison overconfidence, %	10.48	0.14	-11.08	0.15	5.61†	1.46
Feasibility	3.49	0.83	2.85	1.28	2.29*	0.60
Desirability	4.45	1.14	4.06	1.20	1.32	0.34
Total working time, min.	40.01	15.02	27.35	15.02	3.30†	0.86
Time spent on the first item, min.	5.90	4.44	4.00	2.73	2.05*	0.53

* $p < .05$. † $p < .01$.

Results

Apart from the participants who chose to quit the numerical reasoning task, eight participants (six in the positive feedback group and two in the negative feedback group) who persisted for 60 min., and seven participants (three in the positive feedback group and four in the negative feedback group) who attempted all 20 items asked to quit the task.

The Effectiveness of the Feedback Manipulation

As expected, before feedback, self-estimated ability to solve numerical reasoning problems did not differ between participants assigned to the positive feedback group and those assigned to the negative feedback group (Table 1; $t = 0.57$, $p < .05$, Cohen's $d = 0.14$). After feedback, participants in the positive feedback group rated themselves as more competent in numerical reasoning than did those in the negative feedback group ($t = 6.55$, $p < .01$, Cohen's $d = 1.66$). These results indicated the participants were randomly grouped and they correctly perceived the feedback.

The data were combined across the eight peer comparison questions and the mean peer comparison overconfidence was calculated. Further analysis indicated that the overconfidence of the participants in the positive feedback group was higher than that of the participants in the negative feedback group ($t = 5.61$, $p < .01$, Cohen's $d = 1.46$), indicating that the feedback procedure to manipulate overconfidence was valid.

Task Persistence

There was significant difference of persistence on the numerical reasoning task between the two groups. Participants in the positive feedback group spent more time on the task than the negative feedback group ($t=3.30$, $p<.01$, Cohen's $d=0.86$), and more time on the first item ($t=2.05$, $p<.05$, Cohen's $d=0.53$).

In order to test Hypothesis 1, regression analyses with persistence as the dependent variable were conducted. The results showed that peer comparison overconfidence was a significant predictor of total working time on the numerical reasoning task (adj $R^2=.24$, $\Delta R^2=.26$, $\beta=0.51$, $p<.001$) and time spent on the first item ($R^2_{\text{adj}}=.08$, $\Delta R^2=.10$, $\beta=0.31$, $p<.05$), which supported Hypothesis 1.

Feasibility and Desirability

There was significant difference on mean feasibility ratings for the numerical reasoning task between the two groups. Participants in positive group rated solving the numerical reasoning items as more feasible than the negative feedback group ($t=2.29$, $p<.05$, Cohen's $d=0.60$). However, participants in positive feedback group did not rate solving the numerical reasoning items as more desirable ($t=1.32$, $p<.05$, Cohen's $d=0.34$).

In order to test Hypothesis 2, regression analyses were conducted with overconfidence (or under-confidence) predicting both feasibility and desirability. For the positive feedback group, the results indicated that the rating of feasibility (adj $R^2=.29$, $\Delta R^2=.31$, $\beta=0.56$, $p<.01$) and desirability (adj $R^2=.15$, $\Delta R^2=.18$, $\beta=0.42$, $p<.05$) could be predicted by overconfidence separately. For the negative feedback group, neither feasibility (adj $R^2=.00$, $\Delta R^2=.03$, $\beta=0.17$, $p>.10$) nor desirability (adj $R^2=.03$, $\Delta R^2=.00$, $\beta=-0.01$, $p>.10$) could be predicted by under confidence. Taken together, those results supported Hypothesis 2.

Mediation Analysis

To examine whether the relation between overconfidence and persistence was mediated by participants' rating of feasibility and desirability, Preacher and Hayes' (2008) bootstrapping procedure was employed. The analysis used 5,000 resamples with replacement to derive a 95% confidence bias-corrected confidence interval for the indirect effect of overconfidence on persistence as transmitted via feasibility and desirability. This analysis revealed that when persistence was defined as time spent on task, the confidence intervals of indirect effect of feasibility and desirability on persistence ranged from 0.73 to 29.43 and from -0.34 to 16.37, respectively. Results of the mediation analysis with time spent on the first item were very similar (the confidence intervals for feasibility

ranged from 0.11 to 5.51 while for desirability ranged from -0.51 to 3.11). Because the confidence intervals for feasibility exclude zero, this indicated a significant mediation effect of feasibility on persistence. The confidence intervals for desirability included zero, showing the non-significant mediation effect of desirability on persistence. In sum, these results indicated that the mediation effects of feasibility on overconfidence and persistence were significant, while the mediation effects of desirability on overconfidence and persistence were not significant. These results partly supported Hypothesis 3.

Discussion

The present results suggested that state overconfidence is related to persistence of on-task effort. Results also indicated a positive relationship between the rating of task feasibility and persistent behavior. Analyses revealed that the effect of state overconfidence on persistent behavior was mediated by rating of task feasibility. Though the correlation between the rating of task desirability and persistence was also positive, no mediation effect of desirability on the relationship between peer comparison overconfidence and persistent behavior was found. Greitemeyer, Lebek, Frey, and Traut-Mattausch (2011) found that people actively try to change situations even when it is doubtful that the situation is amenable to change, which explains why overconfidence is related to feasibility ratings. In sum, participants spent more time on the task because they predicted that completing the task was feasible, not because they were attracted by the task.

These results shed light on the importance of maintaining positive self-assessment in the context of school learning. Though being persistent is not beneficial in all situations, especially when tasks are impossible (Polivy & Herman, 2002), persistence is clearly important in the context of learning in school, in which didactic problems, though they may be very difficult sometimes, are basically solvable. Greitemeyer (2009) has argued that if obstacles that hamper the attainment of a goal can be overcome, then simple abandonment of the goal is a poor strategy to follow. Although the present results do not imply that multiple attempts guarantee success, it may be the case that eventual success requires multiple attempts in some difficult but attainable situations. According to the present results, a positive self-assessment fosters persistence. Taken together, the evidence indicates the importance of maintaining a positive self-assessment in the context of learning in school. In addition, the results also showed that positive feedback helped participants to maintain a positive self-assessment.

According to the self-justification hypothesis, a decision maker enlarges the commitment of resources in the face of negative consequence to justify prior behavior (Staw, 1976). The present study provides a new perspective by discussing the importance of justifying one's ability in persistence behavior, and the data

in fact showed that there were positive correlations between self-rated competence and total working time.

Persistence in the face of obstacles is generally seen as a virtue (Janoff-Bulman & Brickman, 1982), and the findings speak to arguments regarding the origins of overconfidence. As a decision bias, overconfidence has often been blamed for high-profile disasters including diagnostic errors in medicine (Berner & Graber, 2008) or even wars (Johnson, McDermott, Barrett, Cowden, Wrangham, McIntyre et al., 2006); it is unclear why overconfidence occurs or how it could remain so pervasive in spite of a host of competing accurate beliefs. The present findings add new evidence to the literature that people are overconfident because of the benefits it provides.

Though the present research did not investigate whether performance was fostered by overconfidence, the existing results in the literature and the findings may shed light on these correlations. Some researchers have documented that people who maintained a positive self-assessment reached a better performance level (e.g., Judge et al., 1998). The present findings further suggested that there could be positive effects of overconfidence on persistent behavior. A future study could investigate whether the beneficial effects of overconfidence on persistence increase performance on solvable tasks.

Limitations and Future Directions

Several potential limitations of this study should be noted. First, overconfidence measured in the present study is just temporary overconfidence induced by feedback, without considering participants' initial level of overconfidence or real numerical reasoning ability. Thus, future studies measuring the general overconfidence on extensive behavioral outcomes may shed light on the role of feasibility and desirability in mediating the effect of overconfidence and task persistence. Second, the sampling technique recruiting participants by asking whether they would like to participate in an experiment may be a threat to external validity (Campbell, Stanley, & Gage, 1963). Future studies should employ the more general strategies to recruit participants. Third, percentile feedback information was used to induce participants' state overconfidence, but the influence of percentile information on participants' evaluation could not be excluded. A worthwhile avenue in future researches would be to use more general feedback, such as "Great!" and avoiding numerical feedback, which would make the self-report ability more accurate.

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