Automatic ability attribution after failure: a dual process view of achievement attribution


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Automatic Ability Attribution after Failure: A Dual Process View of Achievement Attribution

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Abstract

Causal attribution has been one of the most influential frameworks in the literature of achievement motivation, but previous studies considered achievement attribution as relatively deliberate and effortful processes. In the current study, we tested the hypothesis that people automatically attribute their achievement failure to their ability, but reduce the ability attribution in a controlled manner. To address this hypothesis, we measured participants’ causal attribution belief for their task failure either under the cognitive load (load condition) or with full attention (no-load condition). Across two studies, participants attributed task performance to their ability more in the load than in the no-load condition. The increased ability attribution under cognitive load further affected intrinsic motivation. These results indicate that cognitive resources available after feedback play crucial roles in determining causal attribution belief, as well as achievement motivations.

Introduction

Causal attribution has been one of the most influential frameworks for understanding how individuals perceive and interpret their own behaviors as well as other’s behaviors. In the realm of achievement motivation, since Weiner and Kukla’s influential work [1], a vast amount of research has addressed motivational and emotional consequences of perceived causes (e.g., ability, task difficulty) in achievement contexts [2–4]. Researchers have also revealed various factors influencing causal attribution of one’s achievement performance (for reviews see [5–6]). Despite the extensive previous research, however, past studies have been relatively mute on the underlying process of causal attribution in achievement settings. In the current study, drawing on the dual process models of social cognition [7], we examine how people’s causal attribution of their performance is associated with automatic- and controlled-processes.

Ability is one of the primary concerns of people in achievement settings [8]. People are motivated to seek ability information [9] and are chronically concerned with how their ability is evaluated [10]. One’s belief about ability also alters achievement behaviors [11–12] and reactions to performance feedback [13]. Furthermore, threats on people’s ability impair performance in a wide variety of tasks [14]. Because of the strong saliency of ability, it seems to be the most straightforward factor in which one attributes his/her failure when faced with achievement feedback [15].

However, attributing task failure to one’s ability can lead to maladaptive outcomes. Ability is an internal and stable causal factor that people cannot control; thus ability attribution following task failure tends to augment one’s expectation for future failures, demotivating people from the task [4]. Indeed, ability attributions for failure are known to lower motivation and self-esteem, and increase depressive symptoms as well as negative affects [3,16]. Importantly, past studies indicated that people are aware of those maladaptive consequences of ability attribution [17–18]. This suggests the possibility that people have an inclination to reduce ability attributions when facing failure outcomes.

In the current study, we hypothesized that people automatically attribute their task performance to their ability, but reduce ability attribution in a controlled manner. We addressed separate contributions of automatic and controlled processes by manipulating participants’ cognitive resources [19]. During the study, we measured participants’ causal attribution of their failure while manipulating their cognitive resources; Half of participants were told to infer causal reasons under cognitive load (load condition), whereas the other made an attribution with full attention (no-load condition). If ability attribution occurs automatically and is reduced in a controlled manner, ability attribution should be enhanced in the load than in the no-load condition. Study 1 provided the evidence for this hypothesis. Study 2 replicated the automatic ability attribution even when ability was not a plausible cause for failure. Study 2 also documented motivational consequences of ability attribution by assessing participants’ motivation about achievement tasks.

Study 1

Method

Thirty-three Japanese undergraduates (Mage = 20.38; 15 males) were randomly assigned to the load or no-load condition. The experimental protocol (both Studies 1 and 2) conformed to the ethics guidelines of the Japanese Psychological Association. The
study was approved by the ethics committee of the Graduate
School of Education at the University of Tokyo and participants
provided their written consent. All data were analyzed
anonymously; data files are available on request.

Participants were given a modified version of the Raven’s
progressive matrices task for 10 min. The task consisted of 10
difficult items; no one could solve all of the items. Immediately
after the task, a computer provided bogus success feedback: “Your
score is 28 (the average score from undergrads in your university is
54).” All participants then answered a manipulation check
question (“How well did you perform on the reasoning test?”) on
a 4-point scale (1: failed, 2: relatively failed, 3: relatively
succeeded, 4: succeeded). Both in Studies 1 and 2, most
participants reported in the manipulation check question that
they failed or relatively failed at the task (Study 1: \(M = 1.67,\)
\(SD = 0.69\); Study 2: \(M = 1.67, SD = 0.48\); but two participants in
Study 1 and four participants in Study 2 reported that they
succeeded or relatively succeeded on the task. Because the causal
reasoning questionnaire was designed only for failure situations,
we did not conduct the causal reasoning questionnaire to these
participants; therefore, they were not included in the reported
analyses.

Participants were then given a causal reasoning questionnaire
[20–21] and rated the extent to which each item caused their
failure on a 5-point scale. The questionnaire included four items
on ability attribution (e.g., “because of the lack of my reasoning
ability,” “because I’m not smart”; reliability = .87) and four items
on task attribution (e.g., “because the task was difficult,” “because
the test was too advanced”; reliability = .84).

Participants in the no-load condition answered the attribution
questionnaire without any additional tasks. In contrast, partici-
pants in the load condition answered the questionnaires while
working on a sound-pitch judgment task obtained from previous
research [19]. In the sound judgment task, participants listened to
a sound sequence which consisted of a low-, a medium-, and a
high-pitched tone in randomized order with variable intervals
(approx 1–3 secs). The participants’ task was to keep track of the
sound sequence and press a button immediately after detecting a
sequence of low-, medium-, and high-pitched tones in that order.
Participants were familiarized with this dual task procedure using a
different questionnaire at the beginning of the study.

Results

Generalized Eta Squared (\(\eta^2_g\)) was used to estimate effect sizes
[22]. One participant was identified as an outlier and excluded
from the analysis (i.e., Tukey’s criterion of three times the
interquartile range higher than the third quartile. Grubbs’ test for
outliers was significant [23]). As shown in Figure 1, task load
manipulation selectively enhanced ability attribution. A 2 (cause:
task, ability) X 2 (attention) mixed ANOVA with cause as a
repeated measures factor on the attribution scores revealed a
significant cause x attention interaction, \(F(1, 28) = 4.86, \eta^2_g = .05,\)
\(p < .05\). Participants reported higher ability attribution in the load
than in the no-load condition (Figure 1), \(F(1, 28) = 4.65, p < .05,\)
while the task attribution score did not differ across the conditions
\(p > .78\).

Study 2

Study 2 sought to extend Study 1 in two ways. First, we
examined whether our findings can be replicated even when
ability was not a plausible cause for failure. Specifically,
participants were explicitly instructed that the task was unusually
difficult when they are provided failure feedback. Thus, partici-
pants did not have any plausible reasons to believe that the failure
was caused by their lack of ability, which should allow for a
stronger test for the automaticity of ability attribution. Second,
Study 2 assessed intrinsic motivation after the task to address
motivational consequences of ability attribution. Given that ability
attribute after failure is associated with maladaptive outcomes,
we expect that increased ability attribution under cognitive
load should reduce intrinsic motivations toward a task. In other
words, we hypothesized that ability attribution serves as a
mediator between cognitive load manipulation and intrinsic
motivation.

Method

Twenty-eight Japanese undergraduates (\(M_{age} = 19.8; 20\ males\)
were randomly assigned to the load or no-load condition. The
procedure was identical to Study 1, with two exceptions. First, the
feedback included only participants’ raw score without the average
score of other students (i.e., “Your score is 28”), and participants
were explicitly told that the task was designed to be extremely
difficult for all students. Second, along with the causal attribution
measurement (reliability: ability = .97, task = .86), participants
answered five items on intrinsic motivation to the reasoning task
with a 5-point scale (reliability = .92; e.g., “I found the task
interesting” [24]).

Results

As indicated in Figure 2, task load manipulation again
selectively enhanced ability attribution. A 2 (cause) X 2 (attention)
ANOVA with cause as a repeated measures factor on the
attrition scores revealed a main effect of cause, \(F(1, 22) = 4.85, \eta^2_g = .07, p < .05,\)
and a significant cause and attention interaction (Figure 2), \(F(1, 22) = 4.85, \eta^2_g = .07, p < .05.\) Consistent with Study 1, participants reported higher ability attribution in the
load than in the no-load condition, \(F(1, 22) = 8.09, p < .01,\) but the
task attribution score did not differ across the conditions \(p > .80\).

Additional analysis (Figure 3A) showed that participants showed
decreased intrinsic motivation in the load than in the no-load
condition, \(F(1, 22) = 6.04, \eta^2_g = .22, p < .05.\) To address whether
the reduced motivation in the load condition is due to their

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**Figure 1.** Ability and task attribution made under full and
divided attention condition after participants received failure
feedback (Study 1). Ability attribution score was higher in the load
condition than in the no-load condition, while task attribution score
did not differ across attention manipulation. Error bars represent
standard errors.
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The analysis revealed upper (−0.056) and lower (−0.903) limits that did not include 0. These results indicate that ability attribution was a statistically significant mediator of the relationship between the load manipulation and motivation (Figure 3B).

General Discussion

Overall, the findings support our hypothesis that people automatically attribute their task performance to ability but reduce ability attribution in a controlled manner. Specifically, our experiments showed that participants attributed their task failure to ability more when cognitive resources were depleted than when they had sufficient cognitive resources. These patterns were observed even when ability is not a plausible cause of failure – participants’ awareness of other possible causal factors did not alter this increased ability attribution under cognitive load. Furthermore, our analysis indicated that the increased ability attribution due to cognitive depletion is related to impaired intrinsic motivation. Attribution literature on achievement motivation has considered attribution mainly as deliberate and effortful processes [4]. Our work, on the other hand, suggested the importance of considering the cognitive processes underlying causal attribution to achievement outcomes.

Our work has implications not only on the achievement motivation literature, but also on the literature on self-serving bias. Studies in self-serving bias have indicated that, when inferring causal reasons of one’s own behavior, people tend to attribute failure to external causes (e.g., task, teacher, mood) and success to internal causes (e.g., ability and effort; for reviews, see [26]). This is interpreted as the manifestation of self-enhancement motive [27]. However, most of the empirical studies in self-serving attributional bias collapsed different types of attributions together; they typically compute a single internal-external attribution score by subtracting external attributions (e.g., task, mood) from internal attributions (ability, effort) [26,28]. Our work, on the other hand, highlighted the importance of examining the unique role played by ability attribution. It is also important to note that some behavioral evidence suggested that self-enhancement tendency could manifest automatically [29–30]. However, these studies examined self-enhancement motive in the absence of self-relevant outcome feedback. There is a large body of literature indicating that negative outcome feedback is processed automatically and has a big impact on the self [31]. In such case, self-enhancement motive may serve as a motivator of controlled process to repair the rapidly decreased self-esteem [32–33]. Future work would do well to examine such multifaceted function of self-enhancement motive.

A potential limitation of our research is that we used self-reports to assess attribution and intrinsic motivation. Although this is a standard way of assessing attribution and intrinsic motivation in previous literature [34–35], the use of self-report measures has been critiqued, due to the susceptibility of self-report data to various response biases [36]. Future work is needed to validate our findings using behavioral measurements (e.g., task-engagement to assess intrinsic motivation [37]).

Previous studies have shown that people are aware of the maladaptive consequences of ability attribution after failure [18]. Given this observation, it is a mystery why people do not stop attributing their failure to ability. Our findings provide a clue to address this issue – people do know it is maladaptive, but cannot avoid it in the first place. We hope these findings not only provide...
a better understanding of human causal attributional process, but also bring practical implications on how to alter maladaptive attribution in achievement settings [30].

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Author Contributions
Conceived and designed the experiments: MS KM. Performed the experiments: MS KM. Analyzed the data: MS KM. Contributed reagents/materials/analysis tools: MS. Wrote the paper: MS KM.

References
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