The effect of delayed versus immediate feedback on perceptual learning

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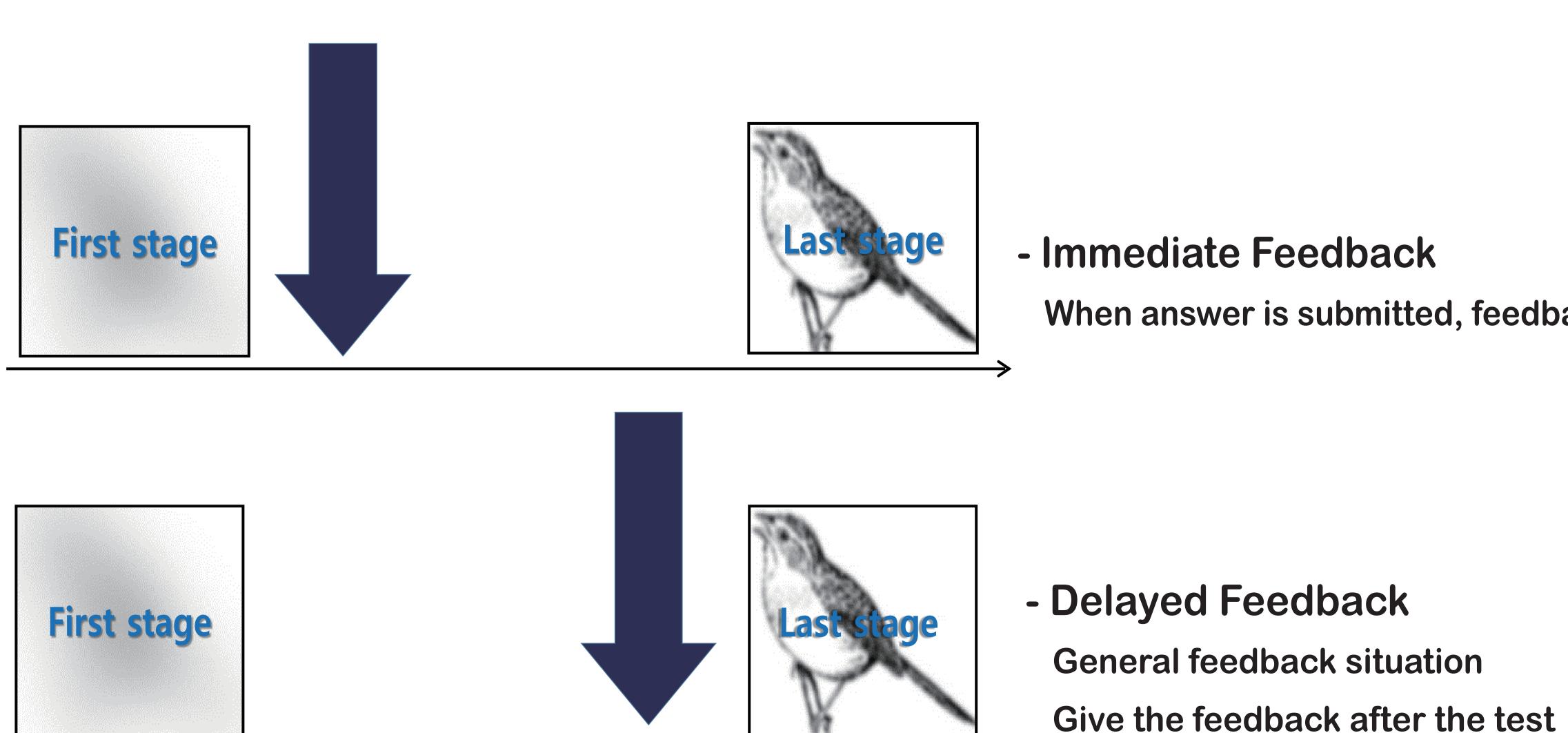**Ajou University**

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Abstract

This study examined the function of feedback presented during learning situations. The present study was designed to examine that timing of feedback have an influence on learning strategy and learner's performance. In addition, we purposed to observe that how learner to control their learning time. There were four conditions based on the timing of feedback(delayed feedback, immediate feedback) and autonomy(self-paced, forced) over learning time. Participants were asked to name the presented images as quickly as possible, which started faint and became successively clear. Results show that immediate feedback negatively affected task performance on short-term test because it makes participants feel like that they know the answer. but this effect have disappeared in long-term test. This implies the need to consider the timing of feedback, autonomy and learning situation over learning.

Introduction

- **Immediate feedback vs. Delayed feedback**
  - In behaviorism, feedback should be used to inhibit inaccurate responses and to enhance accurate response.
  - There are a lot of controversy about which timing of feedback is better in learning.
  - Providing immediate feedback can be some advantages or disadvantages in learning according to the kind of category. (Maddox, 2003)
  - A study that is conducted in the classroom supported immediate feedback, whereas the study in laboratory supported delayed feedback.(Metcalfe, 2009)

- **The allocation of study time**
  - People have tended to study the judged-difficult-to-learn materials longer than they studied the judged-easy-to-learn materials(Son & Kornel, 2008).
  - In the past researches, the aspects of JOL, EOL and FOK was discussed.
    -> The research has yet conducted the aspects of timing of feedback in allocation of study time.

-> We investigated the effect of feedback timing on learning and allocation of study time.
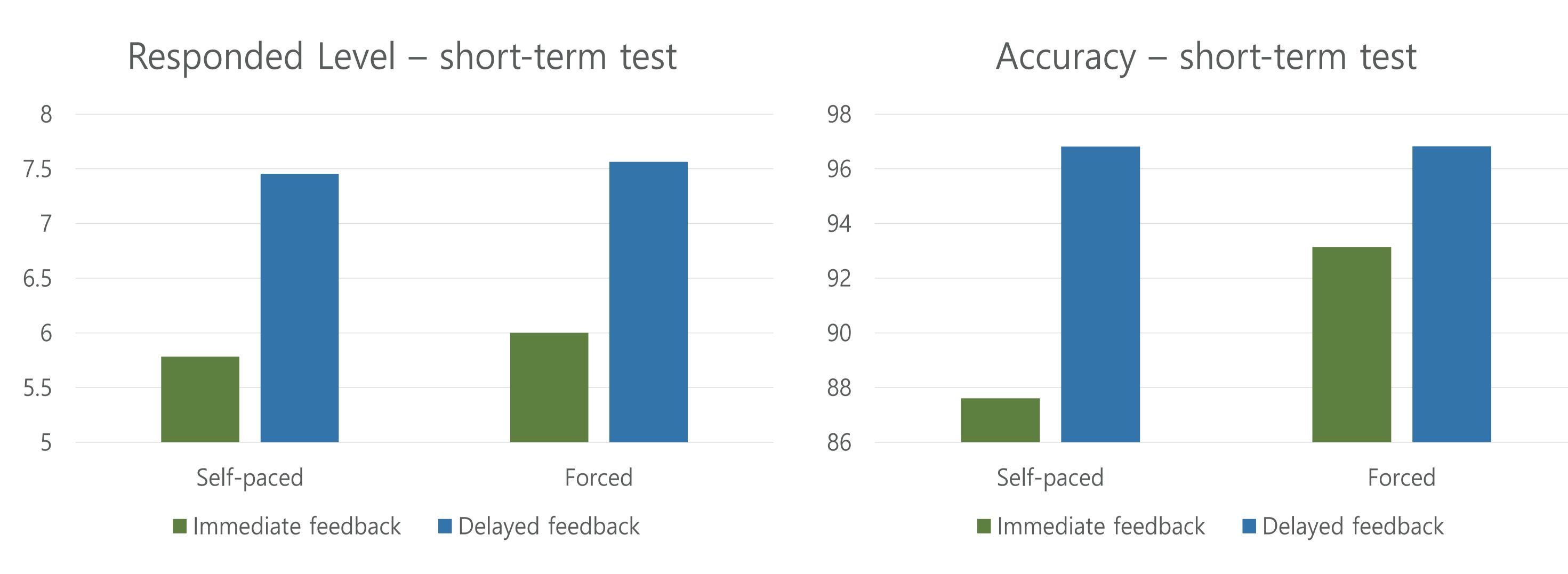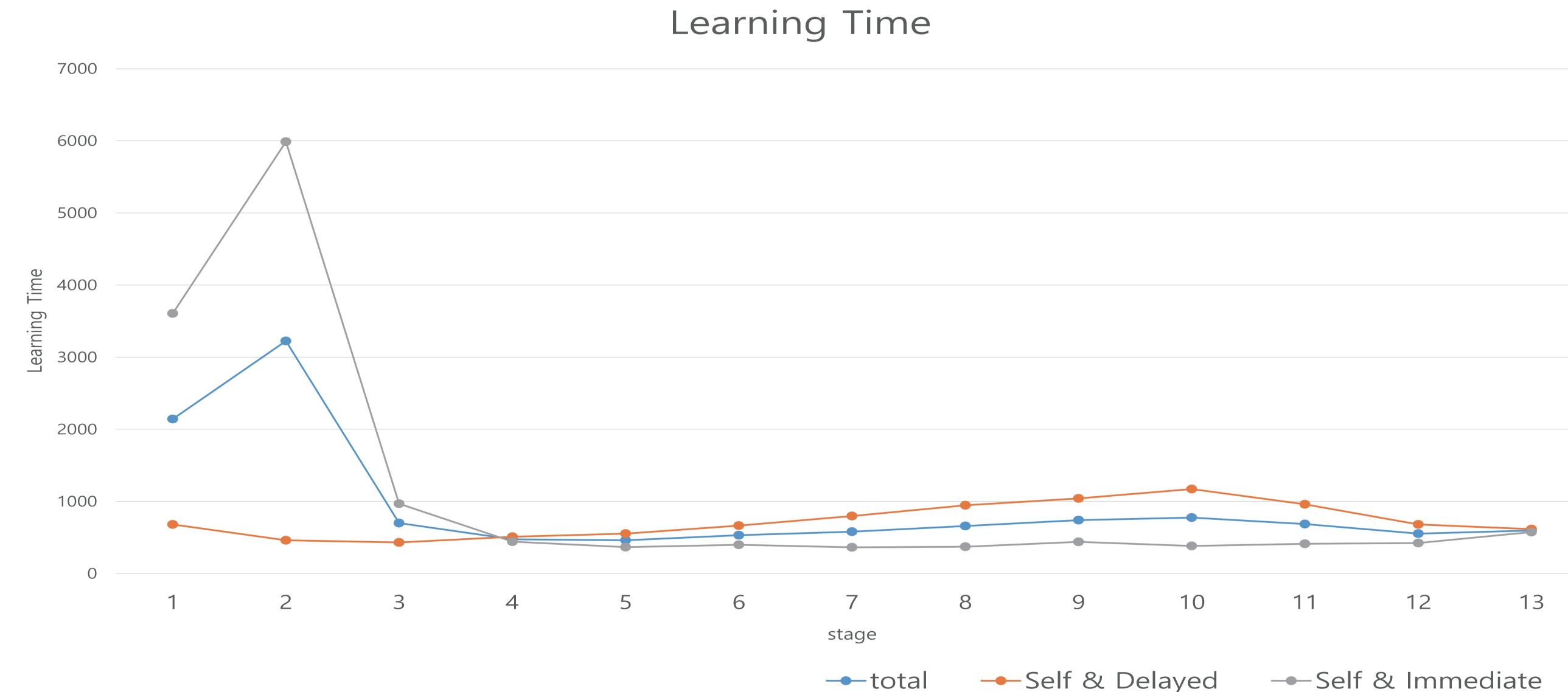-> We checked out the effect of feedback on both short-term and long-term perspectives.

First stage → Last stage

- **Immediate Feedback**
  When answer is submitted, feedback is provided instantly

First stage → Last stage

- **Delayed Feedback**
  General feedback situation
  Give the feedback after the test

Results

Responded Level – short-term test

Immediate feedback   Delayed feedback

Accuracy – short-term test

Immediate feedback   Delayed feedback

Learning Time

total   Self & Delayed   Self & Immediate

Experimental design & procedure

- Timing of feedback X Autonomy (2 X 2 between-subject design)
  1-a) Immediate feedback: Providing feedback at 3 level
  1-b) Delayed feedback: Providing feedback at 13 level
  2-a) Self-paced: Use learning time on their own.
  2-b) Forced: Learning time is limited as 1.5 sec. per stage.

1. Learning session
   Material: total 21 kinds of object. Visibility of Each picture is divided into 13 levels
      1 level- ambiguous picture(very hard to identify the object) /
      13 level- clear picture(easy to identify the object)
2. filler task : up-side-down task 50trials
3. short-term task : Object pictures were presented in the same way of learning session.
   Participants were asked to write an answer when they seemed to know what the object is.
4. long-term task: The experiment was conducted in the same way of short-term task after 2days.

Results

- Responded level
  - The main effect of timing of feedback in short-term test(F=26.983, p < .001)
    -> People who received immediate feedback quickly entered the answer than people who received delayed feedback. ($M_{immediate}$ = 5.892, $M_{delayed}$ = 7.510)
  - The main effect of timing of feedback in long-term test(F=14.202, p < .001)
    -> People who received immediate feedback quickly entered the answer than people who received delayed feedback. ($M_{immediate}$ = 5.988, $M_{delayed}$ = 7.056)

- Answer accuracy
  - The main effect of timing of feedback in short-term test(F=15.343, p < .001)
    -> answer accuracy of delayed feedback condition is more higher than immediate feedback condition. ($M_{immediate}$ = 90.37, $M_{delayed}$ = 96.82)
  - No difference in long-term test

- Learning time in self-paced condition
  - Learning time is significantly different between immediate feedback and delayed feedback ($M_{immediate}$ = 14730.340, $M_{delayed}$ = 9512.839, F=9.634, p<.005)

Discussion

- Immediate feedback conditions in short-term test: Participants typed the answer very quickly but their accuracy was relatively low
  -> From the beginning of the learning phase to the last stage, they has been given continuous feedback
  -> Because of overconfidence which caused by repeated exposure, they misunderstood that they could get the right answer
- Immediate feedback conditions in long-term test : Participants still typed the answer quickly but their accuracy is increased.
  -> From a long-term perspectives, Immediate feedback appears to get advantages in perceptual learning
- Those who received immediate feedback in self-paced conditions, they use more learning time to complete before receiving feedback until 2nd stage.
- After 3rd stage, participants who received delayed feedback use more time in learning sessions.
  -> Because the answer is provided continuously during the learning session, participants created the illusion that they know the answer very well.
  -> Overconfidence that caused by repeated exposure is occurred.
- To make sure that this results in more certain, we will change the immediate feedback appear only once on each picture.
- Furthermore, there is a need to see if there is any difference between the actual discrepancies in JOL.
  ->An additional experiment is being in process.

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