

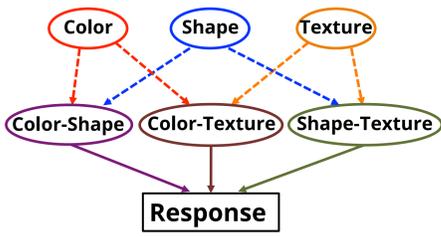
Transfer of Multi-Attribute Stimulus-Response Mappings

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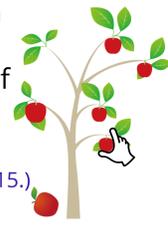
INTRODUCTION

In the human visual system, different attributes are processed separately. Then the attributes of an object are integrated to elicit a response.

Based on the **paired-attribute model** (Morita et al., 2010), Ishizaki et al. (2015) suggested that **bound feature pairs** are units of **multi-attribute stimulus-response association**.



Our previous study confirmed the **superiority of color-shape pair** in **learning** multi-attribute Stimulus-Response mapping; Learning the association of a color-shape pair with a response is easier than that of a color-location pair or a shape-location pair. However, there is no significant difference in performance of these mappings after completion of learning the association. (We presented these results at APCV 2015.)



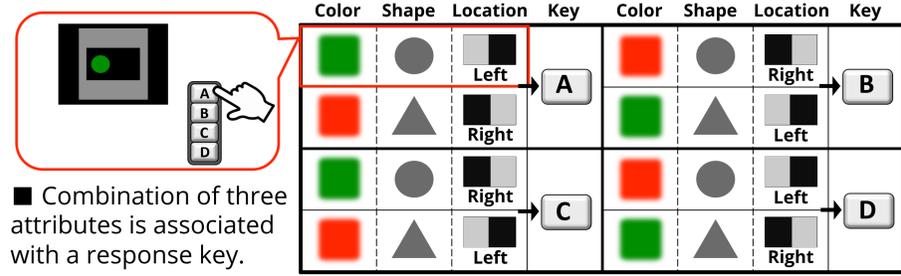
Purpose

Is there a superiority of the color-shape pair in S-R mapping after completion of learning?

→ We examined whether it is difficult to recall a correct response, if the color and shape or the color and location are presented separately.

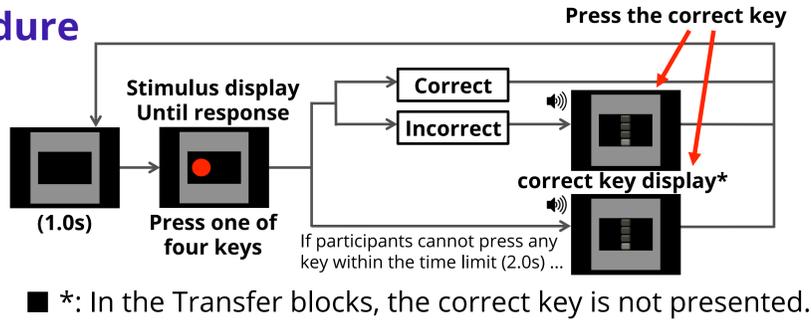
METHOD Participants learn the mapping of 8 stimulus items to 4 response keys, and then are tested with **Transfer** blocks.

Mapping between stimuli and responses



■ Combination of three attributes is associated with a response key.

Procedure

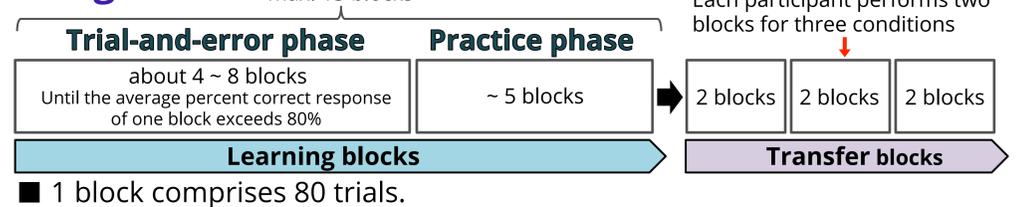


■ *: In the Transfer blocks, the correct key is not presented.

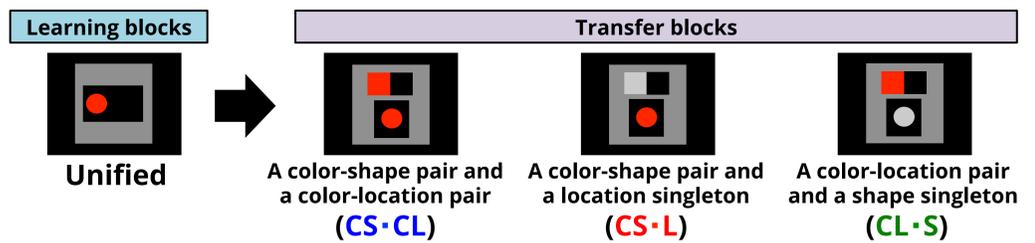
Participants

24 students aged 19-27 with normal or corrected vision.

Design

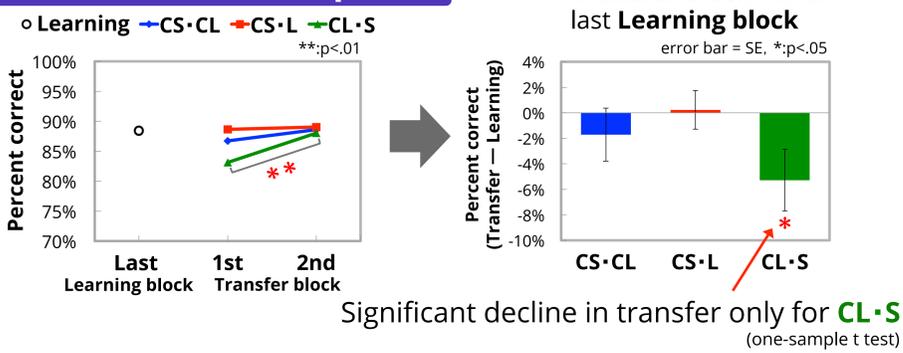


Condition



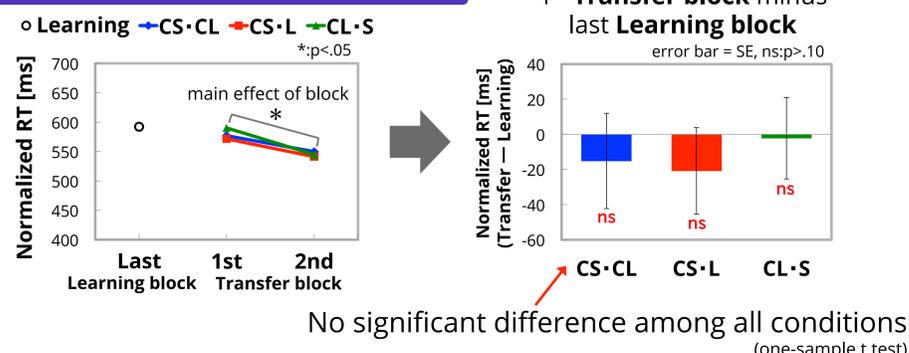
RESULTS & DISCUSSION

Percent correct response



Unless **color and shape** are derived from the same object, the rate of transfer declines. Separate presentation of color and location has no effect on the transfer.

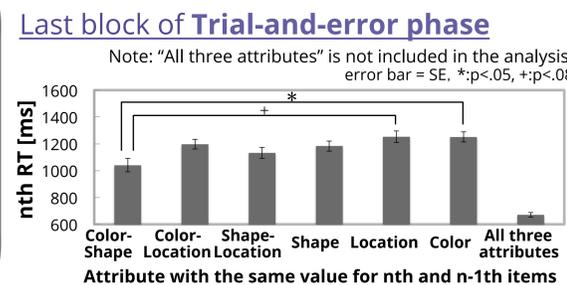
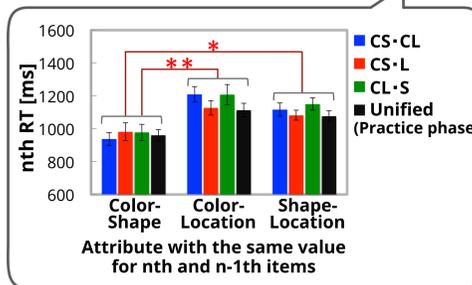
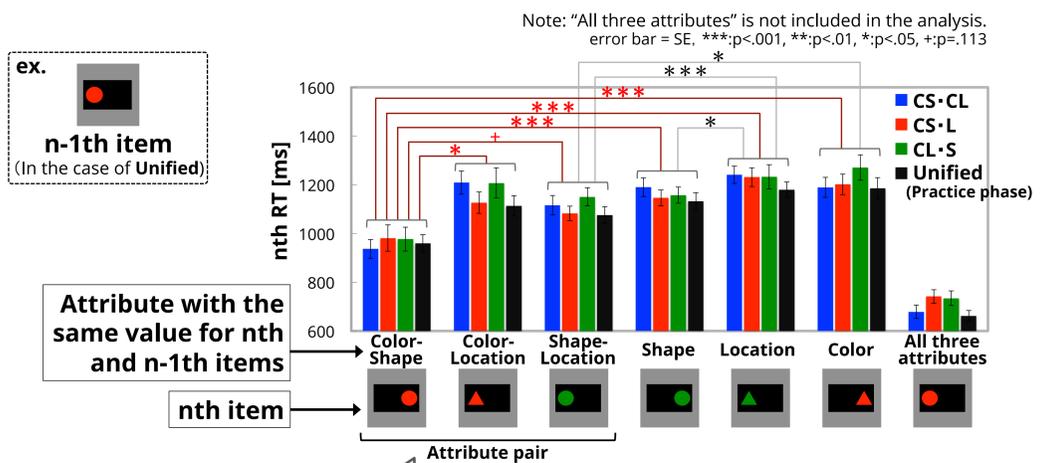
Normalized reaction time



In every condition the response is elicited almost as fast as that in the Unified condition.

Effect of features of n-1th item on nth RT

1st Transfer block and average of last three blocks of Practice phase



Only after completion of learning, RT is shorter if nth item is presented with the **same color-shape** as n-1th item.

Activation of connection from the color-shape pair to the response tends to remain.

CONCLUSION

- Spatially separate presentation of color and shape makes difficult to recall the response.
- Activation of connection from the **color-shape** pair to the response remains and **affects the subsequent response**.

→ In S-R mappings, **color-shape pair is considered to play an important role compared to color-location or shape-location pair.**

A neural net model modified from the one originally proposed by Ishizaki et al. (2015)

