**VISUAL AND MOTOR EXPERIENCES OF HANDWRITING CONTRIBUTE TO GAINS IN VISUAL RECOGNITION**

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**BACKGROUND**

Handwriting experience influences letter perception
- Handwriting increases letter recognition in preliterate children.
- Handwriting increases novel symbol recognition in literate adults.

Dynamic representations affect visual recognition
- Experience observing how an object moves is part of how dynamic representations are created.
- Handwritten letters contain movement cues that aid an observer in letter recognition, particularly when the cues are congruent with the observer’s writing style.
- Dynamic information about stroke order can aid letter recognition in impaired readers, but only when drawn in a typical stroke order.

**Research Questions:**
1. Is dynamic information encountered during handwriting influential in symbol recognition?
2. Is visual-motor experience with the symbol necessary or might visual experience alone be sufficient?

**Hypothesis:** Dynamic information encountered during handwriting is influential in recognition and the visual-motor experience of handwriting contributes to the formation of these dynamic representations.

**METHODS**

**TRAINING**
- Each symbol trained through one condition in only one stroke order 6 times each
- Videos for the Watch conditions were recorded during a yoked participant’s Draw conditions

**TESTING**
- Participants presented with symbols on which they had trained (targets) and novel symbols (distractors) in learned and unlearned stroke orders
- Forced choice: Did you learn this symbol? (disregarding stroke order)

**RESULTS**

A (Visual-motor: draw, watch) x 2 (Visual: ink, no ink) x 2 (Stroke Order: learned, unlearned) Repeated-measures ANOVA revealed 3 main effects, a 2-way interaction between Visual and Stroke Order, and a 3-way interaction.

**Stroke Order Main Effect:** Dynamic information encountered during learning influences recognition.

**Visual-motor Main Effect:** Self-production results in more accurate recognition than watching someone else produce.

**Visual Main Effect:** Experience with the visual percept results in more accurate recognition than not seeing it.

**Visual x Stroke Order Interaction:** Responses were more accurate when the symbols were presented in the learned stroke order than the unlearned stroke order when training included visual experience.

**DISCUSSION**

Visual-motor experience with symbols (i.e., handwriting) resulted in the greatest gains in symbol recognition.

One way that handwriting increases symbol recognition is through the formation of dynamic representations for the learned symbols.

The influence of dynamic representations in symbol recognition is largely related to the visual experience of seeing the symbol unfold.

**REFERENCES**