

# Learning to Write Again: Do Left-handers Truly Have an Advantage?

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## Abstract

A number of studies have been conducted to look at differences between left- and right-handed individuals performing different motor tasks (Walker & Henneberg, 2007; Judge & Stirling, 2003; Perelle, Ehrman & Manowitz, 1981; Nalçacı, Kalaycıoğlu, Çiçek & Genç, 2001). Walker and Henneberg (2007) included both left- and right-handed individuals writing with their non-preferred hand but they were limited in the number of left-handed individuals. This study aimed to gather an equal amount of left- and right-handed participants to write out a given sentence three times a day from a total of 28 days to see if left- or right-handers have an advantage in learning motor skills with their non-preferred hand. The participants were college-aged students who volunteered to be part of the study. Handedness was determined using the Dutch Handedness Questionnaire (Van Strien, 2002). Writing was assessed on day 1, 7, 14 and 28 on features such as rigidity of letters, consistency of the spacing of letters and words, and how much it varied from a sample of hand-writing taken from the participant from the beginning of the study. Participants also performed a grooved peg board test before and after the study with each hand to see if the writing practice influenced dexterity. The ratings from the writings were analyzed using a mixed ANOVA in order to see if there were any significant differences amongst left- and right-handers across days. Post hoc tests showed that there was a significant improvement in hand writing across days. Most learning occurred within the first two weeks of practice, regardless of handedness. There was a significant difference in writing improvement between left- and right-handers. In addition, the writing task showed no significant change in finger dexterity as a result of the 28 days of practice.

## Purpose

The purpose of this study was to see if either left- or right-handed individuals would have harder time learning to write with their non-preferred hand.

## Hypotheses

1. Left-handed individuals will improve while writing with their non-dominant hand significantly more than right-handed individuals, as determined by their hand writing rating scores from day 1, day 14, and day 28.
2. There will be a significant improvement between pre- and post-study Grooved Pegboard test times while using one's non-dominant hand.

## Methods and Procedures

### Participants

- College-aged volunteers (N=15, 7 left- and 8 right-handers).

### Before study

- Participants completed Dutch Handedness Questionnaire (Van Strien, 2002).
- Participants provided sample of normal hand writing.
- Participants completed Lafayette Grooved Pegboard Test (See Figure 1).

### During study

- Participants wrote statement, "The quick brown fox jumped over the lazy dog" 3 times a day using non-dominant hand for 28 days. (See examples in Figure 2)

### After study

- Re-tested on Grooved Pegboard and completed short survey.
- Hand writing assessed on consistency (on scale of 1 to 3) of letter shape, size, position relative to line, shaping of words, rigidity, roundness, and how similar it was to initial sample of hand writing.
- Analysis – 2 (groups) x 2 (times) Mixed ANOVA and a 3 (groups) x 3 (days) Mixed ANOVA both with Bonferroni post hoc test (alpha level set to .05)

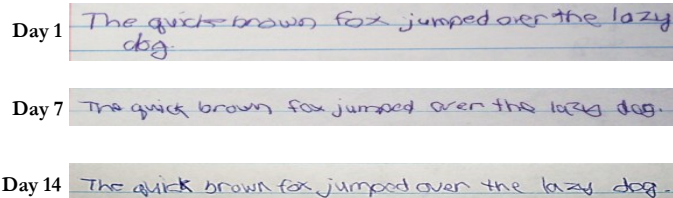


Figure 2. Samples of non-dominant hand writing

Figure 1. Lafayette Grooved Pegboard Task

(Lafayette Instrument Model 32025)

## Results

### Grooved Pegboard (Refer to Figure 1)

- No significant difference between pre- and post-means while using non-dominant hand,  $F(1, 13) = 0.224, p > 0.05$ .
- No significant interaction found between tests and writing hand group,  $F(1, 13) = 0.148, p > 0.05$ .
- No significant difference between the two writing hand groups (i.e. left or right) and pre/post-test means,  $F(1, 13) = 2.292, p > 0.05$ .

### Hand Writing Rating (Refer to Figure 3)

- Significant differences were found in writing hand rating scores across all days (day 1, day 14, day 28),  $F(2, 24) = 37.754, p < .0005$ .
- Significant differences were found among the groups,  $F(2, 12) = 6.025, p = 0.015$ . Left-handers had better ratings than right-handers.

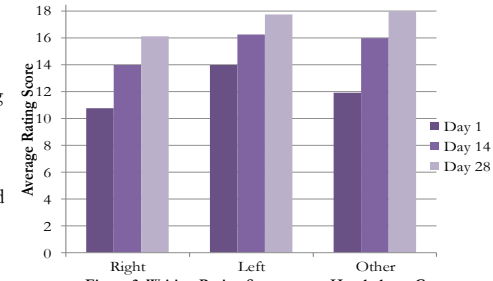


Figure 3. Writing Rating Score across Handedness Groups

## Discussion

Even though left-handers wrote better with their non-dominant hand than right-handers, hypothesis 1 was not supported as both groups improved their hand-writing about the same across the 28 days of practice. These results contrast those of Walker and Henneberg (2007) who found that right-handed individuals improved their hand writing more than their left-handed counterparts. A possible explanation could be due to a more equal number of left- and right-handed individuals in this study. They on the other hand only had three left-handed participants out of a total of 21.

The results of Grooved Pegboard Test did not support hypothesis 2 and showed that completing the writing assignment three times a day for 28 days did not improve one's finger dexterity with their non-dominant hand.

## Conclusion

1. Left-handers do have an advantage when learning to write with their non-preferred hand.
2. The writing assignment did not help participants improve their Grooved Pegboard Test times.

## Key References

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