Handwriting and Gender Analysis: Are boys messier than girls?

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Abstract

We asked The University of Texas at Austin Psychology 418 students (five females and five males) to write a short paragraph from *Little Women* and provide a random page of handwritten notes. Out of random students at the Texas Union, ten females and ten males were given two multiple-choice tests to determine the gender of the randomly compiled handwriting samples. The first test looked at the standard text and the second test looked at the random text. We hypothesized that participants would be able to guess the correct gender more than 50% of the time, and an overall mean of 56.5% supports the hypothesis. Participants were better at guessing the standard text gender with a mean of 64% than the random text with a mean of 49%. However, using an independent t-test with a set alpha level of .05, we found no significant difference between males and females’ ability to accurately guess the handwriting, \( t = .766 \) (\( df = 18 \)). When guessing the handwriting, participants said they associated tidy writing with females and messy writing with males.
Handwriting and Gender Analysis: Are boys messier than girls?

Predicting gender from handwriting samples remains a controversial subject. While research generally disproves the ability to identify character traits based off handwriting, empirical studies show validity in predicting gender from handwriting. In our experiment, my group and I collected random handwriting samples from male and female University of Texas at Austin students. Using these samples, we asked another set of random students to predict gender from the samples after looking at the sample for four seconds each. In a random sample, we hypothesized that the participants will be able to guess the correct gender of the handwriting sample more often than not.

In a study by John Sappington and Molly Money, they argued untidy handwriting correlated with pathology and indicated a male sex and gender role. Using a database of personality test protocols and a 5-point scale measuring handwriting tidiness, Sappington and Money examined gender roles and sex. For both sexes, high Masculine Gender Role showed confidence, fearlessness—among other traits—whereas high Feminine Gender Roles showed religiosity, tendency to abuse substances and lack of coarse language. Untidy handwriting scored high for Masculine Gender Role whereas tidy handwriting scored high for Feminine Gender Role. For the mean handwriting tidiness, men scored 1.8 and women scored 2.8, both with a standard deviation of 1.0. Handwriting tidiness correlated with ego strength of -.20, depression of .22 and mania of -.13, creating coefficients that were not high enough to have significant value. The lack of importance disproved the assumption that poor handwriting indicated negative personality traits. The weak correlation between handwriting and pathology also disproved Sappington and Money’s hypothesis. However, the correlation between handwriting tidiness and gender was -.37 for the Masculine Gender Role and .48 for the Feminine Gender Role. The
correlations between handwriting tidiness and gender roles were stronger than the depression traits, meaning “Masculine Gender Role predicted sloppy penmanship and Feminine Gender Role predicted tidy writing, independent of the writer’s biological sex” (Sappington et al., 2003).

In a different study, James Hartley expanded on Margaret Spear’s idea that either there are differences between boy and girl handwriting or that teachers accept the popular stereotypes about boy and girl characteristics. Influenced by Spear, Hartley argued that there are differences between boy and girl handwriting, so it is reasonable for teachers to accept the cultural stereotypes. Hartley’s experiment included asking 22 seven to eight year old boys and girls to copy a script in their own writing and imitate the other gender’s handwriting. When imitating writing, boys tried to make theirs “smaller and neater” whereas the girls said “almost unanimously that they had made their handwriting larger, and half of them said they had made it less tidy, or more scruffy” (Hartley, 1991). Hartley then asked two other groups of 20 seven to eight year olds to identify the gender of the copied and imitated scripts. The total correct judgments were 69% for original scripts and 52% for imitated scripts. For the original scripts, participants were better at recognizing their own gender’s writing with 75% accuracy for male judges guessing boy handwriting and 77% accuracy for female judges guessing girl handwriting. Even though the data showed that the seven to eight year olds were not very good at imitating handwriting, the data supported handwriting gender differences and the ability to recognize the differences—even at a young age. Biological, social and environmental conditions affected the outcomes, making handwriting an interesting area of sex differences to study.

Although influenced by Hartley, Vivien Burr’s study reinforced William Hayes’s results while finding more judging cues, checking the objectivity of the cues and determining the superiority of men or women judges. To ensure the participant used minimal handwriting cues,
Burr showed each person the handwriting for four seconds each before guessing the gender. Burr’s findings showed “that the students’ ability to correctly guess the gender of the writer was significantly better than chance, $z = -2.02, p < .05$” with fairly equal accuracy for males and females (Burr, 2002). Female handwriting was found to be neat, rounded and loopy while male’s was scruffy and spiky. Thus, Burr found more support for Hayes’s argument that minimal exposure to handwriting is enough to accurately guess gender.

Although the handwriting and gender relationship gained evidence in the United States, Sarah Hamid and Kate Miriam Loewenthal wanted to see if the relationship was true in a non-Western culture. The study in Pakistan examined gender handwriting differences in Urdu and English. Each participant copied a standard text in English and Urdu, and judges later categorized the copies by gender. When analyzing the data, “the MANOVA showed that language was not a significant source of variance ($F < 1$) and that gender of donor was highly significant, $F(1, 56) = 48.37, p = .0001$” (Hamid, et al., 1996). The MANOVA calculations indicated the same reliability and accuracy between handwriting and gender in Urdu and English.

Although E. Edward Peeples and Paul Retzlaff studied handwriting in relation to personality traits over gender, their data showed relevant gender differences. After male and female participants provided a handwriting sample and completed a personality assessment, researchers examined handwriting components that indicated personality traits. After collecting data, the authors point out “it is interesting to note that the females ($n = 168$) have fewer predictions than the males ($n = 76$)” (Peeples, et al., 1993). Results showed females’ handwriting predicts fewer traits than males’ with two traits for females and 12 traits for males. Since Peeples and Retzlaff’s data suggested there was a greater correlation between male writing and traits than females’ writing, this could be relevant to gender-writing data.
Examining the past research on the topic, my group constructed an experiment to test the relationship between handwriting and gender. After gathering randomly selected handwriting samples—one standard copied text and one freely from their notes—from the University of Texas at Austin students, we used the samples in the experiment. Each participant had four seconds to look at five female and five male handwriting samples. The participant was then asked to identify the gender of the author. Each participant repeated the procedure twice—one round for the standard copy and one for the randomly written. The dependent variable was the gender each participant guessed after looking at each handwriting sample. The independent variables were whether or not the writing sample is from a female or male, and the gender of the participant compared to his or her accuracy (ex: a male guesses a male, a female guesses a male, a female guesses a female, a male guesses a female). The outcome variable was the percent each participant guessed correctly. Since all participants were exposed to every condition, the design was within-subjects for both rounds of participation.

Using the described procedure, we hoped to find that in a random sample of 20 UT students, participants were able to guess the correct gender of the handwriting sample more than 50% of the time when presented with ten handwriting samples. Although we originally wanted to examine handwriting in relation to personality traits, no empirical evidence supported the relationship.

**Method**

**Participants**

The first round of participants was asked to provide a random and standard handwriting sample. The second round of participants was asked to look at a handwriting sample and guess
the gender of the author. Both sets of participants consisted of 10 female and 10 male randomly selected University of Texas at Austin students. We expected all participants to be in the 18-22 age range and be a variety of ethnicities which mimic the university’s total enrollment statistics (49.8% White only, 18.4% Hispanic, 4.5% Black total, 15.2% Asian only, .3% American Indian only, .1% Hawaiian/Pac. Islander only, 1.8% 2 or more, 9% foreign, .8% unknown; according to the Fall 2012 percent distribution). Participation was on a volunteer basis.

**Materials**

Each handwriting sample participant provided a random sheet of handwritten notes as well as a copied standard sample of writing. We provided plain, white printer paper and neutral writing utensils (black or blue pen, pencil) as well as the wording for the copied sample, a paragraph in *Little Women* by Louisa May Alcott. When conducting the experiment, we randomly used five female and five male handwriting samples from the collection. We assigned each sample a number to record data and ensured that the participants did not know the author. A stopwatch ensured that each participant had four seconds to look at each sample. The four seconds time limit let participants judge the sample based off of initial handwriting clues and not content. We recorded the gender guess as well as three clues the participant used to arrive at the guess.

**Design**

The dependent variable was the gender each participant guessed after looking at each handwriting sample. The independent variables were the handwriting samples and the gender of the participant compared to his or her accuracy (ex: a male guesses a male, a female guesses a male, a female guesses a female, a male guesses a female). Since all participants were exposed to every condition, the design was within-subjects for both rounds of participation.
Procedure

To gather handwriting samples, we asked random students in Psychology 418 to participate in the first stage of the experiment. We explained that we were researching handwriting analysis and participation was voluntary. If the person chose to participate, he or she copied a piece of text we provided (*Little Women*) as well as lent us a random sheet of handwritten notes. We continued this process until we collected samples from 5 males and 5 females. We assigned each sample a number to help in the rest of the experiment and indicated the gender. To conduct the experiment, we approached random students at the Texas Union to participate in guessing the gender of the handwriting author. We showed each participant 10 handwriting samples from the randomly written notes after selecting five female samples and five male samples from our collection. Each handwriting sample was shown for four seconds each to ensure the participant guesses based off handwriting and not content. After four seconds, we asked the participant to guess if a female or male wrote the sample. We also asked the participant to explain three reasons why he or she guessed the specific gender. We repeated the procedure again with each participant using give female and five male samples of standard text handwriting. Once all of the data was collected, we hoped to find accuracy in our hypothesis that in a random sample of 20 University of Texas students, the participants were able to guess the correct gender of the 10 handwriting samples more than 50% of the time. We will also examined differences between randomly written and standard handwriting gender guesses.

Results

In a random sample of 20 University of Texas students we hypothesized that, when presented with 10 handwriting samples, the participants were able to guess the correct gender of
the handwriting sample more than 50% of the time. To analyze the data, we performed an independent t-test with a set alpha level of .05. As Figure 1 shows, the mean differences were 1.8 (SD=2.098) for females and 1.2 (SD=1.317) for males. The data indicated that the mean differences were not significantly different between genders, $t=.766 (df=18)$.

<table>
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<th>Gender</th>
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*Figure 1. The chart shows the mean, standard deviation and standard error of the mean for male and female gender differences (df=18).*

*Figure 2. In figure 2, the mean gender differences are shown. The averages are 1.8 (SE=.66) for females and 1.2 (SE=.42) for males.*
“Type of Text Analysis”

Figure 3. In figure 3, the mean comparison between participants’ standard text and random text guesses is shown. Standard text has a mean of .64 ($SD=.03$) while random text has a mean of .49 ($SD=.02$).

Discussion

In a random sample of 20 University of Texas students we hypothesized that, when presented with 10 handwriting samples, the participants were be able to guess the correct gender of the handwriting sample more than 50% of the time. When presented with standard text, participants’ results supported our hypothesis with a mean of 64%. However, when presented with random text, the results did not support our hypothesis with a mean of 49%.

After participants guessed the handwriting author’s gender, we asked them to list reasons for guessing the specific gender. A common handwriting measurement was tidiness. Participants associated messy handwriting with males and tidy handwriting with females. The tidiness factor supported a study by John Sappington and Molly Money in which they argued untidy handwriting correlated with pathology and indicated a male sex and gender role. In the study,
using a database of personality test protocols and a 5-point scale measuring handwriting tidiness, Sappington and Money examined gender roles and sex. Untidy handwriting scored high for Masculine Gender Role whereas tidy handwriting scored high for Feminine Gender Role. For the mean handwriting tidiness, men scored 1.8 and women scored 2.8, both with a standard deviation of 1.0. The correlation between handwriting tidiness and gender was -.37 for the Masculine Gender Role and .48 for the Feminine Gender Role. The correlations between handwriting tidiness and gender roles showed “Masculine Gender Role predicted sloppy penmanship and Feminine Gender Role predicted tidy writing, independent of the writer’s biological sex” (Sappington et al., 2003).

Similarly, our results reinforced a study by Vivien Burr. Burr’s findings showed “that the students’ ability to correctly guess the gender of the writer was significantly better than chance, \( z = \text{-2.02}, p < .05 \)” with fairly equal accuracy for males and females (Burr, 2002). Female handwriting was found to be neat, rounded and loopy while male’s was scruffy and spiky. Just as Burr found males and females to be equally accurate in guessing handwriting, we found no difference between genders. Additionally, a study by Paul Thomas Young found “that men and women are about equal in their ability to determine the sex of the writer from handwriting” (1931). Thus, across time, males and females have both been able to detect handwriting differences with the same ability.

Looking at biological implications, John R. Beech and Isla C. Mackintosh studied if biological factors, such as a ratio of index to ring finger length, influenced handwriting and gender judgments. When analyzing the data, they “found that women’s right hand digit ratio correlated with relative sexuality of handwriting, but there was no corresponding relationship for the males” (Beech et al., 2005). Thus, prenatal hormones can influence female handwriting only.
Applying biological factors could explain why, in our experiment, females had a higher average difference ($M=1.8, SD=.66$) than males ($M=1.2, SD=.42$). William N. Hayes (1996) even argued handwriting is a “record of movement” since “people communicate their sex by the way they move.” Thus, development may be another biological implication of handwriting gender differences.

Despite supporting the handwriting and gender relationship, our study posed some limitations. One limitation was that our participants were not in a controlled environment when looking at the handwriting. Since we approached students at the Union on the University of Texas at Austin campus, they could have been distracted by their surroundings (i.e., noise levels, food smells, nearby friends, etc.), skewing the results as they lost concentration on the task. Another limitation was that we gave the assessment verbally to the first three participants before giving a written test. By asking the participants to say their answers aloud, they might have felt uncomfortable, saying answers they thought we wanted to hear instead of what they really thought. By keeping the same medium for all tests, the results would be more reliable.

Although our study supports previous research, the data also introduces new information. Most other studies do not look at differences between standard text and random text, but ours does. I thought that participants would be better at guessing the accurate gender for random text since there are more context clues such as writing in the margins, highlighter marks, etc. However, our data found no significant differences between the two types of text.

When conducting further research, I would experiment to find possible explanations for the differences in male and female handwriting. As participants often noted, people perceive females as having tidier handwriting than males. However, I want to explore why. As one author mentioned, handwriting tidiness could be affected by fine-motor skills. In addition to find-motor
skills, I would examine stereotype implications (do females try to write neater because they are
told girls must have neat handwriting?) and biological influences (hormones, genetics, hand-eye
coordination). It would also be interesting to conduct a twin study in regards to handwriting.

In various settings such as school or the workplace, people look at handwritten notes
when assessing assignments. Showing how handwriting predicts gender means people can
stereotype others based on gender when looking at handwriting. This could negatively affect
those in schools or work where gender equality is an ongoing problem. Another implication of
the handwriting analysis provides more support for gender differences and the role gender plays
in people’s lives. The nature verses nurture debate would be another angle to examine
handwriting from. Also, if handwriting is shown to be predictive of gender, then handwriting
might also predict other qualities such as personality traits. Studies such as this one open more
doors for the inclusion of handwriting in analytical settings. Although some people think
graphology has no merit, this study shows otherwise.
References


