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Jake Jadwin
Lindenwood University

Sara Robards
Lindenwood University

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Influences on Spelling Ability: Written vs. Oral Performance

Jake Jadwin and Sara Robards

The purpose of this study was to determine if spelling ability was affected by speaking or writing the spellings of the words. We further tested to see if vocabulary ability had any effect on spelling ability as well. Participants spelled two lists of ten words one list, was orally spelled and one list was written spelling. Upon completion of the spelling tasks, participants were asked to complete a vocabulary task. Participants' results were analyzed and conclusions were drawn based on written and oral performance and vocabulary ability. Our research revealed that participants spelled more accurately when writing the spellings versus speaking the spellings. Vocabulary was also slightly correlated to spelling ability.

The purpose of this experiment was to find out if participants were more successful at spelling words correctly when they were writing the spelling of words instead of orally stating the spelling of words. We chose to have each participant write the spelling of ten words and orally spell another set of ten words. Vocabulary ability was also investigated to see if it were related to spelling ability. Our study was to help determine if differences in individuals' spelling abilities differ when the person is speaking or writing words and if the person has a strong or weak vocabulary.

There has been an extensive amount of research done involving spelling techniques in other experiments. Experimenters have studied a broad variety of areas related to spelling. Rieben, Ntamakiliro, and Gonthier (2005) investigated the effect of inventive spelling on spelling ability. They recruited 148 kindergarten students to

participate in the study and assigned a student to one treatment group out of four. The four treatment groups were the invented spelling (IS) group, copied spelling (CS) group, invented spelling with feedback on correct spelling (ISFB) group, and drawing (D) group. These groups were tested on different measures involving spelling and the ISFB group scored the highest means on all the measures. Rieben et al. reasoned that inventive spelling allows children to make mistakes while learning and they can then learn from their mistakes. In regards to our study, this indicates that visually seeing the word as they write it out may alert the individual that the spelling they are writing is not correct or trigger the actual correct spelling in the process.

Holmes and Castles (2001) conducted an experiment concerning the surprisingly poor spelling ability of students who attended a university. In the study, they compared students who were poor spellers and students who were superior spellers. All of the students completed the following tasks of producing the spellings of words, recognizing authors, defining words and completed a questionnaire about reading and writing tendencies. The results of this study showed that the students with less spelling ability had less ability because they had insufficient knowledge of specific spelling of words. This was due to the lack of focusing on proper sequences of letters (Holmes & Castles). We relate this to our study because writing gives visual exposure to the sequences of letters. People can learn how important reading and writing a variety of words is for spelling ability as well as taking an active role in that kind of exposure. This also coincides with our idea that a broad, extensive vocabulary relates to better spelling.

In another study, Masterson and Apel (2006) investigated the spelling abilities of students in grades 2-6. Every student spelled words by writing them or typing them, but

before these tasks, every student participated in a task measuring words-per-minute to demonstrate their level of competence with a keyboard. The main interest in this study was to see the differences produced in spelling by writing or typing the word. Results showed spelling ability did not differ when these students wrote or typed words. When considering these results, we are not discouraged from our hypothesis because Masterson and Apel did not include an oral task. We want to include this factor in our study which can add on more detail from Masterson and Apel's study and further investigate what's involved in spelling ability.

Kelman and Apel (2004) conducted a case study involving an eleven-year-old girl to see what components of language such as phonemes and morphemes support spelling ability. In this study they found that including different linguistics elements in spelling lessons resulted in better spelling development for the eleven year old girl. Lily's abilities in spelling and reading were assessed before she was taught about phonemes (sounds in words) and morphemes (units in words) in spelling lessons. When Lily's abilities were tested after the lessons and she greatly improved or made fewer errors on spelling tests. By writing the word, the participant can recognize all these elements, therefore spelling more words correctly. Lily was taught about the sounds which also improved spelling but we do not think that this is the same as a participant orally spelling the word and hearing the letters as they spell.

Ward (2003) reviewed other studies that describe the inconsistencies between oral and written spelling capabilities. Drawing from the results of other studies, Ward proposed a model to explain these differences. Ward wanted to summarize research on oral spelling to grasp a better understanding on the interactions between factors of

spelling. It was discussed how oral spelling is an unusual task in the English language. One of the only times that oral spelling is used in English is when the spelling of a word is unclear or when the spelling cannot be assumed from the order of sounds. Writing is a form of communication whereas spelling words orally is not used as communication.

Two case studies were compared by Forde and Humphreys (2005) to examine two patients' ability to identify words that were orally spelled, reading skills, and spelling efficiency when writing or speaking the spelling. However the specific objective of the comparisons was to see if identification of words when orally spelled was contingent on either reading or spelling patterns. The two patients were referred to as FL and FK. Interesting findings arose when the certain previously mentioned skills of the patients were measured. FL and FK both had stronger reading skills than written and oral spelling. However, FK had better spelling skills when writing the words rather than using oral spelling. From these case studies, Forde and Humphreys concluded that recognition of spoken words is related to both spelling and reading which goes a step beyond what we are investigating.

Finally, Deacon and Bryant (2006) organized an experiment that focused on children's knowledge about morphemes. A positive correlation was shown between the level of morphological awareness that the children possessed and their success on standardized spelling tests. The researchers want to use the information they found to encourage children's growth in morphological awareness. Morphemes are the smallest structures in words that people visually recognize and seeing these structures is made possible by writing out the spelling of words. Therefore, when our participants are writing the words, they see the letters creating the morphemes in the words which gives

them an advantage over just hearing individual letters that make up a word when spelling it orally.

In our study, we expected to find that participants would spell words more accurately when writing the words as opposed to speaking the spelling. We also anticipated that participants who scored higher on our vocabulary task would spell more words correctly overall. Our reasoning is that writing gives visual cues that aid spelling ability. As we discovered from earlier research, many conditions affect accurate spelling of words. We propose that there will be a difference in accurate spelling when the conditions are either writing or speaking the spelling of words. Writing the words will result in more accurate spellings.

To investigate our hypothesis we used a within-subjects design and tested each participant in each condition so every participant was tested twice on spelling. An experimenter read all words to the participants from a list. The independent variables were whether participant wrote or orally spelled the words after they were read, and the dependent variable was the participant's performance on both the written and oral spelling tasks. We then used statistical analyses to quantitatively reflect on our data.

Method

Participants

Thirty participants consisted of eighteen female and twelve male college undergraduate students. There were a total of 30 participants. The participants were recruited through the Human Subject Pool at Lindenwood University. All of the participants were offered bonus points for their participation. The bonus points went

toward their introductory level psychology, sociology, and/or anthropology classes at Lindenwood. A demographic questionnaire revealed the following: when asked to compare their spelling ability to that of their peers, the majority, seventeen reported somewhat above average spelling ability. Participants were then asked to rate their ability to spell difficult words as compared to their peers and the majority of sixteen reported average ability. The next question asked participants to rank their desire to learn new words as compared to their peers and most participants (eleven) responded a somewhat above average desire. When asked about personal frequency of participation in word games seventeen being the majority, stated that they occasionally participate. Nineteen participants competed in a spelling bee and eleven participants have never competed in a spelling bee. The participants that did participate in a spelling bee were asked what their highest rank in the bee was and the results showed that most participants either did not remember their rank or received second place in the spelling bee. Information on the level of the spelling bee was then collected. Almost all of the participants participated in the spelling bee during grade school. Finally, the number of participants in the spelling bee was inquired. The highest reported number of participants in the spelling bee was seventy-one (see Appendices E, F, & G for participants' answers on questionnaire).

Materials

A questionnaire including demographic information was needed. The questionnaire was created by the researchers and included questions asking the participants to rank their spelling ability, their knowledge about spelling, the level of

interest the participant had in learning new words, if the participant engaged in word games, and if the participant had ever participated in a spelling bee. If the participant had participated in spelling bee, they were told to specify their rank(s) out of how many participants, and the level of the spelling bee. The questions were asked in the context that the participants answer in relation to their peers (see Appendix A for questionnaire). A list of twenty words was needed for this study. The list of words was divided into two groups of ten (see Appendix B). One list of ten words was spelled by participants orally and the other set of ten words participants spelled by writing. The order in which participants received the two halves of the original list of twenty words was counterbalanced among participants. The two list contained pairs of words matched based on work length and starting letter. All words that were chosen were at an eighth grade spelling level found on the internet.

Another part of the study involved a vocabulary task, adapted from <http://www.english-test.net/gmat/vocabulary/words/004/gmat-test.php>, which listed five vocabulary words with definition options provided to choose from (see Appendix C). Participants were also given a spelling improvement tip sheet upon completion of the study. Ideas for this sheet were borrowed from <http://puma.kvcc.edu/success/handouts/spelling/spelling.pdf> (see Appendix D). The study also used pens, sheets of lined notebook paper for the experimenters to record the participants' oral spelling of words, chairs, a desk, a table to sit at, and a cell phone. The experimenters handed out participant receipts, consent forms, questionnaires, vocabulary tasks, and feedback letters to the participants. Experimenters used a notebook, pen, and pencil to record data. All participants were run in Lab B in Young 105 for this study.

The lab was relatively quiet and adequately lighted. Inside the lab was a desk with a computer, a large table, and three to four chairs.

Procedure

The experimenters first needed to gather and create all the necessary materials for the study. The day before the experiment, the experimenters called each of the participants to remind them of their sign-up times. When participants arrived, they were asked to fill out participant receipts, the list of participants, two consent forms; one for the experimenters and one for the participant's personal record, and finally were asked to begin participating in the study. The experimenters gave a brief verbal set of instruction on what to expect. Once participants felt that they understood what was being asked of them, the experiment began.

The experimenter had a list of the twenty words divided into two groups of ten words. Depending on the order of the participant, an experimenter would read one group of ten words one at a time, pausing after each one to give the participants time to spell the word out loud to the experimenter. The experimenter recorded how the participant spelled the word on the datasheet. After that first group of ten words, the next ten were read to the participant one at a time. But, instead of verbally spelling the word back to the experimenter, the participant wrote the spelling of the word on a sheet of paper after each word was read. The order in which participants engaged in the two specific spelling tasks: oral and written was counterbalanced. The first participant spoke the spelling of the first group of ten words and then wrote the second group of ten, whereas the next participant wrote the spelling of the words first and then spoke the second group of ten words. After spelling the total of 20 words, the participant was given the questionnaire

and short vocabulary task to complete. Every participant was tested twice, which made this a within-subjects design. Upon completion, the participants were verbally debriefed, and asked if they had any questions. Then, the participants received the spelling tips improvement sheet along with a feedback letter which explained in detail the purpose of the study. The letter also provided the contact information of the experimenters in case the participant was to have future questions or interested in the results of the completed study.

Results

The results of this study revealed statistical significance between spelling words orally and spelling words in a written fashion. Participants spelled more accurately when they were writing the words rather ($M=7.27$, $SD = 2.164$) than speaking the spelling of the words ($M=6.40$, $SD = 2.094$), $t_{(29)}=1.867$, $p < .05$. To determine the relationship between spelling and vocabulary ability, we conducted a correlational analysis and found a weak correlation between vocabulary and overall spelling ability, $r = .072$. When the analysis was conducted separately comparing vocabulary and oral spelling, there was virtually no correlation, $r = .021$. But when vocabulary ability was compared to written spelling ability, there was a weak correlation $r = .103$. Our second hypothesis which stated that there will be a relationship between spelling and vocabulary ability was weakly supported (see Appendices F).

Discussion

Based on our results we obtained in our study we have rejected our null hypothesis, and thus accepted our alternate hypothesis concerning our first hypothesis. Statistical significance was found, meaning that there was a significant difference in the

amount of accurate spellings of words when participants wrote or spoke the spellings. Participants spelled the list of ten words more accurately when they wrote the spelling of the words. As for our second hypothesis, we found a weak correlation between spelling and vocabulary ability when spelling ability is defined as either written and oral spelling or just written spelling. There was virtually no correlation between spoken spelling ability and vocabulary ability.

One experimental design deficit that could have affected our findings was using a within-subjects design rather than a between-subjects design. If a between-subjects design, only one list of words would have been needed. Then every participant would be spelling all the words in only one way; either orally or written. In this study the participants had to orally spell and write the spellings which could have led to fatigue or practice effects that may have affected the participants' spelling accuracy for the second list of words they spelled.

Another potential design flaw was the words used in the two lists. The two word lists, while similar, were not entirely equal in word length and structure. One list had a word that appeared in the past tense and therefore had a suffix. The word was "dismissed". Participants did not always have the "ed" suffix and instead spelled "dismiss". They did not misspell any other words on the second list because no word with a suffix was presented. This could mean that they are not necessarily spelling the word wrong, rather they were spelling the word that they thought they heard the experimenter state. Either the lists of words should not have differed in tenses or we should have ensured the participants clearly understood the word being presented to them before they spoke or wrote the spelling of the word. Because the two lists differed, the

participants' spelling performance could have differed not because of the oral or written spelling factor but because the words on the two separate lists differed in sound clarity.

A general change that could have made the collection of data and the analyses of data easier was to make fewer open-ended questions on the demographic questionnaire. The participants could fill in whatever answer they wanted for the question number seven on the questionnaire. This led to multiple different answers meaning almost every participant answered differently. If the answers would have been set, participants would have had fewer options and the answers would have been more standard. There was also confusion of what to answer if the participant did not remember or know the answer to the question. If there were set answers, an option could have been "I do not know or I do not remember." Participants would have been less confused and entering data would have been simplified. We also learned after we analyzed our results that a content analysis would have eliminated this problem.

When analyzed separately, oral spelling virtually had no correlation to vocabulary ability, but written spelling revealed a weak correlation to vocabulary. We believe that this is because written spelling is more similar to the format of the vocabulary task. The vocabulary task consisted of five questions that were to be read and answered in a written fashion on a piece of paper by the participant. The participant also wrote the spelling of the words for the written spelling on a piece of paper sharing the written component with the vocabulary task.

If a later study conducted a more in depth vocabulary task, it might reveal a greater correlation between spelling and vocabulary ability. Our vocabulary task was very short and did not provide much of an opportunity for the participant to show broad

vocabulary knowledge. Perhaps if participants were tested more thoroughly on vocabulary knowledge, the test would better represent their vocabulary ability. A more accurate correlation between spelling and vocabulary ability could then be studied. A future study could detect more of true correlation and would not allow as much error in analyzing oral and written spelling ability due to some improvements that can be made. Our significant findings in our study may encourage other research that can be applied to areas of education in speech, spelling, and vocabulary. Spelling techniques will be more effective if we know what conditions affect spelling ability.

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Author Note

Jake Jadwin, Psychology Major; Sara Robards, Psychology Major, Lindenwood University.

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Any questions/concerns about our paper should be addressed to Jake Jadwin, undergraduate psychology student, Lindenwood University, St. Charles, MO 63301. E-mail jaj762@lionmail.lindenwood.edu or Sara Robards, undergraduate psychology student, Lindenwood University, St. Charles, MO 63301. E-mail: ser442@lionmail.lindenwood.edu.

Appendix B

List of words to be spelled

- | | |
|----------------|-----------------|
| 1. Because | 1. Believe |
| 2. Thoroughly | 2. Tremendous |
| 3. Accumulate | 3. Appropriate |
| 4. Spacious | 4. Sufficient |
| 5. Dismissed | 5. Diameter |
| 6. Mannequin | 6. Memento |
| 7. Consequence | 7. Criticism |
| 8. Instructor | 8. Inference |
| 9. Reconstruct | 9. Referral |
| 10. Structural | 10. Sentimental |

Appendix C

Vocabulary Task: Please circle the correct answer for each question

1. v. to cancel; to invalidate; to annul
 - a. nullify
 - b. chastise
 - c. behoove
 - d. implement

2. v. to annoy; to irritate; to wear away; to make sore by rubbing
 - a. desecrate
 - b. chafe
 - c. aggrandize
 - d. affiliate

3. v. to tempt; to torment
 - a. innovate
 - b. tantalize
 - c. supplant
 - d. abandon

4. v. to combine; to join; to confederate; to merge; to unite
 - a. conjoin
 - b. rout
 - c. prate
 - d. spurn

5. v. to make a journey; to migrate
 - a. ruminare
 - b. batten
 - c. conjure
 - d. trek

Adapted from <http://www.english-test.net/gmat/vocabulary/words/004/gmat-test.php>

Appendix D

Spelling Tips

1. Make it a rule to use the dictionary.
2. Keep a list of words that you misspell and study the words individually.
-Examine the word, say the word, spell it, write it, make connections to the word, Incorporate it in your vocabulary, and study it repeatedly.
3. Become an expert in the vocabulary of your major subject.
4. Be familiar with the spelling of common words and build upon them.
5. Learn spelling rules of the English language including, ie/ei combinations, prefixes, suffixes, plurals, and consonants etc.

For more information in detail go to
<http://puma.kvcc.edu/success/handouts/spelling/spelling.pdf>

Borrowed Ideas from <http://puma.kvcc.edu/success/handouts/spelling/spelling.pdf>

Appendix E

Overall Spelling Ability

Participant's Response	Frequency of Response Among Participants
well above average	1
somewhat above average	17
average	9
somewhat below average	1
well below average	2

Ability to Spell Difficult
Words

Participant's Response	Frequency of Response Among Participants
well above average	2
somewhat above average	4
average	16
somewhat below average	8
well below average	0

Desire to Learn New
Words

Participant's Response	Frequency of Response Among Participants
well above average	1
somewhat above average	1
average	9
somewhat below average	11
well below average	8

Frequency of Playing Word Games

Participant's Response	Frequency of Response Among Participants
Never	11
Occasionally	17
Often	2

Appendix F

Have You Participated In A Spelling
Bee

Participant's Response	Frequency of Response Among Participants
Yes	19
No	11

If You Participated, What Was Your Highest
Rank

Participants Response	Frequency of Response Among Participants
First	1
Second	4
Third	1
Fourth	1
Fifth	2
Seven out of ten	1
Twenty out of Twenty- Three	1
Knocked after 1st round	1
Almost Last Place	1
Don't Know	3
Don't Remember	4
N/A	2

What Level Was the Spelling Bee

Participant's Response	Frequency of Response Among Participants
First Grade	2
Second Grade	2
Third Grade	2
Fourth Grade	4
Fourth and Fifth Grade	2
Fifth Grade	6
Grades 4-6	1
Grade School	1

N/A	1
-----	---

Appendix G

How Many People Were in the Bee

Participant's Response	Frequency Of Response Among Participants
Six	1
Ten	2
Twenty	4
Twenty-Three	1
Twenty Through Twenty-Four	1
Twenty-Five	1
More or Less Than Twenty	2
More Than Twenty	1
Thirty	2
More Than Thirty	1
Seventy-One	1
The Whole Class	1
Don't Know	2
N/A	1