The Power of Speech: Speech-Recognition Software in the Writing Process

Individual writing conferences—whether in writing centers or as extensions of composition classroom instruction—presume that talk about writing improves students’ writing. Writing studies scholars have discussed the benefits of prewriting or revising using speech. For instance, Leander and Prior (2004) have shown how such conversations between students and teachers make their way into students’ writing. Woerkum (2007) has likewise demonstrated how considering readers’ oral responses can help technical writers integrate natural speech rhythms into their revisions. Elbow (2012) suggests these natural speech rhythms can mitigate several difficulties of writing, from prewriting to revision.

Although these scholars have contributed valuable insights about the relationship between speech and writing, much of their information comes from intuition and observation rather than empirical research. Scholarship that has investigated the speech-writing connection has begun, but mostly in fields outside of writing studies. For example, educational psychologists have studied the potential of using speech recognition technology for those with learning disabilities. Further, the “phonological mediation hypothesis,” as developed by neuropsychologists, states that especially in beginning writers, the spoken form of the word has to be retrieved in order to write the word (Peronne-Bertolotti et al. 299), suggesting an inherent link between speech and writing. However, other neurological research shows that the written word and the spoken word engage different parts of the brain (Regev et al; Strauss). Taken
together, this research suggests that while speech and writing seem to be inherently linked, composing aloud, or even speaking while typing, engages additional parts of the brain, thus creating a different writing experience and, possibly, a different final product.

While composition scholars have speculated about the link between speech and writing and psychologists have demonstrated both their distinctness and their commonality within the brain, neither field has empirically looked at how specific practices could take advantage of these connections to improve writing. One practice that requires further inquiry is the use of speech recognition software in writing. Advances in speech recognition technology prompt scholars to consider the role of speech in the composing process and its implications for writing and writing instruction.

This paper reports on a preliminary study I conducted doing just that: testing how students perceived the experience of composing out loud and how it seems to change their writing. The study, involving three students who composed out loud using speech recognition software and then talked about their experience, tested the hypothesis that compared with writing silently, composing aloud improves the naturalness and readability of student writing. In addition to testing this hypothesis, I also sought to discover how the software might best be used in students’ writing process (see post-test interview question in Appendix A). While the limits of the study made it difficult to confirm whether composing aloud directly improved readability, the interviews with students afterwards did reveal that using speech recognition software is an effective way for students to get their ideas on paper without worrying too much about the specific language, which seems to lead to better thought out, better expressed ideas. However, the product of this composing aloud usually needs heavy editing to turn it into a paper, which makes the software more practical for outlining or brainstorming than actual writing.
Methods

The three students involved in this preliminary study were selected from the FYC class that I teach. I chose students that represented a variety of strengths and weaknesses in writing in order to analyze the usefulness of speech-recognition software for different types of writers.

These students engaged in a three-part process. First, they answered questions about their typical writing process (see Appendix A for a list of questions). Next, they spent fifteen minutes using the dictation capability included in a MacBook Pro’s Yosemite Operating System. The prompt they answered was, “Write a paragraph persuading me that a song you hate (that some people like) is truly a dumb, worthless song.” This prompt mirrored the prompt of a one-page assignment they completed at the beginning of the semester, which asked them to answer the same prompt about a movie instead of a song. The students were instructed to use the software however they chose (speak everything first and then edit, go sentence by sentence, etc.) as long as they used the speech-recognition software to do the actual writing, at least in first getting the words on the page. Finally, I interviewed the students about their experience composing aloud and what they think about using speech-to-text software in their future writing (see Appendix A).

After collecting this data, I analyzed my results by first comparing the paragraph they produced to their original movie response to see whether there were any notable differences. Next, I conducted basic coding of the interviews, marking the responses that were common among multiple students. Finally, I performed selective coding of the interviews, looking for differences in how the participants viewed the relationship between speech and writing, a factor that became significant in the first two stages of analysis.

Results

Comparative Analysis: Did composing aloud improve readability of writing?
I originally hypothesized that composing out loud would improve the readability and naturalness of student writing. While the preliminary nature of this study (and, thus, the lack of a true control group) made this difficult to assess, I was able to draw some basic conclusions by comparing the “worst movie ever” essay to the “worst song ever” essay. The results were mixed.

Shannon, (all names have been changed) the most expert writer of the three, already had a fairly natural tone to her writing, with varied sentence structure and witty statements somewhat foreign to first-year students’ writing (but not their speech), like “[the characters] have forgotten to emote.” Her spoken text had similar virtues, though perhaps to a lesser degree because of the time limit. However, while the readability of her writing was perhaps not affected much, the central idea was a bit more complex on the spoken text (as she herself pointed out). While the movie essay focused on the typical criticisms for the movie she was discussing—overdone special effects, wooden acting, etc.—the song essay focused on the idea that “Get Lucky” might be catchy, but it’s not going to be the song of anyone’s teenage years because it’s just one layer—“it’s just the hook.” This seems to illustrate that she was able to go beyond clichés when she talked through her idea as opposed to just writing silently.

The results were rather different for the next participant: Lindsey. While her ideas are often excellent, they can sometimes be hidden behind long sentences and convoluted wording. I was disappointed to see that composing aloud didn’t seem to change that much. In her movie essay, we find phrases like “provided me with some of the hardest laughing,” and in the song essay, we find a similar “resulting in further dislike and annoyance.” While it seems like composing aloud would improve that kind of wording (because nobody speaks like that), I learned in the interview that Lindsey kept very little of what she originally spoke. Instead, she would get the words out, then edit and rearrange them to be “how [she] wanted them to be.”
While I don’t have a record of what her sentences were like before, I’ve never heard her actually talk this way, so we can reasonably assume that these complex word combinations arose during editing.

Although Shannon and Lindsey didn’t seem to write differently when composing aloud, my hypothesis did prove true for the final participant, Catherine. While her language was fairly readable in the movie essay, it was also full of transitions like “to start off” and “for instance” that made the piece seem more formal and academic than was necessary for this type of fun, casual prompt. The song essay didn’t have any phases that stuck out as overly formal and instead employs a pleasant, conversant tone that asks and answers sarcastic questions to poke fun at the song (“Did you ever think maybe he’s not the right guy for her?”). In Catherine’s case, the process of composing aloud did seem to make her writing sound more natural.

Qualitative analysis: common themes in interviews

Pros and Cons of Software

While the results for the comparative analysis were inconsistent, the results of the interviews were, surprisingly, much more consistent. Despite using somewhat different processes to compose aloud, all three participants expressed similar feelings about the benefits and drawbacks of the software. All three of them expressed frustrations with the limitations of the software: it would capitalize letters every time you paused, it would hear and record the wrong word, it would take a while to catch up to what they were saying, or it would record everything they said, even if they backtracked mid sentence and repeated or corrected themselves. Because of these difficulties, the participants admitted that it would be difficult to write a serious draft this way.
However, despite these drawbacks, all three participants seemed to find value in the experience and said they would consider using the software in the future. They wouldn’t use it for a final draft, but they would consider using it to brainstorm or even write a first draft (which, they have learned in my class, is usually just another level of brainstorming). This is because each of them acknowledged gaining something from writing this way. For Shannon, composing aloud helped her explore her ideas more; rather than taking the first idea she came up with and running with it, as she normally does, she said she was able to dig deeper because when speaking “nothing is super permanent.” Lindsey likewise acknowledged that writing this way was easier for her because rather than repeating and rewording sentences in her head before writing, she was able to not worry how it sounded at first and just get something on paper so she could then go back and edit it. Catherine also said that composing aloud helped her to just write without worrying as much about the exact wording but also added that it helped her write more naturally because she had to consider what her writing actually “sounds like to a person.” While these reasons for valuing the software were slightly different for each participant, they all stem from the same idea: that speaking feels less permanent than writing, which allowed them to worry less about the exact phrasing and more about the ideas they were trying to convey.

Perception of Relationship between Speech and Writing

Another element of these interviews that becomes significant when analyzed along with the written product is each participant’s perception of the relationship between speech and writing. Shannon, a long-time speech and debate participant, admits that her experience with public speaking has allowed her to “break down the barrier between conversation and presentation.” She sees them as inherently linked and often speaks aloud to herself while writing in order to break through writers’ block and ensure that her tone doesn’t become too stilted. As
her teacher, I can say that this belief in the relationship between speech and writing is apparent in her appropriately academic yet conversational tone.

Lindsey, on the other hand, expressed a belief in the distance between speech and writing. When asked if she didn’t like how the spoken writing sounded when she first read it, she responded that “it would sound too common, like everyday talk, so I had to reword it to make it sound a little more academic.” This statement sets up a binary that something either sounds like everyday talk or it sounds academic. In Lindsey’s mind, speech and academic writing seem to be unrelated.

Catherine’s perspective was, once again, somewhere in the middle. She didn’t explicitly discuss the link between speech and writing the way Shannon did, but she seem to grasp that writing sounds better when it is similar to the way people talk. She said, “A lot of times I just kind of write and I formulate sentences but they don’t quite make sense like how you would normally talk… [This speech-to-text technique gives writing] a tone that you usually talk in instead of just a formulaic [tone].” And as discussed in the comparative analysis section, composing aloud did, in fact, help Catherine achieve this tone, perhaps at least partially because she saw the value in it.

**Discussion**

Through the comparative analysis of the movie and song essays, we can conclude that composing aloud can, but doesn’t automatically, improve the naturalness and readability of writing. Based on the interviews, the deciding factor in whether students adopt a more conversational tone through the process may have been how they perceive the relationship between speech and writing. Students that see a strong relationship between the two will generally strive for a more speech-like tone, and for students like Catherine who don’t
necessarily achieve this tone naturally, speaking aloud may help them write more naturally. However, since this type of writing inherently requires extensive editing, students like Lindsey who don’t necessarily see the connection between speech and writing may choose to edit out the conversational tone in an effort to sound more academic. Therefore, for this software to help students achieve a more conversational tone, teachers would first need to emphasize the relationship between talk and text and the value of having a conversational tone.

In addition to revealing the importance of students’ perception of the relationship between speech and writing, the interviews also revealed that, while potentially difficult for serious drafting, composing aloud could be used effectively in brainstorming. Particularly for students who are sometimes paralyzed by the pressure of finding the right words (a common problem researchers observe [Cleary 673]), or students experiencing writers block, this software could help students focus more on ideas than words (as the interviews revealed), thus allowing students to get their thoughts on the page without feeling as nervous about the language.

Conclusion
While speech-recognition software certainly isn’t the only way to use speech to brainstorm, it is a useful option with unique benefits. Talking about writing with a tutor or friend (especially when that tutor responds as a reader/listener more than a teacher [Mackiewicz and Thompson 168]) can be useful, but it presents the problem of needing to remember what was said later using, at most, some cursory notes. Free writing, or, as Elbow describes it, deciding to “upshift into our speaking gear and let words roll out unplanned,” might also help students overcome concern about finding the right words (143), but there are still students who still struggle to get something out while they are free-writing, simply because writing is less natural for them than speaking. As the participants in this study expressed in their interviews, speech recognition
software can overcome the constraints of simply talking or simply writing by allowing students to talk through their idea with themselves and record them without having to think too much about language, furiously scribble, or remember what was said in a discussion. While simply recording a conversation might have the same effect as far as memory goes, speech-to-text technology has the added benefit of allowing students to actually use the words on the page if they turn out to be relevant. Although we might need more effective and affordable software before this technology can be used widely in classrooms, speech recognition software has the potential to help with common problems like writers block or convoluted language. It even has the potential to help students like Lindsey better understand the relationship between talk and text by showing them how their own speech, without revision, can sometimes be more clear and more natural sounding than their well-thought-out writing. As the technology improves and more research is done into the ways to best use this software, speech-to-text software could become an important part of composition pedagogy, helping especially those students whose fixation on finding the right words hinders their ability to express their ideas.

**Future Research**

While this preliminary study was a good start, more research needs to be done before we can understand exactly how speaking can affect writing or even how speech-recognition software can be used in writing. Though this study did give me some interesting insights about how composing aloud could be used to teach composition, it also exposed some problems with the study that future research could rectify. For those who seek to take up the banner of speech recognition software research, I make four main suggestions. First, I suggest using top of the line software such as Dragon Dictate that will minimize frustration and maximize usefulness for students. Second, researchers should record what the students actually say as they compose,
which can give them a better knowledge of how much editing the student does and whether their own editing helped or hindered the potential of the software to harness the natural sound of speech. Third, more conclusive results could be drawn from a large sample size doing both a control exercise (composing normally) and a test exercise (composing with the software) with a similar prompt conducted several weeks apart. And fourth, I advise giving participants more explicit instructions about how to use the speech-recognition software to control for differences based solely on how they choose to use the software. Together, these changes will allow researchers to get a more accurate picture of how composing aloud changes the final written product compared to composing silently.

Beyond research that compounds on my pilot study, this study opens the door to a variety of research about using speech in the writing process. Future research should investigate the possibilities of using other technology, such as recording devices or text-to-speech software, as part of the writing process. Traditional methods of using speech in writing, such as reading papers out loud (see Adams 3) or “speaking onto the page” (Elbow 139), should also be studied empirically to understand exactly how (and why) these methods seem to improve writing.

Overall, although composition scholars have theorized the value of using speech in writing, there is much we can still learn about how to practically use speech in our classrooms. This preliminary study is hopefully the first of many studies that follows after the research already being done in other disciplines to (1) discover the relationship between speech and writing and (2) develop useful pedagogical theories based on empirical research. The results of this study reveal the possibility of using speech-recognition technology to brainstorm and overcome writer’s block that often comes from a fixation on wording. Other studies might reveal how other techniques can help students pick up on convoluted phrasing or incomplete ideas. As
we investigate the potential of speech more, we will be able to use specific practices to meet specific student needs. We already know that “speaking is easy” while “writing is hard” (Elbow 60; 71). Now we need to devote more energy to figure out how to make writing easier through speech.
Appendix A

Questions Asked before the composing aloud interval:

What is your writing process usually like (discuss prewriting, drafting, and revision)?

Is speaking usually involved in any stage of writing for you?

Do you ever talk aloud while you are writing?

On the very first assignment (worst movie ever essay) how long did you spend writing?

What do you think your biggest strengths and weaknesses are in writing?

Questions Asked after the composing aloud interval:

Did the equipment work well for you?

What was the process you just used to compose out loud?

What did you enjoy about the process?

What was frustrating about the process?

How do you feel about the final product?

Would you say composing out loud changed your writing at all? What, as you see it, are the differences?

Do you think it took you more or less time to compose as it would have if you were following your typical writing process?

If you had access to this software, would you choose to write like this again? Under what circumstances would you compose out loud?

Which stages of the writing process would you use it in?
Works Cited


"Interview with Lindsey." Personal interview. 17 Nov. 2014.

"Interview with Shannon." Personal interview. 14 Nov. 2014.

"Interview with Catherine." Personal interview. 14 Nov. 2014.


