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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. Composition scholars have discussed the benefits of prewriting or revising using speech. For instance, Leander and Prior (2004) have show 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, neuropsychologists’ “phonological mediation hypothesis,” which states that beginning writers must retrieve the spoken form of a word in order to write it (Peronne-Bertolotti et. al 299), posits 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, when compared to composing silently.

While composition scholars have speculated about the link between speech and writing and psychologists have demonstrated the distinctness and commonality of both activities within the brain, neither field has empirically examined how individuals could use elements of speech to improve writing. One promising area of research is the use of speech recognition software in the composing process and its implications for writing instruction. Such software has the potential to combine the power of speech and writing in productive ways, perhaps by helping students talk through their ideas without feeling bound by the formalities of written language.

This paper reports on a preliminary study that tested how students perceived the experience of composing out loud and how it changed their written product. 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 revealed that using speech recognition software helps remove the distractions associated with correctness in writing, allowing students to focus on articulating ideas. However, the product that comes from composing aloud usually needs heavy editing to turn it into a paper, which makes the software most useful for outlining or brainstorming rather than formal drafting.

Methods

The three research participants 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). Next, they spent fifteen minutes composing privately in a room, using the dictation capability included in a MacBook Pro's Yosemite Operating System. During this interval, they composed a "worst song ever" paragraph persuading an adversarial audience to agree with their assessment of the song's merits, a task that mirrored the "worst movie ever" assignment they completed earlier in the semester. These prompts were designed as a diagnostic test of general writing ability because, due to the familiar topic, students tend to be able to respond to these prompts without doing extensive research or brainstorming. 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. Following the timed writing, I interviewed the students to gather information about their experience composing aloud and their thoughts on using speech-to-text software in their future writing (see Appendix A).

I collected and analyzed results by comparing the paragraph students produced with their previous assignment 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 and led to mixed results, I was able to draw some basic conclusions about how the software affected the written product, regarding both the readability (what I tested for) and the quality of ideas (an unexpected result of the comparison).

For Shannon (pseudonym), the most expert writer of the three, composing aloud didn't seem to improve readability, not because her text wasn't readable, but because she already had a fairly natural tone to her writing before the exercise. Her original "worst move ever" response was marked by varied sentence structure and witty statements, and her spoken text had similar virtues. However, while the readability of her writing was not affected, 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. This seems to illustrate that, while the software didn't necessarily improve readability, it still had an affect on the written product in that she was able to go beyond clichés when she spoke through her ideas, as opposed to just writing silently.

The next participant, Lindsey, also exhibited no notable change in the naturalness of her writing, although she started on the opposite side of the spectrum. Both her original text and her spoken text were plagued by long sentences and convoluted phrasing like "provided me with some of the hardest laughing" (the movie essay) and "resulting in further dislike and annoyance"

(the song essay). While it seems like composing aloud would improve that kind of wording (because such elaborate constructions in natural speech are rare), I learned in the interview that Lindsey edited heavily and kept very little of what she originally spoke. 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, however, didn't have any phrases that stood out as overly formal and instead employed a pleasant, conversant tone that asked and answered sarcastic questions to poke fun at the song. 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 expressed frustrations with the limitations of the software: it would capitalize letters after pauses, record words wrong, take a while to catch up to what they were saying, or record everything they said, including mid-sentence revisions. Because of these difficulties, the participants admitted that it would be difficult to write a lengthy, formal draft this way.

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 might use 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. 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 automatically, 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 natural 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 as 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.

While this preliminary study illustrated the potential of speech-recognition software, more research needs to be done before we can understand exactly how speaking can affect writing. For those who seek to take up the banner of speech recognition software research, I make four main suggestions of how this study might be improved and expanded: (1) use advanced software such as Dragon Dictate; (2) record what students say as they are composing; (3) have a large sample size do a control exercise, composing normally, and a test exercise, using the software, several weeks apart; and (4) provide explicit instruction on how to use the speech-recognition software. These four suggestions will remove some of the possible extraneous variables that may have affected this preliminary study, thus allowing researchers to get a more

accurate picture of how composing aloud changed the final product compared to composing silently.

Beyond research that compounds on my pilot study, other research could be done to investigate how we can use speech to inform writing. This preliminary study is hopefully the first of many studies to follow 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. 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. 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). Moving forward, we should 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

- Adams, Joyce. "Engaging Students in Writing Labs: An Empirical Study of Reading and Commenting on Student Papers." *International Journal of Education* 1.1 (2009): 1-9. *HBL Digital Collections*. Web. 13 Dec. 2014.
- Cleary, Michelle. "Flowing and Freestyling: Learning from Adult Students about Process Knowledge Transfer." *College Composition and Communication* 64.4 (2013): 661-87. Print.
- Elbow, Peter. *Vernacular Eloquence: What Speech Can Bring to Writing*. Oxford: Oxford UP, 2012. Print.
- "Interview with Lindsey." Personal interview. 17 Nov. 2014.
- "Interview with Shannon." Personal interview. 14 Nov. 2014.
- "Interview with Catherine." Personal interview. 14 Nov. 2014.
- Leander, Kevin, and Paul Prior. "Speaking and Writing: How Talk and Text Interact in Situated Practices." *What Writing Does and How It Does It: An Introduction to Analyzing Texts and Textual Practices*. Ed. Charles Bazerman and Paul A. Prior. Mahwah, NJ: Lawrence Erlbaum Associates, 2004. 201-38. Print.
- Mackiewicz, Jo, and Isabelle Kramer Thompson. *Talk about Writing: The Tutoring Strategies of Experienced Writing Center Tutors*. New York: Routledge, 2014. Print.
- Perrone-Bertolotti, M., L. Rapin, J.-P. Lachaux, M. Baciú, and H. Løevenbrück. "What Is That Little Voice inside My Head? Inner Speech Phenomenology, Its Role in Cognitive Performance, and Its Relation to Self-monitoring." *Behavioural Brain Research* 261 (2014): 220-39. Print.

Regev, M., C. J. Honey, E. Simony, and U. Hasson. "Selective and Invariant Neural Responses to Spoken and Written Narratives." *Journal of Neuroscience* 33.40 (2013): 15978-5988.

Print.

Strauss, Evelyn. "Writing, Speech Separated in Split Brain." *Science*. Sciencemag.org, 8 May 1998. Web. 3 Nov. 2014.

Woerkum, C. Van. "Orality and the Process of Writing." *Journal of Technical Writing and Communication* 37.2 (2007): 183-201. Print.