Temporal Adverbial Clause Positioning and Dyslexia

by

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ABSTRACT

Temporal adverbial clauses are present in many forms of writing. These clauses can impact the complexity of a sentence. Sentence complexity can have some effect on how readers with a diagnosed reading disability, such as dyslexia, process language. This study incorporated Hawkins' (1994) theories about Early Immediate Constituency into a self-paced reading task designed to evaluate whether or not temporal adverbial clause positioning caused the main clause of the sentence to become more difficult to understand. Hawkins theorized that main clauses appearing at the beginning of a sentence would create an environment where a reader could reach sentence comprehension faster (CITE). The experiment used software called Linger to present the self-paced reading task. Eight participants – four with dyslexia and four without – volunteered to read sentence items from a college level textbook that had temporal adverbial clauses appearing before and after the main clause of sentences. Statistical significance in the findings show that participants read sentences more quickly when the temporal adverbial clause appeared before the main clause; however, more research is required to determine the difference between sentences fronted by adverbial clauses and sentences fronted by main clauses.

DEDICATION

Dedicated to anyone who has ever had difficulty reading.

ACKNOWLEDGMENTS

Many thanks to my chair, Dr. Elly van Gelderen, for her invaluable guidance, understanding, and patience. I could not have had a better academic mentor to steer me through the process of compiling everything that was needed to complete the thesis! Additionally, I would also like to thank to Dr. Kathryn Pruitt for her time and knowledgeable assistance with the statistical side of this research project, and to Dr. Mark James for his excellent suggestions on how to proceed in the early planning stages of this thesis. Furthermore, I thank Daniel Coven for all the statistics tutoring he provided, and to the staff at the Disability Resource Center for everything they did to help me coordinate this project. I offer a final word of thanks to my family and friends for their unwavering support.

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CHAPTER 1

INTRODUCTION

When a student enrolls in a college level course, they inevitably rent or purchase a textbook as a supplement to classroom lectures. Since textbooks are commonly used in teaching courses, they are an excellent example of what occurs linguistically within the academic register. While writing styles may differ because of textbook authorship, unofficial guidelines for writing in an academic register will generally still be followed. Because of this, similar syntactic structures of sentences frequently occur in this register. These sentences are often complex and have many clauses to convey ideas and concepts to the reader.

Sentences that have several supporting clauses and phrase structures surrounding a main clause are commonly found in many registers of writing. According to Hawkins' (1994) research concerning the hierarchy of constituency, the human brain can process the meaning of a sentence more quickly when a main clause has been positioned to appear before any additional clause structures appearing in a sentence (p.57-65); in other words, additional clauses that are not part of the main clause structure are suggested to become easier for the brain to process if they appear at the back of a sentence (presumably, also after a main clause). While Hawkins' (1994) research focused on the constituency and ordering of main clauses and prepositional phrases, the study in this master's thesis aimed to test the theory of constituency and its relevance with temporal adverbial clause structures.

Temporal adverbial clauses can be found easily in academic writing. In grammar, the term adverbial clause can be defined as a subordinate that amplifies the information presented in the main clause (Verstraete, 2007, p.102). The temporal adverbial clause is a clause that provides additional, supporting information to the main clause, but also offers a degree of temporality in which the reader connects to the meaning of the sentence. Moreover, this study was designed to evaluate how temporal adverbial clauses affect sentence processing times for readers who have and have not been diagnosed with dyslexia.

This study was originally proposed as an end of term final project in a linguistics research methods course. Initially, the methodology of this proposal took font style and other syntactic aspects into consideration. While there are many relevant aspects about what readers see before sentence comprehension occurs, these were not included in the present study. For this thesis, the study was narrowed to focus solely on temporal adverbial clauses. Additionally, the structure of the chapters in this thesis were loosely inspired by suggestions made to linguistics students in Paltridge and Phakiti's *Research Methods in Applied Linguistics* textbook (2015, p.272-273).

CHAPTER 2

LITERATURE REVIEW

Due to the nature of this study, several disciplines were drawn from in the following literature review. While this thesis has been written primarily from a linguistic perspective, the other disciplines provide essential information that is relevant to an experimental study that focused on dyslexia. I start my literature review by addressing literature originally referenced in the research proposal written for this thesis (Claire, 2016). While some of the content from this initial literature review is no longer applicable to this study, there are still several papers that were mentioned which contributed to the foundation of the experimental design (Claire, 2016). Therefore, these papers are essential to my literature review in this thesis.

Tops, et al. (2012) conducted a study that analyzed phonological processing errors of college students who had dyslexia (189, 198-99). The Tops, et al. research yielded results that provided evidence that dyslexics have lifelong experiences with phonological processing errors (p.198-99). It is because of results such as this that there is a need for studies that focus on language processing and dyslexia. For the sake of keeping the subject matter of my thesis focused on the processing of temporal adverbial clauses, I did not implement any ways to assess phonological processing errors in my research design; however, it could be worthwhile to rework the concept of this thesis so that it could focus on phonological processing errors in future research.

In 2013, Cantiani, et al. created an experimental study that analyzed the reading times of participants who had reading disabilities (1135, 1152, 1140). Specifically,

Cantiani, et al. (2013) were measuring morphosyntax processing (1135, 1152). While the current study does not focus directly on a subject as broad as morphosyntactic processing, the experimental design of the Cantiani, el al. (2013) research became a loose model for the approach taken to developing a research design for this thesis. It is with these experimental research designs that there lies the potential to uncover new information about reading disabilities. Some studies have considered the font styles presented to participants in texts. An example of this would be in Rello & Baeza-Yates' (2016) study. This study determined that font styles, such as "Arial," "Verdana," and "Helvetica" are preferred by those who have been diagnosed with dyslexia (2016, p.28). To maintain focus on the central topic of temporal adverbial clauses, font style was not factored into the research as a variable.

LINGUISTICS

As mentioned by Diessel (1996), an adverbial clause can occur before or after a main clause (p.71). When considering the words that front temporal adverbial clauses, the word ‘when’ is commonly found (Diessel, 1996, p.71). What sets the word ‘when’ apart from other words that indicate the temporality of a clause (e.g. ‘as,’ before,’ ‘until,’ etc.) is that it appears more frequently across many registers of writing (Diessel, 1996, p.71). Diessel (1996) presents the notion that there is a correlation between temporal adverbial clauses and Hawkins’ (1994) research about Early Immediate Constituents (p.78). Early Immediate Constituents is a theory that deals with sentence complexity, the syntactic ordering of that sentence, and how easily the sentence is processed by a reader (Diessel, 1996, p.79). Diessel suggests that sentences which have a main clause appearing before a temporal adverbial clause should be simpler to read than sentences which are fronted by a temporal adverbial clause (p.79).

Hawkins’ (1994) book titled *A Performance Theory of Order and Constituency* provides more depth to the topic of Early Immediate Constituency. Hawkins theorized that sentences which had supplemental clauses appearing before the main clause of a sentence would be simpler for a reader to recognize (p.57-58). An example of what this would look like with temporal adverbial clauses follows:

Figure 1: Adverbial Clause before Main Clause

CP[When I go to the store, TP[I buy ice.]]

1 2 3 4 5 6 7

|____|_|__|__|____|_____|

Figure 2: Adverbial Clause after Main Clause

TP[I buy ice CP[when I go to the store]]

1 2 3 4

|__|____|_____|

(Adapted from Hawkins, 1994, p.57)

As shown in the above sentences, there is a difference in the amount of steps a reader must take before being able to recognize what the main clause of the sentence was intended to be; in the first sentence, several steps must be taken before the reader has a sense of what the main clause of the sentence will be; in the second sentence, the reader immediately knows what the main clause of the sentence is and is able to process the subsequent temporal adverbial clause.

DYSLEXIA & THE BRAIN

Even if a layperson has not done extensive research on the topic of dyslexia, they are still likely to have a fundamental understanding of the style of language processing that occurs with the disorder. What a layperson may not know is that there are several ways of classifying the forms of dyslexia that researchers have documented and observed in years of study. One of the prominent sub-classifications is called developmental dyslexia. *The International Encyclopedia of the Social and Behavioral Sciences* defines this as a difference in the way the brain processes phonology (Gosowami, 2015, p.728-729). Those with developmental dyslexia have difficulty processing phonological aspects of language at the same speed as those who have not been diagnosed with dyslexia (Gosowami, 2015, p.728). Forms of acquired dyslexia are typically the result of a brain injury, but it is also possible for degenerative brain conditions to cause a person to acquire dyslexia when they did not previously have it (Allen & Whitaker, 2015, p.733).

According to Moats & Dakin (2008), one-fifth of the population has a reading disability and another one-fifth of the population has a degree of reading difficulty (p.30). This means that there are many students who are reading textbooks who have not officially received any form of a diagnosis for dyslexia, but still exhibit the same signs of reading difficulty associated with it. This percentage is also represented by Yale's Center for Dyslexia and Creativity by 20% of the population (2017), which is just another representation of that one-fifth. It is also noted by Yale's Center for Dyslexia that the disorder is quite common within populations of people who have learning disorders, and it accounts for 80-90% of learning disorder diagnoses (2017).

Cognitive research has forwarded studies associated with dyslexia by drawing attention to the areas of the brain that are linked with the reading disorder. People who do not have a reading disorder will typically have a left brain hemisphere (otherwise known as the cerebral cortex) that processes language easily (Moats & Dakin, 2008, p.46-47). These areas of the brain associated with language processing are known as Broca's Area and Wernicke's Area (Reid, 2008, p.12). However, in instances where someone has a reading disorder and the regions of the brain associated with language processing are not functioning at a typical level, the right hemisphere of the brain may activate (which is atypical for most people) in an attempt to compensate for the under activity in Broca and Wernicke's Areas (Moats & Daikn, 2008, p.46-47). What further complicates this for people who have the disorder and for researchers trying to understand more about the disorder is that dyslexia does not occur in the same manner in any two people; furthermore, this can become even more complex due to the fact that someone's degree of dyslexia can change over their lifetime (Moats & Daikin, 2008, p.9).

Currently medical professionals do not have a singular way of defining what is and is not dyslexia (Moats & Daikin, 2008, p.2,6). This is strong evidence that there are still aspects of dyslexia that require more research.

CHAPTER 3

METHODOLOGY

The methodology of this research was developed to be an experimental mixed-methods research model. This research qualifies as experimental because it incorporated processes that occurred in several sources of literature and reapplied applied them to fit the scope of the topic of this thesis. This study was conducted using a self-paced reading task. Self-paced reading tasks have been used by psycholinguists since the 1970s; it is used in instances where eye-tracking is not possible or does not fit the scope of what is being studied (Jegerski, p.20). Since this thesis was only covering a small aspect of language processing, self-paced reading was chosen as the preferred method of measuring comprehension over eye-tracking.

The hypothesis of this thesis was based on Hawkins' theory of Early Constituency. Hawkins theorizes that a sentence becomes easier to process when the main clause appears before additional information (1994, p.57-65). Therefore, I hypothesized that temporal adverbial clauses that appear in sentences after the main clause would be easier to read than sentences fronted by temporal adverbial clauses, and would especially be true for students who had been diagnosed with dyslexia.

PARTICIPANTS & ETHICS

There were eight total participants recruited for this study. All participants who took part in this study were over the age of 18 and were currently enrolled students at the large southwestern university where the research took place. Both undergraduate and graduate students were eligible for participation. Four participants represented the control group; these were students who had not been diagnosed with dyslexia. The remaining four participants represented the experimental group; these were students who had been diagnosed with dyslexia. Participants were each given a $15.00 Target gift card as compensation for their time.

Before the study occurred, participants were presented with an IRB-approved social behavioral consent form. On the consent form, the study was titled "Dyslexia and the readability of college-level textbooks." This title accurately described the research without drawing attention to the temporal adverbial clauses embedded in each of the sentence items. After the study's completion, participants were then presented with a debriefing document so that they could understand that the objective of the study was to measure the effect temporal adverbial clause positioning might have on the readability of a sentence.

The two groups of participants were recruited in different ways; non-dyslexic participants were invited via email or through an in-person presentation of the study; dyslexic participants were recruited with the aid of the Disability Resource Center. Staff at the Disability Resource Center forwarded an email with recruitment information to students who would be eligible for participation on my behalf. Those interested in

participation then contacted me by email or by phone to arrange a time. The participants were each presented with a consent form that described the purpose of the study, what would happen to the data collected, and who to reach out to if they had any questions or concerns regarding the study.

Participants were asked to complete a background survey before the self-paced reading task began. There was no personally identifiable information gathered in this survey. Participants were asked to provide their age, whether or not they were undergraduate or graduate students, and indicate if they had been diagnosed with dyslexia. There were also questions that gave participants the chance to self-report on the difficulty of academic texts.

RESEARCH DESIGN

Before this survey was created, psychology standards for research that invited others to participate was reviewed for proper protocol, incorporation, and design (Jackson, 2012, p.92-93). The Likert Scale was a recommended item to be included on a survey as a means of allowing participants to self-report most accurately (Jackson, 2012, p.92-93).

The present study can be classified as experimental mixed-methods research. I obtained a used laptop from a large southwestern university's surplus facility. The model of the laptop was a Dell Latitude D630 from 2007 that was in good condition. I opted to install Linger on the Latitude D630 laptop instead of a desktop computer because of its mobility and convenience. Linger was a recommended choice for self-paced reading software in a psycholinguistics research methods textbook because it is a free software to run and is practical for student research (Jegerski, p.43). In the initial stages of planning for this study, I considered having several lab spaces available to participants for meetings and allowing the participant to choose the location; however, after more thought on this matter, I decided to only use one lab space.

After installing Linger, I coded my items with the appropriate script that the program uses. Linger runs with a free external application called Tlc/Tk that must be present on the computer running the experiment. Once items have been coded and all of the experiment program commands have been set, Linger turns the coding into a self-paced reading task that gathers reading times and item comprehension questions. For my experiment, I had participants read two variables of six sentences from a linguistics grammar textbook. These sentences were specifically chosen for temporal adverbial

clauses that were not dependent on word ordering; these temporal adverbial clauses could appear before or after the main clause of the sentence. From the six original sentences, there was an additional sentence item created by reversing the order of how clauses appeared in the sentence. In total, there were 12 items for participants to read in the reading task.

EXPERIMENT

Participants were individually invited to a lab space at the large southwestern university. An IRB consent form was presented to each participant before the experiment began. All who participated were given the opportunity to keep a copy of the consent form for themselves. The participants who had opted to respond to the research participation invitation through email were sent a digital copy of this document; all other participants who opted for other means of communication were presented with a hard copy of the form. Next, each participant was given a $15.00 Target gift card, and a background information survey was then administered. When the survey was completed, participants were invited to begin the self-paced reading task. The instruction and practice segments of the self-paced reading task gave participants an opportunity to ask for clarification about Linger's processes. When participants had full understanding of Linger's processes, they proceeded onward to the 12 items from the experiment. The 12 items were randomized by Linger and appeared in a different order for each participant. The items were also divided into two segments with 6 items in each segment and a break between the two. On average, participants took about 15 to 20 minutes to finish the self-paced reading task. Upon completion, the results were automatically stored by the Linger program in a result folder.

Although Linger had a built-in data analysis program called Linganalyzer, the program was not used in this study. Instead, the data files from the experiment automatically saved as DAT files and were then converted to comma separated value

files so that they could be opened with Microsoft Excel. Excel spreadsheet data was then imported to SPSS, where data measurements were calculated.

CHAPTER 4

RESULTS

This chapter is dedicated to the statistical results of the experiment. Firstly, the results from the survey administered to participants are discussed. The data from the self-paced reading task is then reported in the subsequent section. This section contains three tables that feature statistical measures. Finally, the comprehension questions that were included with each sentence item are also discussed.

SURVEY RESULTS

The first half of the research survey featured preliminary questions that were asked in order to determine participation eligibility. These questions inquired about the participants' age and the participants' status as a student. All participants were between age 19-45, and all participants were either undergraduate or graduate students. Next, a question was presented about whether or not the participant had been diagnosed with dyslexia. Four of the participants self-reported that they had dyslexia, and four participants self-reported they did not have dyslexia. Following this, additional questions about challenges experienced with academic texts were presented. Participants who had self-reported dyslexia were asked about accessibility software, such as Kurzweil. Only one participant in this group self-reported utilizing such software. Additionally, participants who self-reported that they did not have dyslexia were presented with a question that inquired about the circumstances of when they felt like they experienced challenges reading academic texts (if at all). Participants in this group self-reported an infrequency of experiencing challenges with reading academic texts. Finally, all participants were asked to rate the challenges experienced while reading academic texts from one to five: the number one represented no challenges, two represented some challenges, three represented a neutral response, four represented noticeable challenges, and five represented extreme challenges. Participants in the dyslexic group self-reported experiencing challenges associated with the numbers four and five; participants in the non-dyslexic group self-reported experiencing challenges associated with numbers one and two.

SELF-PACED READING TASK RESULTS

As mentioned previously, Linger measured elapsed time spent on each individual word in milliseconds. After all data was collected from participants, the measurements from the relevant sentences were fully collected and entered into an Excel table. Excel calculated the amount of time it took each participant to read the temporal adverbial clause, the main clause, and the total duration of the entire sentence. These numbers were again migrated to another Excel table in preparation for being run through SPSS for statistical analysis.

SPSS Version 24 was used for the statistical calculations in this study. T-tests were used for calculations rather than ANOVA because they were most appropriate for the amount of data collected for this study. The T-tests evaluated whether or not there was an equality of variance present in the data. In order to do this, SPSS ran Levene's Test as a means of sorting statistical significance.

Table 1: Rt Per Word Across Full Sentence

		Dyslexic (N=24*)	Control (N=24*)	Difference	*df*	*t*	*p*
AC before	M (SD)	637ms (206)	603ms (181)	33	46	0.594	0.555
AC after	M (SD)	645ms (213)	539ms (134)	106	46	2.054	0.046

M=Mean; SD=Standard Deviation; df = Degrees of Freedom; t=T-Statistic; p=Significance

There was not a significant difference between dyslexic and control groups for full sentence measurements when the adverbial clause appeared before the main clause, $t(46) = 0.594$, $p = 0.555$. The difference between the dyslexic and control group for this

measurement was 33, an indication that both groups' average reading time per word trended similarly when this syntactic organization was presented in a sentence item. Full sentence measurements with an adverbial clause that appeared after the main clause had a significant difference, $t(46) = 2.054$, $p = 0.046$. The dyslexic and control groups had a difference of 106 for this measurement. The average reading time per word was greater for the dyslexic group than the control group.

Full sentence items that were adverbial clause fronted sentences produced a result that was not projected. It was hypothesized that adverbial clauses which appeared before the main clause would elongate reading times due to the theory of Early Immediate Constituency, presented by Hawkins (1994). The theory applied to the control group, but not the dyslexic group. The statistical significance in full sentence measurements indicated a further analysis of the data was required. Full sentence results were divided into main clause measurements and adverbial clause measurements.

Table 2: RT Per Word Within MC

		Dyslexic (N=24*)	Control (N=24*)	Difference	*df*	*t*	*p*
AC before	M (SD)	636ms (206)	603ms (187)	33	46	0.573	0.569
AC after	M (SD)	626ms (216)	532ms (132)	94	46	1.817	0.076

Table 2 displays the average reading time per word within the main clause of the sentence items. Main clause items appearing in adverbial clause fronted sentences did not have a statistical difference, $t(46) = 0.573$, $p = 0.569$. The difference between the average reading time per word for each group was 33 milliseconds. This measurement of the main clause in adverbial clause fronted sentences produced a similar result in Table 1.

Sentence items that began with a main clause also had no significant difference, t(46) = 1.817, p = 0.076. The difference between the average reading time per word for each group in main clauses that appeared at the beginning of a sentence was 94 milliseconds.

Table 2 results indicate that the main clause was not the clause within the sentence items which was responsible for the statistical significance found in Table 1; instead, it was the adverbial clause that produced this result. Nevertheless, the average reading time per word for main clause fronted sentences (or, AC after) has presented a finding that has a connection to the theory of Early Immediate Constituency (Hawkins, 1994). The Dyslexic group's average reading time per word of the main clause decreased in milliseconds when the main clause was at the beginning of the sentence. This was also true for the Control group, but there was a greater decrease in reading time for the AC after measurement than for the Dyslexic group.

Table 3: RT Per Word Within AC

		Dyslexic (N=24*)	Control (N=24*)	Difference	*df*	*t*	*p*
AC before	M (SD)	652ms (275)	613ms (198)	39	46	0.562	0.577
AC after	M (SD)	701ms (254)	557ms (167)	144	46	2.323	0.025

Results from the dyslexic and control groups from sentence items fronted by adverbial clauses contained no significant difference, t(46) = 0.562, p = 0.577. The difference between the average reading time per word for each group was 39 milliseconds. Results from sentence items that contained adverbial clauses arranged to appear after the main clause had a significant difference, t(46) = 2.323, p = 0.025. For this measurement, the difference between the two groups' average reading time per word

was 144 milliseconds. The Control group's average reading time per word decreased when the temporal adverbial clause appeared at the end of the sentence. In contrast to this, the Dyslexic group's average reading time per word increased for the AC after measurement.

Hawkins (1994) hypothesized that a central thought appearing before any other additional clauses in the sentence would allow for the reader to process a sentence more easily (p.57-58). Control group results appeared to reflect what was hypothesized in the theory of Early Immediate Constituency, while the Dyslexic group did not. This suggests that the language processing centers of the brain are unaffected by altered syntax that follows the Early Immediate Constituency theory if a reading disorder is present.

Figure 3: Temporal Adverbial Clause & Main Clause Measures

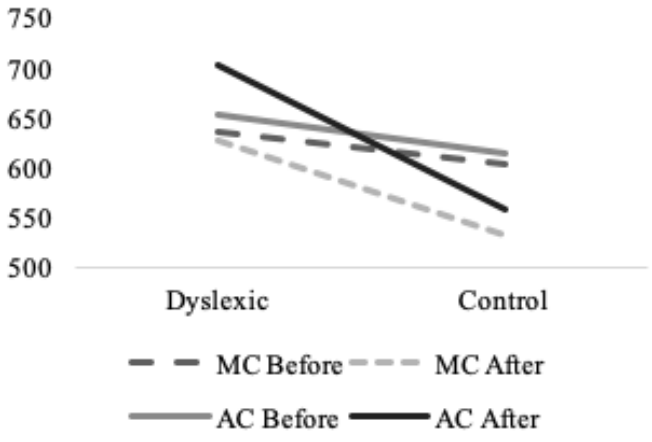

Figure 3 shows a consolidated interpretation of the data discussed in Tables 2 and 3. The number line on the y axis begins at 500 milliseconds instead of 0 milliseconds due to the range of total collected measurements being between 532 milliseconds and 701 milliseconds.

COMPREHENSION QUESTIONS

Each sentence item was followed by a comprehension question during the experiment. There were two types of comprehension questions: questions that rephrased the information presented in the sentence item, and questions that were completely unrelated to the sentence item. All comprehension questions were formatted to be yes-no response-yielding questions. The amount of time participants spent answering questions was also measured.

Comprehension questions were added to the end of each sentence item in order to measure whether or not there was a preferred syntax for sentences that contained a temporal adverbial clause. The chart below contains results from this aspect of the experiment.

Table 4: Comprehension Question Responses & RT

	AC before 1	AC before 0	AC After 1	AC After 0	AC Before RT	AC After RT
Dyslexic	0.71%	0.29%	0.71%	0.29%	5.38s	5.44s
Control	0.75%	0.25%	0.79%	0.21%	3.67s	3.43s

RT = Reaction Time, 1 = Answered Correctly, 0 = Answered Incorrectly

Both groups shared comparable results for the percentage of questions answered correctly and the percentage of questions answered incorrectly. Reaction times were represented in seconds in this chart. The dyslexic group had an average reaction time that was two seconds longer than the average reaction time of the control group.

CHAPTER 5

CONCLUSION

While the results of this study have given evidence that clause structuring does affect the way someone reads a sentence, the data is only a step toward a conclusive answer to the hypothesis. It is possible to come to two different conclusions with the results; the first being that sentences which have a temporal adverbial clause appearing before the main clause are the most suitable structuring for a textbook. The justification for this perspective is that the participants, in their respective groups, had reading times that were more similar than when reading the opposite sentence constructions. This would signify that people with and without dyslexia might read these types of sentences in textbooks at most similar rates of time. Nevertheless, this does not consider sentence comprehension. It is too early to make this claim without testing sentence comprehension further. From another perspective, the results could be viewed through a lens that indicates participants taking longer to read sentences that are arranged with the temporal adverbial clause appearing after the main clause because their sentence comprehension was higher than in the opposite arrangement. The sentence comprehension questions the participants were shown did not contain any conclusive data to make a strong statement about which sentence arrangement provided the most readable sentence. The purpose of this study was ultimately to measure reading time, so the results, although not answering the research question absolutely, have proven that it is worth looking at clause structuring of sentences in textbooks.

Should further research on this topic be conducted, a different methodology would need to be devised. Self-paced reading may not be the most suitable application

for further research on the topic. Quantitative data provided evidence of a significant difference between the control and dyslexic participant groups; however, for sentence comprehension, which is subjective, it may be that a qualitative research approach would be more suitable.

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APPENDIX A

IRB EXEMPTION FORM

ASU Knowledge Enterprise Development

EXEMPTION GRANTED

Elly Van Gelderen
English
480/965-3535
ellyvangelderen@asu.edu

Dear Elly Van Gelderen:

On 10/26/2017 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	The positioning of temporal adverbial clauses in sentences and the effect this positioning has on dyslexia
Investigator:	Elly Van Gelderen
IRB ID:	STUDY00007259
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Sentence Items, Category: Participant materials (specific directions for them); • HRP-503a - Protocol Template Social Behavioral, Category: IRB Protocol; • Survey Questions, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Email Invitation, Category: Recruitment Materials; • Participant Instructions, Category: Participant materials (specific directions for them); • Debriefing , Category: Recruitment Materials; • HRP-502a - Consent Document Social Behavioral, Category: Consent Form;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 10/26/2017.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Jordan Claire
Jordan Claire
Elly Van Gelderen