The Effects of Cardio-Syntactic Analysis Instruction on Writing Scores in a 11th Grade High

School Classroom

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Abstract

The purpose of this research was to determine the effects of Cardio-Syntactic Analysis instruction on writing scores in an 11th grade English class. The sample consisted of 35 students enrolled in an Honor's English 11 class at Volunteer high School, in Church Hill, TN. The class was randomly assigned into an experimental group of 17 students and a control group of 18 students. The students in the experimental group participated in two days of intensive study of Cardio-Syntactic Analysis. Meanwhile, the control group worked on a game project that was due at a later date. The control group was not in the classroom during the instruction. After the instruction, both experimental and control groups were given a prompt, and 80 minutes to complete a well-formulated essay. Data were collected using a rubric to quantitatively score the essay. The rubric consisted of several categories. Data were then analyzed using t-test for independent means. The results indicated a significant difference between the experimental and control group for their performance. The experimental group outperformed the control group in the overall scores; similarly, they outperformed in the instructional categories taught within Cardio-Syntactic Analysis. The findings of the study suggest that secondary students could benefit from Cardio-Syntactic Analysis instruction in their English classes.

Review of the Literature

Sentence combining techniques have been discussed for years; moreover, there are arguments on both sides of the issue with respect to the value of sentence combining instruction in the classroom. On one side of the issue there is John Mellon and Frank O'Hare, who in their 1969 and 1973 studies of syntactic analysis showed that a higher usage of syntax leads to more fluency and maturity in writing (Combs, 1976). Conversely, educational guru, Robert Marzano is on the other side of the issue stating that sentence combining education, and its effect on writing maturity is a myth. Interestingly however, even Robert Marzano admits, in his rebuttal of Mellon and O'Hare's research, that there is some evidence that "practice in sentence combining probably does improve overall composition quality," (Marzano, 1976, p. 58) but, he says that it is only to a limited extent (Marzano, 1976). This being said, what is the efficacy of sentence combining strategies, and at what level can they most effectively be taught?

It is important to look at writing as a wholistic practice. Sentence combining strategies can be looked upon as the culmination of such practice. In order to better understand what parts are involved in writing, it is important to look at the taught and learned components that lead up to the educationally conceptualized acceptance of excellence in writing.

Writing is an art, and therefore, must be practiced. In so much as this practice is self-fulfilling, there are generally accepted concepts of what items must be present in order to satisfy the basic tenants of excellence in the writing arts. This review of the literature covers four primary topics of relevance to this thesis. Primarily, the question is what is meant by sentence combining strategies. In order to get to that point, however, the concepts of grammar, mechanics, syntax, and finally, sentence-combining must be thoroughly vetted in order to see how it is that

sentence combining strategies may be considered the culminating study of writing maturity. In the literature, there are many discussions of all of these components.

The literature encompasses all age groups of individuals. There are some studies on grade school students all the way through post-graduate students. What this illustrates is that writing is a skill that deserves the attention to detail, because the skill is rarely masterfully achieved. Writing is fluid science. It has rules, but those rules encompass many different avenues of exploration.

Grammar Instruction

Grammar is often criticized, by criticizing the grammarian himself. When one hears of someone who is a critic of someone's grammar, he is often referred to as a "Grammar Nazi." This is such a pejorative term for someone who is merely trying to ascertain effective meaning of symbolic linguistic representation. Grammar is the cornerstone on which any society builds communication. If the grammar is not effective, and the assumptions of the writing are therefore muddled, the control of the meaning is relinquished from the writer to the reader (Leahy, 2005). Is this the desired effect? Although, many would agree that the control of the meaning should stay with the writer, they would continue to argue against formal grammar instruction.

The National Council of Teachers of English in 2003 criticizes the teaching of grammar in isolation. This may seem innocuous in some ways because of the overarching concept that nothing in writing should be taught in isolation. However, the fact that it came from a prominent organization has inadvertently lead to teachers and professors being discouraged from teaching grammar altogether (Leahy, 2005). This lack of teaching all the way through the college ranks has a multiplicative effect on the teaching of grammar moving forward.

If future generations of teachers are not taught the cornerstone of communication, there will be a dearth of confidence in teachers and professors for the future generations. This will lead to a breakdown of linguistic structure and ability, therefore, to communicate effectively in society. Anne Leahy sums up this idea so well in her 2005 article by stating that without the foundational knowledge of grammar,

> Your sentences are likely not to be as luminous and complex as the ideas and feelings you are trying to convey, and isn't it a shame when grammar and syntax are there to embody and enliven your ideas, to convince me of their brilliance? (p. 306)

In a discussion of sentence combining strategies, grammar remains the cornerstone of the building of a writer's architecture. Without that cornerstone, there can be no further work on the building. Without this cornerstone, there would be no understanding of corrections for such mistakes as subject-verb agreement, or antecedent pronoun errors.

Subject-verb agreement is the bane of existence for many writers and teachers alike. Often, these mistakes occur when there is a prepositional phrase separating the subject and the verb. In student writing, confusion occurs because they may choose for the verb to agree with the proximal subject in the prepositional phrase as opposed to the true subject of the sentence (Behrens, 2011). If only that were the end of the problematic grammar, then maybe grammar would not be so demonized. However, antecedent pronoun errors are as prevalent as any grammatical mistake.

The main reason antecedent pronoun errors exist is, in great part, due to the English pronoun system being in a constant state of flux (Behrens. 2011). The most common culprit of this is the third person plural pronoun. "They", or variances thereof, is often hard to avoid in

writing. There is much discussion on how to effectively write a sentence with gender non-specificity. That is the underlying issue. In a sentence such as, "a teen interested in reading the newest fiction should go to their nearest bookstore," what gender do you use? According to Susan Behrens (2011), more attention must be paid to the connections between the constituents. In other words, the antecedent should be gender specific, so that the pronoun can be equally specific.

There are many other grammar errors in the realm of grammar struggles; but the approaches of the teacher must continue to attempt to limit the grammar mistakes within a construct that is greater than grammar itself. If we in the educational community only look at the grammar, we will be missing the forest of possibilities for our students. Grammar affects the ability for a writer to reach the maturity that Mellon and O'Hare discussed in their research. What the literature represents is that there must be a concerted effort to incorporate grammar into the overall approach to writing (Leahy, 2005).

Mechanics Instruction

The English language often is said to parse words and meanings. This can be evidenced in a discussion of grammar and mechanics. Often, the two concepts are interchangeably utilized in study. However, there are distinct and important differences. Grammar deals with the parts of speech and their functions and order; conversely, the term mechanics refers more to the conventions of a given written language. In other words, mechanics, unlike grammar, deals with issues such as punctuation, spelling, and capitalization.

In research by Murray Stewart and Cary Grobe (1979), the relationship between syntactic maturity and skill in mechanics of writing was studied. Specifically, this was related to the

quality ratings given by teachers. When discussing mechanics in writing, the quality grading is often the underlying focus. Because mechanics is not the governing rules, but more the overall "feel" and perceived excellence of the work, mechanics and grade are forever linked. That being said, mechanics is extremely important, because, after all, the reader is the ultimate judge of writing. The Stewart, Grobe study indicated that the mechanics of the writer influenced the grade significantly. Specifically, the length of the composition and the lack of simple spelling and punctuation errors were directly influential on the grade of the paper (Stewart, 1979). Punctuation errors are most commonly seen in such writing maladies as run-on sentences and sentence fragments. Both of which can be remedied by the proper use of punctuation.

Punctuation, such as commas and periods are learned by students almost by intuition (Behrens, 2011). The problem with this is that the "intuitive" rules are not really the rules in the mechanics of the English language. A student may put a comma in place because it sounds right when read out loud. Unfortunately, that measurement of accuracy is not what needs to be used. The rule lies within the mechanics of the language. What must be taught, therefore, is the grammatical idea of the clause in its independent and dependent form; In addition, the mechanical idea of separation of such by punctuation must be introduced. The need for instruction in the mechanics of the comma is evident. The student may intuitively put a comma between two independent clauses and inadvertently create a run-on sentence due to a comma splice. Or, the student may combine two independent clauses with a transition word that they use as a conjunction. Both of these mechanics problems can be, and should be, used as teachable moments to enhance the syntactic ability of the students, and move them forward towards sentence-combining strategies (Behrens, 2011).

One such mechanical device that should be introduced when using the run-on as a teachable moment is the semi-colon. A semi-colon can be used to create more complex sentences. After all, as educators we are striving to enhance the writing ability and the communication effectiveness of our students. Elizabeth Oliver (2014) sums it up well in discussing her struggles teaching tenth grade writing classes.

> But what I am seeing is that I should perhaps broaden my inquiry to include syntax as a precursor to style, composition and mechanics, thus hitting all three areas scored on standardized essays. If students are to use complex syntax, they need to have the mechanic usage to make it work. (p. 63)

Elizabeth Oliver is a stalwart in the fight to create an educational system for English Language Arts (ELA) that is both effective and comprehensive.

Syntax Instruction

As mentioned in the previous sections on grammar and mechanics, it is coming to a point where grammar instruction is taboo in the American educational society. If grammar is taught directly, the teacher is considered a "Nazi," or anachronistic. How then can a teacher teach the importance of the subject without overtly calling it grammar or mechanics? One such way is to incorporate it into the instruction of syntax. We as teachers can teach diagramming sentences all day long, and we can point to the successes that it produces. However, that is a time consuming and merely a partially effective way of teaching writing (Oliver, 2014). Syntax can be imitated; and in literature there is a plethora of great writers to imitate? Not only can we imitate fiction, but we can imitate all genres of writing. There are fantastic columnists around the country; there are amazing biographers and autobiographers who right with style and panache. If students want

to imitate excellence, they can find excellence. Educators must be willing to allow the exploration of these writers.

Oliver, in her 2014 article, so aptly states this plethora of imitation possibilities as her "arsenal of patterns." Moreover, each student can study the syntax of authors and come away with individually differentiated toolboxes of patterns. Syntax, as defined by Constance Hale (1999), "is the underlying codes that give prose its clarities yet fail to explain its beauties" (p. xv) Therefore, the study of syntax as an overarching method can be used for all levels of writers. One part of the toolbox that must be discussed is that of word choice and repetition.

In a 1978 study, performed by Ann Gebhard, of Syracuse University, it was evident that even though professional writers begin one in every ten sentences with a transition word or coordinating conjunction such as but, so, or yet, college freshman writers did not follow suit. This lends credence to Oliver's claim that we must give our high school students more access to professional authors to increase syntactic imitation. So, educators, especially in the high school setting, need to prepare students for the college level writing by providing them with a syntactical basis for which to use in their own writing. Many educators would think this would be impossible to achieve if the foundations have not been laid by the previous instructors. These foundations of which they would argue would be grammar, style, and mechanics.

In order to have proper syntax, would it not be obvious that grammar, style and mechanics would be included? Thus, would it not make sense that syntax be the precursor to those subjects? The goal of English language education should be to imbue the students with their own set of tools to appear credible in an ever increasing world of competition. Consequently, they must be versed in correct usage, grammar, and mechanics. By using a

syntactic approach that engages the students in thinking about the grammar and usage, while, at the same equips them with the models of writing, achieves that goal (Oliver, 2014). Although Oliver studied high school students, there have been other studies that show that syntax instruction can, and should, be started at a much earlier age.

Enola Borgh studied elementary students in 1965. She presents syntax as a form of "basic patterns". Borgh refutes the idea of starting with parts of speech as the starting point; she points out the fallacy in believing that being able to spot-check each word and give it a name does not improve skills in writing or reading. Her contentions go back to the idea that children have an intuitive understanding of the language; and she states that "the teacher's role is to bring to the conscious level something which children can do intuitively" (Borgh, 1965, p. 31). She concludes by pointing out that the syntax and structure to which the young reader has been exposed, allows the student to not only imitate what has been read, but go beyond and enhance the vocabulary he has acquired. This, in and of itself grandly illustrates the importance of syntax instruction at an early age.

In 2011, Scott Beers and William Nagy performed a study that looked at writing development and syntactic complexity. They point out that most children acquire basic syntactic structures of oral language before they reach the age of four. They question how we can then transfer that basic knowledge of oral syntax to writing. Beers and Nagy correctly add that students must be able to read and write in a variety of genres to succeed in school (Beers, 2011). How they acquire this syntactic ability goes back to the ideas of Oliver. They must be avid readers of quality literature, both fiction and non-fiction in order to imitate excellence.

Looking at the two studies, one in 1965 and one in 2010, one can surmise that there is some validity to the idea that, from a young age, syntax is an important and necessary instructional topic for improved writing technique. Moreover, it can encompass the rules and formality of grammar and mechanics without instruction being mundane (Berninger, 2010).

Sentence Combining Instruction

Sentence combining, although popularized in the 1960s, started with the generative-transformational theory of grammar brought out by Noam Chomsky. Specifically, Chomsky's hypothesis of the two levels of language, surface structure and deep structure led others to coin the phrase, sentence-combining transformations (Neville, 1985). This then led to the 1960's research, where the concept picked up momentum in educational circles.

Early in the 1960s, sentence combining instruction became popular. What the researchers were missing, however, was a way to analyze the syntactic complexity of large samples of writing. This led to the T-unit. The T-unit was developed by Kellogg Hunt in 1965. This T-unit was able to show that as schoolchildren become older, and the complexity of their syntax increases, the mean T-unit length of their compositions increase as well. This increase is due to the grammatical and mechanical constructs of such items as prepositional phrases, adjectives, and other subordinate clauses (Cooper, 1981). So, now that there was a device for measurement, what outcomes were discovered?

Hunt was able to show that syntactic maturity was reached over a student's time in school. He showed that a high school senior is able to effectively manipulate a single sentence to express the same information that would take a younger student multiple sentences. In addition to this, the variety of which an older student can convey a message in an essay or writing

assignment increases as the student gains a larger repertoire of syntactic tools from which to pull (Cooper, 1981). In other words, syntactic fluency will increase.

This fluency cannot be expected over night. If the student engages in sentence combining instruction and practice over the course of their schooling, then, and only then, can there be a substantial T-score obtained. For example, in a study by O'Hare, after instruction and practice, small gains in T-score were obtained in the 4th grade; however, gains of 5 words per T-unit were gained after the 7th grade (Crowhurst, 1983). These may seem small, but remember these are sentences we are comparing. The addition of five words is a big jump, and shows a large increase in syntactic fluency. There are some caveats to this gain.

The gains reported also showed that the sustainability of the gains is limited to usage of the fluency over time. Therefore, it is safe to assume that gains in syntactic fluency can reduce given time away from the practice of the skill. But, the skill is still evident when and where the person wants to employ the previously learned techniques (Crowhurst, 1983). So, all is not lost. Sentence combining skills may not be as easy as remembering how to ride a bike, but they are possible to recall when needed. These skills are not only useful for making short sentences longer, but also for the opposite.

Effective writing is about "manipulating and rewriting basic or kernel sentences into forms that are more syntactically mature and varied (Saddler, 2010). This is one way of looking at it, and is the most commonly practiced method. However, there is an equally important characteristic of sentence combining, which could be termed sentence deconstruction. Notice that Saddler commented on a sentence being varied. As much as it is important for a writer to not have a lot of short sentences, it is equally important for them not to have a plethora of long,

convoluted sentences; either way, the analysis must be done, and the sentence construction must be varied. Teaching this method of sentence combining can also aid in grammar and mechanics learning.

By teaching sentence combing effectively, grammar improves. The student begins to analyze the sentence for necessary components of a complete sentence. In addition to this, the student picks up sentence combining techniques that assist in getting rid of mechanical problems such as run on sentences and comma splices (Saddler, 2010). As one might extrapolate, the instruction of sentence combining techniques is wholistically in line with excellent writing instruction. However, there must be a caution. It is also important to take into account the variations of teacher styles and the effectiveness of those teachers when looking at the improvement of writing skills (Crowhurst, 1983).

If the goal of writing education is to increase the syntactic complexity of writers, then teachers have a direct effect on the outcome (Swan, 1979). In 1970, Kellogg Hunt stated,

> If the average high school graduate is ever to write like a skilled adult, he has nearly as much to learn about how to embed more clauses as he learned in all his public school years. (Maimon, 1978).

This is both an implication of the high school system for not training students to be effective writers, as well as giving hope to the college professors that they can still make an impact on the syntactic growth of their students as they enter into their career stages of adulthood. Unfortunately, there are some pitfalls along the way for the teachers to keep in mind.

According to the study by Maimon in 1978, it was observed that at the college level, those students who were exposed to sentence combining techniques actually produced worse

writing before they improved. This is said to be because of the attempts of the students to "play" with their new found tactics. This dip in writing quality can be daunting for teachers who wish to see improvements right away. For those who are concerned with such issue, there is hopeful literature out there.

Warren Combs, in his 1977 study states that there is evidence to show that there can be significant improvement from sentence combining instruction. However, it must be rigorous in manipulating syntax; and it must be done for an extended period of time. That being said, teachers can teach the technique at the beginning of the semester or year, and continually use the learned skills to reinforce the quality for which the English teaching community is searching. Moreover, if this is a district-wide initiative from K-12, then there can be tremendous gains over the course of one students' educational career. Not all schools or districts have the time available to implement this. However, there is still hope.

Looking at the other end of the spectrum of time allotted to sentence combining instruction, a study out of Canada suggests that 6 weeks might be enough time to obtain significant gains in their syntactic maturity level. This study was performed in 1977, at the University of New Brunswick, by Murray Stewart. College freshman were given a six week writing module, and were given a pre-test and a post test. The results showed that after six weeks, the increase in words per T unit increased by over six. This is a phenomenal gain.

Teachers have no reason not to at least attempt to teach sentence combining, because there is clear evidence that gains happen in short periods of time as well. Sentence combing activities have been found to be an important element in helping students of all ages to become better writers, and that is what ELA teachers are looking to do (Saddler, 2010). Hale (1999),

writes so appropriately, that when there is a desire to write with more style, syntax can be played with; it can especially be manipulated using long and short sentence that end with "whimpers and bangs" (p. 186). She understands the necessity to teach variety in writing.

Conclusion

Grammar, mechanics, syntax, and sentence combining instruction are all integral parts of the wholistic art of instructing writing. The importance of one over another has been discussed for years. The great minds in education may argue for, or against, one or another part of writing instruction; nonetheless, it is clear from the literature that if we as educators do not continue to strive to instruct writing when students are beginning their school careers, it will be difficult for them when they get to university. We as educators must prepare them for a life-long love and respect for the writing process.

Methodology and Procedures

Sentence-combining is not a new concept. In fact, it is a concept that was first based out of Noam Chomsky's theories of grammar. There is a serious issue with graduating high school students not being able to write in a manner that is consistent with the standards of colleges and universities across the country. Although there is research to suggest that sentence-combining instruction is wholistic in nature, and is beneficial to K-12 students, there is no concerted effort in the Hawkins County Schools to promote and teach this technique. If we are going to improve the writing of our students to a level that is acceptable to the colleges and universities, as well as prepare them for careers, then we must attempt to find methods that will be both engaging and effective for the students.

The purpose of this research was to determine if there was value in introducing sentence combining instruction, through the use of cardio-syntactic analysis, in order to improve the writing quality of the students.

Population

The high school selected for this study was a comprehensive four-year high school enrolling 1223 students in grades nine through twelve. The school opened in the fall of 1979 and graduated its first senior class in the spring of 1980. The Southern Association of Colleges and Schools and the College Board accredit this school.

The state report card for 2014 summarize that 45.5% of the students taught were considered economically disadvantaged with 21.6% qualifying under Title 1. Over 97% of the families were white with the remainder being of minority status. The secondary school in which this study was performed mirrors the county percentages with the exception of having closer to

48% disadvantaged. For this reason, many of the district's students were considered at risk for drop out.

Sample

The high school students for this study came from a junior year honors English class. The class consisted of 35 students who were randomly assigned to experimental and control groups. The experimental group was comprised of 17 students, and the control group had 18 students.

Data Collection Instruments

Data were collected through the use of a rubric. The experimental group was taught cardio-syntactic analysis, for three class blocks of 80 minutes each, using direct instruction techniques; individual examination and analysis of prepared writings by American authors such as Hemingway, Hawthorne, Salinger, and Cather; graphical analytics; individual writing; peer review; and revision writing. Meanwhile, the control group was in the library working, in pairs, on creating educational games in such areas as: grammar, spelling, vocabulary, and mechanics. After both the experimental group and the control group were taught, they were administered a writing examination. The essay exam was graded using a rubric. The grading was performed by two independent teachers; they were neither the teacher of record, nor present during the instruction. The rubric included the following criteria:

- **Introduction.** Assessed how well the student stated the main topic and previewed the structure of the paper.
- **Adherence.** Assessed how well the student focused on the question at hand.
- **Conclusion.** Assessed the strength of the writer to leave the reader with a feeling of understanding.

- **Pacing.** Assessed if the writer knows how to pace the essay as to keep the reader's interest.

- **Flow and Rhythm**. Assessed if everything was logically ordered and topics were well discussed.

- **Sentence Structure.** Assessed the construction and varying of sentence structure.

- **Sentence Length.** Assessed that every paragraph has sentences of varying length as to keep the interest of the reader.

- **Grammar and Spelling.** Assessed the mechanics of the paper.

- **Transitions.** Assessed the variety and accuracy of transitions used.

- **Voice**. Assessed if the writer allowed his voice to permeate the task. Did he try to imbue his own ideas, or just regurgitate others style and words?

Procedures

Approval for the project was granted by the principal of the school, and notification of intent and request for consent letters were sent home to the parents. Students were informed that there would be an essay assigned to do in class based on a narrative writing prompt. Students were informed that there would be one section of instruction that half of the class would not receive. During those days, they would be taken out of the classroom, and given an alternative learning task. Students and parents were informed that participation was voluntary and student grades would not be affected for the term.

The students were assigned to experimental and control groups. The control group students were sent to work on a game creation project for three days in the library. At this time, the experimental group was given the instruction in cardio-syntactic analysis. This instruction

included the sentence combining techniques of semicolon usage, investigating how the syntax of

great authors of the past is graphed and analyzed, and writing, analyzing, peer reviewing, and

revising their own works.

After instruction of the experimental group was completed, both groups were

administered the same prompt to complete in the 120 minute class period. Only the student

unique identifier was used as a means of knowing the author. The essays were then graded, using

a rubric, by two independent English teachers. The rubric criteria included: introduction, focus

on topic, sequencing, pacing, grammar and spelling, sentence structure, sentence length,

transitions, and conclusion. The data collected for both the experimental and the control groups

were analyzed to determine if there was any significant difference between the groups.

Results

Three research questions were used to guide the analysis of data.

- **Research Question 1.** Is there a difference in overall scores earned between English students who were given the Cardio-Syntactic instruction than those who were not?

- **Research Question 2.** Is there a difference in scores in the sentence structure category of the rubric between English students who were given the cardio-syntactic instruction than those who were not?

- **Research Question 3.** Is there a difference in scores in the sentence length category of the rubric between English students who were given the cardio-syntactic instruction than those who were not?

Each research question was followed by a research hypothesis. All research questions

were analyzed using independent t-tests with a .05 level of significance. All the three

questions yielded significant results and therefore the null hypotheses were rejected.

Results are displayed in Tables 1, 2 and 3 respectfully.

Table 1

Independent t-test on the overall scores for experimental and control groups

Group	M	SD	df	t-value	2-tail Sig.	ES
Experimental	89.74	2.285	23	4.082	0.001	3.2
Control	84.22	0.787				

Note. p<0.05

Table 2

Independent t-test on scores earned, for the sentence structure rubric category, between the experimental and control groups.

Group	M	SD	df	t-value	2-tail Sig.	ES
Experimental	9.21	0.398	33	5.298	0.001	1.8
Control	8.03	0.831				

Note. p<0.05

Table 3

Independent t-test on scores earned, for the sentence length rubric category, between the experimental and control groups.

Group	M	SD	df	t-value	2-tail Sig.	ES
Experimental	9.62	0.416	22.444	4.594	0.001	1.5
Control	8.39	1.051				

Note. p<0.05

Discussion

Three research questions were addressed in this study.

Focusing on Research Question 1, which asked if there was a difference in overall scores earned between English students who were given the Cardio-Syntactic instruction than those who were not, an independent t-test revealed a significant difference between the experimental and the control group t (23.557)= 4.082, p < 00.5. The effect size was calculated to be 3.2; therefore, the Cohen's d effect size is considered quite large. Thus, the null hypothesis was rejected.

Students who were chosen to be in the experimental and control group were randomly selected, and were only told that the experimental group would be given instruction in Cardio-Syntactic Analysis. Prior to being separated, the class as a whole was instructed on basic punctuation rules; grammar rules; basic sentence structure vocabulary such as simple, compound, complex, and compound complex, but were not apprised of the importance of varying these structures. Once separated, the instruction in Cardio-Syntactic Analysis gave the experimental group an advantage over the control group.

Shifting the focus to Research Question 2, which asked if there was a difference in scores in the sentence structure category of the rubric between English students who were given the cardio-syntactic instruction than those who were not, an independent t-test revealed a significant difference between the experimental and the control group t (33)= 5.298, p < 00.5. The effect size was calculated to be 1.8; therefore, the Cohen's d effect size is considered quite large. Thus, the null hypothesis was rejected.

Students who were given Cardio-Syntactic Analysis instruction saw first-hand the way authors use sentence structure to build interest in their readers. The students were shown how to effectively use sentence structures to convey specific mood and tone to the reader. Students read excerpts from great authors such as Melville, Crane, Cather, and Conrad; they then looked specifically at the sentence structures of these excerpts. What they found was that these greats of world literature used varied sentence structure to capture the attention, even subconsciously of the reader. The students then analyzed a piece of work they wrote earlier in the semester and looked at the sentence structure variation. What they found was that there was very little in the way of variety. Many came to a remarkable conclusion.

Students were amazed at how mundane their work was. Even if they had used a plethora of high level vocabulary words in their essays, they still felt that the story did not grab them as much as the greats of world literature did. Students saw immediately that theses excerpts were the exemplars that they must strive to be in order to better their own writing. Upon this discovery, the excitement in the room was palpable. For the first time, writing was becoming exciting for them is what many students said.

Looking toward Research Question 3, which asked if there was a difference in scores in the sentence length category of the rubric between English students who were given the cardio-syntactic instruction than those who were not, an independent t-test revealed a significant difference between the experimental and the control group t (22.444)= 4.594, p < 00.5. The effect size was calculated to be 1.5; therefore, the Cohen's d effect size is considered quite large. Thus, the null hypothesis was rejected.

Answering this question required the most interactive and cross-curricular instructional techniques. Students were asked to count the number of sentences in the excerpt. Then they were asked to count how many words per sentence there were. The students then created a line chart to graphically show the changes in the number of words per sentence – or changes in the syntactical arrangement as it came to be known to them. After the chart was created, the students averaged the number of words per sentence. Lastly, the students were asked to read the passage again; this time, they were to pay close attention to the sentences that led up to, and came out of, any large shift in sentence length. What they learned from this exercise was phenomenal.

Students immediately noticed that each one of the line charts mimicked what one would expect to see on an EKG monitor. They saw a heartbeat. The looks on their faces was that of astonishment. One student even said, "Wait, that is why we were more into this writing than our own; they grabbed our hearts didn't they." When asked about the large shifts in sentence length, the students analyzed the writing from a whole new perspective. They noticed that when action was building, or discussion was intense, the sentences would grow longer. When it was over the author gave the reader a "breather" – to use their words. This visual representation of the syntax of the excerpt was then performed on their essay. The result was amazing.

Students found that either they were using too many words and needed to give the reader a "break", or they found that were using very simple sentences all the time and needed to combine sentences in varied ways to excite the reader. They then rewrote their essays using what they had learned, and the students were so proud of the work they had done. They found efficacy in the process.

The findings from the conducted research are consistent with the findings of Wright

(1923), Burnham (1947, Combs (1976), Grobe (1979), and Leahy (2005); this research confirms

that writing instruction must be all-inclusive in instruction, or it is doomed to failure in practice.

Elizabeth Oliver put it best when she wrote that students can be given an "arsenal of patterns" by

which to learn (2014).

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