An Analysis of the Argumentative Writing Skills of Academically Underprepared College Students

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ABSTRACT

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The present study was conducted to extend what is known about the writing skills of low achieving postsecondary students. Using an archival data set, a sample of argumentative essays written by community college developmental (remedial) education students was analyzed. Scoring procedures for argumentation development were implemented based on a framework developed by Ferretti, Lewis, and Andrews-Weckerly (2009) and adapted by the current author to accommodate the tasks of the writing prompt. The goals of the study were: (1) to determine to what extent the argumentative essays written by community college remedial students are inclusive of functional argumentative elements, coherent, cohesive, and of high quality; and (2) to determine to what extent the written components (i.e., coherence, cohesion, inclusion of functional elements, length) and demographic characteristics of the writer (i.e., reading ability, science interest, science knowledge, gender, native language) contribute to the overall quality of argumentative essays.

Descriptive statistics and ordinal logistic regression were used to analyze a total of 112 writing samples. It was found that on average, the argumentation in the essays was only partially developed and coherent; the essays contained a relatively moderate amount of functional elements and included a minimal amount of cohesive ties. The results also indicated that the written components of the argumentative essays and the demographic characteristics of the
writer, when combined, significantly contribute to the overall quality of the argumentative essays. The coherence of the essays was found to have the highest odds ratio to essay quality in comparison to any other variable analyzed. These findings suggest the need for instruction focusing largely on essay coherence, as well as argumentation development, in order to improve argumentative writing quality.
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This work is dedicated to my parents, Barry and Ferne Chase, and to my fiancé, Aaron Schuman.

To my father,

Barry Chase,

who has continuously supported the pursuit of my goals and dreams.

To my mother,

Ferne Chase,

who instilled in me the value of education, and who is my constant role model.

To my future husband,

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Argumentative writing is a crucial skill during the school years and beyond (Nippold, 2000; Crowhurst, 1990). In American society, “the literate, educated person is expected to be able to articulate a position on important matters so as to persuade colleagues, fellow citizens, governments, and bureaucrats” (Crowhurst, 1990, p. 349). Academically, written argumentation helps students acquire knowledge (Driver, Newton, & Osborne, 2000; Schwarz, Neuman, Gil, & Iiya, 2003; Zohar & Nemeth, 2002), promotes scientific thinking skills (C. Shanahan, 2004), and enhances comprehension of history and social studies (De La Paz, 2005; Wiley & Voss, 1999). Furthermore, written argumentation can lead to an increase in intrinsic motivation and problem-solving performance in the academic setting (Chinn, 2006).

Nationwide, students are expected to comprehend, evaluate, and construct written arguments in various content-area disciplines (Ackerman, 1993; National Center for History in Schools, 1996). Argumentative writing requires students to embrace a particular point of view and try to convince the reader to adopt the same perspective or to perform a certain action (Nippold, Ward-Lonergan, & Fanning, 2005). This form of essay writing requires the writer to draw upon his or her knowledge of argumentative discourse and create subgoals related to supporting a thesis (Scardamalia & Bereiter, 1986). The writer must take a stance, anticipate the audience’s position, justify his or her own position, consider the alternative positions, and if appropriate, rebut the opposing positions (Ferretti, MacArthur, & Dowdy, 2000). Subsequently, a fully developed argumentative essay is structured in a certain way that includes a statement of an opinion with support, a statement of a counterargument, a rebuttal, and a concluding
statement that supports the initial opinion. Given the many cognitive demands on the writer, it is not surprising that argumentative writing is difficult for many students to master (Felton & Herko, 2004).

Argumentative writing skills are often included in state and graduate benchmark tests (e.g., New York State English Language Arts (ELA) test for learning standards, American College Testing (ACT), Scholastic Assessment Test (SAT), and Graduate Record Examination (GRE)). However, national assessments indicate that approximately 40% of 12th graders are not adequately skilled in producing written arguments (National Assessment of Educational Progress, 2007, 1998, 1996). Of the academically underprepared students who pursue higher education, many enroll in community colleges (Calcagno, Crosta, Bailey, & Jenkins, 2007; Perin, 2006; Southard & Clay, 2004) but lack the academic skills required for postsecondary work (McCabe, 2003). The current study focuses on the argumentative writing skills of a sample of community college students who have a history of low academic achievement.

The purpose of the present study is to extend previous research on argumentative writing and to examine an under-researched population, community college remedial students, who are at present a growing population in the U.S. (Perin, 2003). This chapter provides a review of the key literature on argumentative writing, and begins with a summary of the main cognitive processes of argumentative writing. Terminology varies in studies of argumentative writing, with some authors referring to this activity as persuasive writing or opinion writing. For the sake of clarity, the primary term “argumentative writing” will be employed in the current paper. This chapter begins with an overview of the cognitive process of writing and focuses on studies of argumentative writing performance and elements of argumentative discourse, coherence, and cohesion, which serve to inform the present study. In addition, a literature review is presented
on key learner variables, such as reading ability, prior knowledge, interest, native language, and gender, which have been documented to impact argumentative writing performance. Furthermore, an overview of what is known regarding the status of secondary and postsecondary writing skills is presented, as well as implications for the role of community colleges in the American educational system. The growing trends and characteristics of community college students are also presented. Gaps in the literature are identified and a rationale for the current study is proposed. This chapter concludes with the study’s research questions.

**Cognitive Processes of Writing**

Writing ability plays an important role in students’ learning. The act of writing creates an environment for the development of cognitive and organizational strategies whereby students link new concepts with familiar ones, synthesize knowledge, explore relations and implications, outline information, and strengthen conceptual frameworks (Bangert-Drowns, Hurley, & Wilkinson, 2004; Scardamalia & Bereiter, 1986). Furthermore, the act of writing involves self-monitoring, planning, concept-building, and the review of information processes, which promote the building of domain knowledge (Bangert-Drowns et al., 2004). Several authors have noted that the amount of domain knowledge in the content-areas of science, social studies, and mathematics affects the learning of new information, such that that the more one knows about a particular subject the more one can effectively learn about it (Alexander, 1997; Bransford, Brown, & Cocking, 1999).

Hayes (1996) proposed a widely accepted model of writing that identifies two major components involved in the writing process: the *individual*, which refers to the person composing the text, and the *task environment*, which refers to the physical and social attributes
of text production. The physical characteristics of the task environment refer to the text being produced by the writer, and the medium for composing, such as handwriting or word processor; the audience for the composition represents the social attributes of the task environment. Hayes’ (1996) model also accounts for motivation, affect, working memory, long-term memory, and cognitive processes.

In the Hayes (1996) model, a writer must be motivated to write, maintain positive attitudes towards the writing process, have specific goals when writing, and hold the belief that the results of writing is worth the time and effort expended. Writers must draw on long-term memory and possess topic, linguistic, and genre knowledge in order to create a written text. Additionally, writers must be aware of the audience for whom they are writing. The Hayes (1996) model refers to this as the social influence of the task environment. In addition, a writer needs to understand how to modify the topic, and apply linguistic, and genre knowledge. Hayes (1996) highlights that the knowledge from long-term memory represents three main elements that underlie the cognitive processes used in writing: reflection (i.e., prewriting, also known as planning), text production (i.e., translating, generating, and drafting text), and text interpretation (i.e., revision).

Effective functioning of the individuals’ working memory is also needed during the writing process, which may include the writers’ retrieval of multiple types of information from memory (i.e., graphemes, syntax, ideas) while concurrently organizing this information and transcribing it onto paper (Hayes, 1996; Kellogg, 1996). Working memory is also used to access and apply phonological, visual, and semantic information, and may affect aspects of the subcomponents of the writing process including handwriting, syntax, spelling, and organization of content. Application of these components never becomes entirely automatic, which
emphasizes a contrast with reading in that word recognition (the companion process to spelling) is automatic among proficient readers.

Students may experience difficulties in either some or all of the above-mentioned writing components. For example, Hayes and Flower (1980, 1987) described difficulties some students have in choosing topics to write about (i.e., planning and prewriting), with the actual act of writing words and ideas on paper (i.e., translating and drafting), with identifying unsupported or unclear ideas that need to be modified (i.e., revising), with grammatical, punctuation, and spelling errors (i.e., editing), and/or with critically thinking about the feedback given by others (i.e., evaluating). In addition, students must tend to the specific demands for each form of writing.

**Components of Argumentative Writing**

Argumentative writing draws upon the various cognitive processes identified within the Hayes (1996) model. In addition, the writer must also be aware of the various elements that are specific to the genre of argumentation. Toulmin (1958) proposed a model of argumentation that has been widely cited by researchers (Connor, 1990; Connor & Lauer, 1985; Knudson, 1992; Scardamalia & Paris, 1985). According to Toulmin (1958), argumentation is composed of the following elements: a) Claim, which is an assertion presented in response to a problem, b) Data, which includes the evidence or grounds on which claims are made, c) Warrant, which supports the link between the claim and data, d) Backing, known as support of the warrant, e) Qualifier, which is a term indicating the probable nature of the claim, and f) a Reservation, which refers to the conditions under which the warrant will not hold and cannot support the claim (Crammond, 1998). These elements represent the basis of argumentative discourse and an organizational framework for argumentative essay writing.
Connor (1990), Ferris (1994), and Knudson (1992) reported that the overall quality and persuasiveness of essays written by high school and college students could be predicted by the quality of some of Toulmin’s elements, e.g., claims, data, and warrants. In addition, researchers (Knudson, 1992; Matsuhashi & Gordon, 1985; Scardamalia et al., 1982; Scardamalia & Paris, 1985) who tested instructional programs based on Toulmin’s (1958) model reported improvements in students’ use of claims and data in their argumentative writing (Crammond, 1998).

Additional researchers have expanded upon Toulmin’s (1958) model of argumentation and categorized the components of argumentative writing as functional and nonfunctional elements (Ferretti et al., 2009; Monroe & Troia, 2006; De La Paz, 2005; Sexton et al., 1998) The functional elements are: (a) standpoint (i.e., claim or premise) for or against the topic, (b) reasons (i.e., data) to support the premise or contrasting premise or to refute counterarguments, (c) elaborations (i.e., warrant and backing) for the reason(s) and standpoint(s) (d) alternative standpoint(s) for or against the topic; (e) reason(s) for the alternative standpoint(s), counterargument, (f) rebuttal(s), (g) introductions, (h) conclusions, and (j) rhetorically functional repetitions (see Appendix C for a description of each element).

Researchers who have utilized the model have suggested that these functional and nonfunctional elements may or may not occur in linear order in an essay. Further categorization of functional elements includes the distinction between “myside” and “yourside” components (Wolf et al., 2008). The “myside” elements represent the author’s standpoint, supporting reasons for the author’s standpoint, and elaborations for the author’s standpoint, whereas the “yourside” components represent the alternative perspective, counterarguments of the author’s standpoint, and rebuttals of the counterargument. In contrast, nonfunctional elements comprise of: (a)
repetitions that do not serve some rhetorical purpose and (b) information included in the essay that is not relevant to the topic (Ferretti et al., 2009; Monroe & Troia, 2006; De La Paz, 2005; Sexton et al., 1998).

Several studies have investigated the presence of functional elements in students’ argumentative writing. In a study of Crammond (1998) found developmental differences among 6th grade, 8th grade, and 10th grade students, and adult professional writers. The average number of functional elements (with standard deviations) included in essays written by these participants to support a claim was $M=9.23 (SD = 5.45)$, $M=9.67 (SD = 3.23)$, $M=8.83 (SD = 4.15)$, and $M=30.43 (SD = 13.43)$ for the 6th, 8th, and 10th grade, and adult group, respectively. Ferretti et al. (2009) reported that the inclusion of functional elements in argumentative essays written by students differed by grade (4th or 6th), disability status (typically achieving or learning disabled), and goal condition (general goal or elaborated goal). Besides developmental differences, deficits in the use of functional elements have been reported. In regard to “yourside” elements such as counterarguments and rebuttals, Cooper et al. (1984) reported that only 16% of typically achieving college freshmen took into account an opposing point of view when writing an argumentative essay. Further, Golder and Coirier (1994) found that less than 20% of 11-12-year old students used counterarguments when writing argumentative essays, compared with over 70% of 13-16 year old students.

Studying the argumentative writing of three middle school students with learning disabilities, Monroe and Troia (2006) found that, following explicit instruction on argumentative strategy use, inclusion of functional elements improved by 23% over initial writing performance. In a study of 5th and 6th grade students with learning disabilities (Sexton, Harris, & Graham, 1998), six students were given explicit instruction in planning and writing argumentative essays
using an approach called Self-Regulated Strategy Development (SRSD). Following instruction, increases in the average number of functional elements and average word count were found. Inclusion of functional elements increased by 217% ($M = 6.7$) and word count increased by 207% ($M = 59.2$). Of twenty-six essays written at baseline, almost all (92%) included a fully explained premise (i.e., standpoint), and only a few (8%) included a conclusion. With the exception of six essays, the baseline essays included at least one reason to support the author’s premise but no more than two supporting reasons in the essay. All of the 20 post-instruction essays produced by the six students included a fully stated premise, supporting reasons, and a concluding statement. On average, only 7% of the content of the argumentative essays was considered nonfunctional following the strategy instruction, compared to 38% at baseline. The overall quality of the argumentative essays, rated on a holistic scale of 1 to 8 that considered essay development, organization, and ideation, was found to be low at baseline ($M = 2.1$) and improved by 227.7% ($M = 4.7$) after explicit instruction on argumentative essay writing.

Some studies have asked participants to explicitly write full argumentative essays, defined as including counterarguments and a rebuttal, whereas others only explicitly ask for the statement of opinions. For example, Wong, Butler, Fisczere, and Kuperis (1996) taught a group of students to write argumentative essays that included three reasons to support the thesis. Santos and Santos (1999), and Nussbaum and Kardash (2005) both suggested that the use of a prompt that explicitly directs writers to persuade the reader might actually inhibit the production of counterarguments and alternative standpoints, since the writer following such instructions may not realized that including a counterargument and rebuttal can strengthen persuasiveness.

Attempting to improve the quality of argumentative writing, Nussbaum and Kardash (2005)
found that that provision of background text on the writing topics stimulated students’ thinking and improved the quality of written argumentation.

**Argumentative Structures and the Pragma-Dialectical Framework**

The functional and nonfunctional elements of argumentative writing represent key components of the writer’s argument structure. The “pragma-dialectical framework” of van Eemeren, Grootendorst, & Henkemans (2002; 1996) and van Eemeren & Grootendorst (1992) extends Toulmin’s (1958) model on argumentation, and provides a basis for a graphical model used by Ferretti, Lewis, and Andrews-Weckerly (2009) that depicts the breadth and depth of the structure of an argumentative essay. The pragma-dialectical model proposes that written argumentation requires the writer to “put forward a constellation of propositions intended to justify (or refute) the standpoint before a rational judge” (van Eemeren, et al. 1996, p. 5). Furthermore, the “constellation of propositions has, due to its justificatory or refutatory force, a special communicative function” (p.4). The constellation of propositions works in effort to affect the acceptability of the standpoint that is put forth by the writer (Ferretti, Lewis, & Andrews-Weckerly, 2007; Lewis, 2008). As such, the pragma-dialectical framework provides an approach for graphically depicting elements of argumentative discourse. This graphical depiction allows for an in-depth way to analyze, evaluate and present the argumentative structure put forth by the writer, as well as to effectively determine the strength and adequacy of the writer’s argument.

A position statement may consist of a single argument, i.e. a standpoint and a reason for the standpoint. However, the structure of argumentation may be much more complex (van Eemeren, Grootendorst, & Henkemans 2002). Written arguments may be represented as
“subordinative” and “coordinative” arguments (van Eemeren, Grootendorst, & Henkemans 2002). In subordinative arguments, the writer’s argument is supported by reasons that have been stated earlier in the essay, whereas coordinative arguments include a combination of reasons that, when taken together, constitute the defense of the author’s standpoint. In addition, “multiple argumentation” (van Eemeren et al., 2002) consists of more than one alternative defense for the same standpoint, e.g., a standpoint and two separate reasons for the standpoint. As van Eemeren et al. (2002) note, the use of indicators or discourse markers such as and, because, which, and or, may sometimes suggest whether the writer’s argumentation is a subordinative, coordinative, or a multiple argument. Often, novice or unskilled writers provide no such indicators or discourse markers to help distinguish among argumentative structures (van Eemeren et al., 2002).

A graphical adaptation of the van Eemeren et al. (2002) pragma-dialectical framework was developed and applied to the argumentative writing of typically achieving and learning disabled students in elementary and postsecondary education to analyze the structure of written argumentation (Ferretti, Lewis, & Andrews-Weckerly, 2009; Lewis, 2008; Lewis et al., 2004; Andrews-Weckerly et al., 2004). A graphical coding system developed in this research distinguishes between among the functional and nonfunctional elements of an argumentative structure and the relationship among these elements. The researchers developed rules to distinguish between the subordinate and coordinative relationships among the elements in the argumentative structure (see Ferretti et al., 2009; van Eemeren & Grootendorst, 1992; van Eemeren et al., 2002). Discourse markers such as and, or, and because (van Eemeren et al., 2002), when present, also provide guiding information regarding the relationship between the argumentative structure and the elements.
Research using the pragma-dialectical model has demonstrated that inclusion of particular argumentative structures is predictive of overall essay quality (Ferretti et al., 2009; Lewis 2008). Ferretti et al. (2009) found that the structural analyses derived from the essays written by 4th and 6th grade students accounted for 70% of the variance in the overall persuasive quality of students’ essays. This finding was consistent with and extended the findings reported by Ferretti et al. (2000), which indicated that about 45% of the variance in the overall persuasive quality of essays was accounted for by the presence of elements of argumentative discourse. Furthermore, a multiple regression analysis in Ferretti et al. (2009) has indicated that the effects on writing quality of grade level, disability status, and writing goal condition could be fully accounted for by the measures derived from the argumentative structures. An example of a graphical representation for the argumentative writing framework used in Ferretti et al. (2009) is presented in Figure 1.
Dear Ms. ________,

I believe that out of class work already takes up enough of the student body’s time. Instead of increasing it, I think you should decrease for obvious reasons.

One reason is that if student had less homework, they would have more time to study. Then maybe they wouldn’t get F’s all the time. And every assignment we have equals half and hour less for our studies.

Another reason for less of our class work is that some of it just wastes time. The students would do the assignment, but learn nothing. And they waste a lot of time on the assignments, causing them to sleep late at night and be tired during school hours.

I know that some people believe in more homework. They say that homework keeps children on the ball, but shouldn’t school be enough for that. And they also say that homework gives kids work to do so they aren’t lazy. But don’t chores count as work too.

In conclusion, we shouldn’t have more homework. Actually, we shouldn’t have less. Out of class work can just take away study time and wastes your other time, so why should we have more?

Note. SP1 = Standpoint 1; R1 = Reason 1; R2 = Reason 2; R1a = Reason 1, 1st coordinative string; R1b = Reason 1, 2nd coordinative string; R1c = Reason 1, 3rd coordinative string; R1d = Reason 1, 4th coordinative string.
As exemplified through the application of pragma-dialectical framework of van Eemeren, Grootendorst, and Henkemans (2002), arguments are not merely reducible to the elements of which they are comprised. Rather, arguments represent a constellation of propositions that possess a structure and organization that, together, increase the acceptability of the writer’s standpoint. The work of Ferretti et al. has indicated that the argumentative structures derived from the essays not only allows for researchers to graphically represent the relationships among argumentative elements, but to also better assess the strength of the argument(s) presented in support of the writer’s claim, i.e., premise or standpoint. The identification of where and how writers include the functional and nonfunctional elements within written argumentative essays points to how writers formulate, organize, and produce written argumentation. The present study utilizes the pragma-dialectical framework and its corresponding graphical representation to analyze the argumentative writing of a sample of low-achieving community college students.

**Coherence and Cohesion**

The presence of argumentative elements alone may not fully account for the quality of argumentative writing. It appears that aspects of coherence and cohesion, including organization of the written material and the use of lexical cohesive ties, respectively, are predictive of the overall quality of argumentative writing (Conner & Lauer, 1985; McCulley, 1985). Coherence and cohesion are terms that are often used interchangeably in writing research. Although the terms are conceptually related, they refer to two distinct aspects of writing.

*Coherence* refers to the overall structure, plan, or schema that organized the author’s propositions and ideas (Bamberg, 1984), whereas *cohesion* describes the specific surface level ties (i.e., repetition, substitution, ellipsis, conjunction, and lexical ties) that create connections
between sentences (Halladay & Hassan, 1976). Of these surface level cohesive ties, *lexical* cohesive ties are used most often by writers (Tierney & Mosenthal, 1984) and have found to have the strongest relationship to coherence and writing quality (Fitzgerald & Spiegel, 1986).

Cohesion is most commonly viewed as a subset of coherence, and represents one of the factors that create coherence in a text (Witte & Faigley, 1981; McCulley, 1985; Bamberg, 1984; Fitzgerald & Spiegel, 1986 & 1990; Morgan & Sellner, 1980). In a study of a random sample of 493 argumentative essays written for the National Assessment of Educational Progress, McCulley (1985) found that coherence and cohesion were related, with cohesion accounting for 53% of the variance in coherence. Notably, Bamberg (1984) found that use of cohesive ties represents one of seven factors that represent coherence in an essay; the other six factors include the writer’s explicit identification of a topic, absence of shifting or digression of topics, creation of a context or situation for the topic, organization of details according to a sustained plan, inclusion of a concluding statement, and a smooth flow of discourse, i.e., few or no grammatical and/or mechanical errors that interrupt the reading process of the essay.

Witte and Faigley (1981) studied cohesion in compositions written by college students. The researchers suggested that the type and frequency of cohesive ties identified in the essays appeared to influence the style, organization, and overall quality of the essays. However, the researchers also proposed that while cohesive relationships may ultimately affect writing quality in some ways, there was no evidence in their sample to suggest that a larger or smaller number of cohesive ties of a particular type will positively affect writing quality. Other research showed that the frequency of coherence and cohesive ties in argumentative essays, as measured by Bamberg's (1984) Holistic Scale of Coherence, varied as a function of grade level and type of
writing assignment (Crowhurst, 1987; McCutchen, 1986, 1987). Given the potential effect on quality, coherence and cohesion represent important elements of argumentative writing.

De La Paz (1995) investigated aspects of coherence, and its relationship to argumentative writing, by analyzing the argumentative writing of forty-two 5th, 6th, and 7th grade students with learning disabilities. In this research, the coherence measure devised by Bamberg (1984) was adapted to assess two primary components of coherence: \textit{coherent organization of ideas} and \textit{coherent use of linguistic ties}, i.e., cohesive ties. De La Paz (1995) conceptualized these dimensions as “coherence-organization” and “coherence-linguistic ties”, respectively. A 0 to 3-point scale for coherence-organization was developed to measure whether the ideas in an argumentative essay were arranged according to an overall plan and integrated into a coherent whole. A 0 to 3 point scale was also developed for coherence-linguistic ties, to assess whether the writer either over-or under-used cohesive markers to signal relationships within parts of the essay. The cohesive ties identified in De La Paz’s study, specific to the genre of argumentative writing, served to introduce ideas, add supporting ideas, refute an earlier idea, and signal a conclusion or consequence. The study included the provision of explicit strategy instruction on planning, writing, and revising argumentative essays. It was found that, after instruction, the participants’ essays were more coherently organized, included more use of linguistic ties following, and were of higher quality than those written during baseline.

\textbf{Reading Ability and Writing Performance}

The written components of the essay alone may not fully account for performance in argumentative writing. Significant characteristics of the writer may contribute to writing quality as well.
In academic settings, writing is inextricably related to reading. Based on a review of the literature, Fitzgerald and Shanahan (2000) noted important overlaps in cognition and knowledge in the two sets of skills. Reading and writing both rely on the representation of various aspects of linguistic knowledge levels (i.e., phonemic, orthographic, semantic, syntactic, pragmatic) and are affected by similar contextual constraints. The authors proposed that reading and writing have in common four types of superordinate knowledge: metaknowledge (i.e., knowledge of the function of reading and writing, monitoring one’s own meaning making and word identification or production strategies, monitoring of one’s knowledge, pragmatics), prior knowledge about substance and practice (i.e., semantics, prior knowledge, content knowledge gained while reading and writing), knowledge about universal text attributes (i.e., graphophonics, syntax, text format), and procedural knowledge (i.e., the skills to negotiate reading and writing).

Despite the conceptual and linguistic overlaps between reading and writing, Fitzgerald and Shanahan (2000) also identified some important differences between the two skills, and suggested that they are learned independently. They identified that the amount of shared variance found between reading and writing in correlational studies has never exceeded .50, despite similarities often presumed by researchers and theoreticians.

A study conducted by Shanahan (1984) supports the concept of differences between reading and writing. Shanahan (1984) conducted an exploratory analysis of variables from reading measures (e.g., the Phonetic Analysis Test of the Stanford Diagnostic Reading Tests, the Reading Comprehension Test of the Gates-MacGinitie Reading Tests, and the Vocabulary tests of both of the aforementioned measures) and writing measures (e.g., analyses of vocabulary diversity, syntactic complexity, qualitative and quantitative measures of spelling and organization). A total of 256 second graders and 251 fifth graders were administered these
literacy measures, and a canonical correlational analysis was employed for each grade level of level and for 69 beginning and 137 proficient readers that were derived from the original samples.

Shanahan (1984) found that the word recognition factors taken from the reading set were most related to the spelling variables of the writing component at both grade levels and at the beginning reader level. Further, for proficient readers, the ability to structure prose in complex ways and to use a variety of vocabulary in writing was related to a prose comprehension factor. Of note, however, reading or writing was found to explain no more than 45% of the variance in the opposite test set in any of the analyses (Shanahan, 1984).

**Prior Knowledge and Writing Performance**

Prior knowledge has been found to affect the learning of new information (Alexander, 1997; Bransford, Brown, & Cocking, 1999) in that the more one knows about a particular domain, the more one can learn about it. As such, acquiring new information may be enhanced by writing experience (Wallace, Hand & Prain, 2004; Shanahan, 2004). A meta-analysis of 48 writing-to-learn studies indicated that writing had a positive impact on various outcomes of school learning (Bangert-Drowns, Hurley, & Wilkinson, 2004).

In the academic setting, prior knowledge plays an important role in one’s comprehension of text. Understanding this role helps when considering academic writing, since reading and writing are closely related in school settings (Fitzgerald & Shanahan, 2000). In using prior knowledge, the reader actively draws on both content knowledge applied previously, and personal experience in order to draw meaning from new information in text. The more skills and information the reader brings to the text, the greater the likelihood that the reader will learn and
remember what was read (Vacca and Vacca, 2007; Alvermann & Phelps, 2002). Thus, activating readers’ prior knowledge prepares the reader to make logical connections, draw conclusions, and assimilate new ideas (Barton, Heidema, & Jordan, 2002). These comprehension skills may affect one’s ability to produce a written summary; if a reader cannot comprehend the given passage, then it would be extremely difficult for that reader to produce a coherent, accurate written summarization or to construct a logical position statement (i.e., argumentative essay) based on the presented text.

Since prior knowledge plays a critical role in helping students interpret and comprehend information, students who lack prior knowledge in such content-areas as science, history, or mathematics may use inefficient strategies for learning and applying information, and may experience reduced interest in the subject area (Schiefele, 1991; Shanahan, 2004; Holliday, Yore, and Alvermann, 1994; Rivard, 1994). Prior knowledge provides a fundamental framework for students to connect the critical references in texts and to fill the conceptual gaps that may be present through inaccurate or inadequate textbooks (O’Reilly & McNamara, 2007).

O’Reilly and McNamara explored the role of prior knowledge on achievement, and specifically, examined the extent to which students’ \( n=1,651 \) science [domain] knowledge, reading strategy knowledge, and reading skill predict science achievement, as measured by traditional content-based texts. The dependent variable of science achievement was measured in terms of students’ comprehension of a science passage, science course grade, and state science test scores. Results from a multiple-regression analysis indicated that science knowledge, reading skill, and reading strategy knowledge reliably predicted all three measures of science achievement. Further, the findings revealed that reading skill helped learners compensate for deficits in science knowledge for most measures of achievement and had a larger effect on
achievement scores for higher knowledge than lower knowledge students. Future research regarding the effects of writing skill and science knowledge as predictors of achievement would further extend the work of O’Reilly and McNamara, and would examine the role of writing on achievement and learning.

**Interest and Writing Performance**

Researchers have identified that interest is an influential variable in academic performance (Pintrich, Marx, & Boyle, 1993). Students who are interested in a topic covered in the content-area discipline will likely learn the topic better than students who lack interest in the topic (C. Shanahan, 2004). Furthermore, Pitcher, Albright, DeLaney, Walker, SeunarineSingh, Mogge, Headley, Ridgeway, Peck, Hunt, and Dunston (2007) found that the closer that literacy activities and tasks match the values, needs, and goals of students, the greater the likelihood that those students will exert effort in these tasks and sustain their interest.

The construct of interest, as noted by Hidi and Renniger (2006), is defined as a motivational variable that refers to the “psychological state of engaging or the predisposition to reengage with particular classes of objects, events, or ideas over time” (p.112). Interest may have an influence on individuals’ attention (Ainley, Hidi, & Berndorff, 2002), goals (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, Tauer, 2008; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000), and level of learning (Alexander, 1997; Alexander & Murphy, 1998) within the academic setting.

Hidi, Berndorff, and Ainley (2002) examined the relation between students’ general interest in writing and their genre-specific liking of writing as well as self-efficacy of writing. Hidi et al. (2002) investigated how a combination of motivational and instructional variables
may be utilized in an intervention program designed to improve students’ emotional and cognitive experiences during argumentative writing. A total of 177 sixth grade Canadian students participated in the eight-week study, and all of the students’ primary language was English. The study included a pre-test, intervention, and post-test design, and include two forms of the cognitive and motivational intervention.

The first program of the Hidi, Berndorff, and Ainley (2002) study was implemented for all students, which included instructions on argument writing and incorporated strong motivational features. The second version of the intervention provided students with an additional motivational component consisting of extended collaborative writing activities. A locally developed Interest, Liking and Self-efficacy Questionnaire was used in the pre- and post-intervention. Overall, the intervention programs led to a significant improvement in the quality of children’s argument writing, and the collaborative writing experience was especially effective for boys. Furthermore, the responses to the questionnaires indicated that children’s genre-specific liking of writing and self-efficacy of writing were closely associated and that both of these motivational factors are also associated with their general interest in writing.

Intrinsic rather than extrinsic interest plays a strong role in learning; students who are intrinsically interested in a topic will use more appropriate learning strategies to deeply process text and will be more likely to have a higher quality learning experience than students who are not intrinsically interested in the topic (Schiefele, 1991). Overall, students who perceive tasks as interesting will be more motivated to engage in them, find the work rewarding, and work independently and productively (Zimmerman, & Martinez-Pons, 1991; Collins & Amabile, 1999). Fostering students positive beliefs about writing, promoting authentic writing goals, providing students with a supportive context for writing, and creating a positive emotional
classrooms conditions all affect students motivation to write. It has been documented that students’ beliefs about writing interact with instructional and environmental factors, all of which play a role in affecting interest in literacy tasks (Bruning & Horn, 2000).

**Gender Differences, Essay Length, and Writing Performance**

Several studies have found a relationship between gender difference and writing quality; however, the findings largely indicate mixed results depending on the writing task and topic. Researchers have found that boys rating their confidence in their writing abilities higher than their female counterparts, although actual performance on expository writing tasks did not differ (Klassen, 2002). This finding was consistent with previous studies conducted by Pajares and Johnson (1996) and Pintrich and DeGroot (1990), in which school-age boys rated their own confidence toward writing tasks higher than the school-age girls in the study; however, neither of the studies found gender differences in regard to writing quality on the writing tasks themselves. An additional study conducted by Pajares and Valiante (1999) found no significant differences regarding writing performance, yet both the boys and girls in the study rated the girls as “better writers” than boys. Thus, although confidence in the writing tasks did not differ, perceived competence for writing as a domain was higher for girls than for boys (Pajares & Valiante, 1999).

Studies on gender and writing have also revealed the tendency for girls to write more than boys (Malecki & Jewell, 2003; Swanson & Berninger, 1996). Results from a study conducted by Levine and Geldman-Casper (1996) indicated that female seventh grade students tended to write longer, more detailed essays that were of higher quality than their male counterparts on an informal science writing measure. Furthermore, the construct of essay length, measured by the total numbers of words in the essay, has consistently been related to essay
quality. A study conducted by Espin, De La Paz, Scierka, and Roelofs (2005) indicated that essay length was moderately correlated with the quality of the expository essays written by seventh and eighth grade students. In addition, De La Paz (2001) found that middle school students with ADHD wrote low quality essays that were short in length and in which essential argumentative essays elements were frequently omitted. In sum, research within the area of gender, length, and writing performance have shown a girls tend to write longer essays than boys, and that length has a positive association to essay quality. However, other studies have shown that males and females do not differ on their writing performance (Klassen, 2002; Pajares & Johnson, 1996; Pintrich & DeGroot, 1990). More research needs to be conducted in the area of gender and writing performance, particularly within the genre of argumentative writing, to further understand the impact of gender on writing performance.

Native Language and Writing Performance

Differences for native language and non-language speakers for acquiring language skills have also been recognized (Carrell & Connor, 1991; Hedgecock & Atkinson, 1993). In a recent study conducted by MacArthur, Konold, Glutting, and Alamprese (2010), a sample of 334 native English speakers and 154 non-native English speakers enrolled in adult basic education (ABE) were compared based on their reading components skills. Group comparisons found no difference between the native English speakers and non-native English speakers on word recognition, though the native English speakers scored higher on fluency and comprehension and lower on decoding non-native English speakers (MacArthur, Konold, Glutting, & Alamprese, 2010). This study expanded upon prior research on ABE learners conducted by Davidson and Strucker (2002), who found that native English speakers scored higher than non-native English
speakers on oral receptive vocabulary and silent reading comprehension tasks; however, both groups exhibited comparable word recognition and decoding skills.

Less attention has focused on the unique comparison of writing skill (rather than reading ability) among native English and non-native English speakers. In addition, most research conducted within the area of writing and native language focuses on use of the native language in writing, as opposed to a comparison of the writing skills of native-English speakers and non-native English speakers. Friedlander (1990) found that non-native English speakers benefit more by using their native language to write about topics in which they have direct experience in their native language, based on a study of information generation. In addition, Wang and Wen (2002) studied the use of native language for writers who spoke Chinese as their dominant language. The researchers found that participants were selective in their use of their native language, and relied more on their native language in narrative writing tasks rather than in argumentative writing tasks. Wang and Wen (2002) also found that participants’ use of their native language decreased as their writing proficiency increased.

In a study examining native-English speakers and non-native English speakers (i.e, native speakers of Punjabi), Becker (2005) found that the non-native English speakers wrote short essays that were accurate at the sentence level, but included ideas that were less developed throughout the drafting process than essays composed by native-English speakers. Coleman and Goldenberg (2011) found that both native English and non-native English speakers benefit from explicit instruction in literacy components, including phonological and phonics skills, vocabulary development, and narrative as well as expository writing. However, many teachers of struggling non-native English speakers avoid teaching and requiring students to write analytical essays because they believe the skills required are too sophisticated for the populations they serve.
(Olson, Land, Anselmi, & AuBuchon, 2010). Given that the total number of non-native English speakers is a rising population in the American public school system (i.e., more than 4.5 million students or 9.6% of the total population (Schulz, 2009)), more research is needed to identify specific writing needs of non-native English speakers in comparison to native-English speakers.

**Status of Writing Proficiency for Secondary Students**

Many adolescents nationwide are still struggling to become proficient writers, which inevitably has effect on these students’ performance in college. The results from the 2002 National Assessment of Educational Progress (NAEP) writing exams indicate that an overwhelming 70% of students in grades 4-12 were found to be low-achieving writers (Persky et al., 2003). This NAEP exam, which measured the writing skills of 4th, 8th, and 12th grade students, revealed that 72% of the 4th-grade students, 69% of 8th grade students, and 77% of the 12th grade students did not adequately satisfy NAEP’s writing proficiency goals (Persky et al., 2003). More so, three out of every four 4th, 8th and 12th grade student demonstrated only partial mastery of the writing skills and knowledge needed at their respective grade levels. Results from the more recent 2007 NAEP writing exams, which assessed 8th and 12th grade students nationally, showed slight improvements from previous assessments in 2002 and 1998. These increases were seen since 2002 in percentages of students performing at or above the Basic achievement level but not at or above Proficient (Salahu-Din, Persky, & Miller, 2008).

Many students who graduate from high school are unprepared to write at the basic level required by colleges and employers (Graham & Perin, 2007a). McCabe (2003) reported that only 59% of those who enter ninth grade eventually enroll in college, with only 42% of students graduating with the academic skills required for postsecondary work. Approximately one third of
high school students who intend to matriculate in postsecondary education do not meet the readiness benchmarks for college-level English composition courses, and approximately 50% or more of adolescents from various ethnic groups do not meet these ACT (2002) readiness benchmarks. Without mastery of basic writing skills, student learning at the post-secondary level will be less effective (Graham & Perin, 2007b).

**Implications for Status of Writing Proficiency of Secondary Students**

The current implications of poor academic performance and deficits in literacy skills across the United States are immense. For example, students who are in the bottom quartile of achievement are 20 times more likely to dropout of high school than students in the top quartile (Carnevale 2001; Kamil 2003; Snow & Biancarosa 2003). Notably, each school day approximately 7,000 young people drop out of high school (Biancarosa & Snow, 2006). In regard to juvenile system, one-third of all juvenile offenders read below the 4th grade level and about two-thirds of prison inmates are high school dropouts (Western, Schiraldi, & Zeidenberg, 2003). For those individuals who do graduate from high school, almost 40% of these graduates lack the reading and writing skills that employers seek, and almost a third of high school graduates who enroll in college require remediation (Carnevale & Derochers, 2003).

Economically, businesses, universities, and commercial agencies lose approximately $16 billion annually in lost productivity and remedial costs due to basic skill deficits (Greene, 2000). According to the National Commission on Writing (College Board, 2004), writing remediation itself costs American business as much as $3.1 billion annually; approximately half of private employers as well as more than 60% of state government employers report that writing skills impact promotion decisions (College Board, 2004; 2005). A reported 35% of high school
graduates in college and 38% of high school graduates in the workforce feel their writing does not meet expectations for quality (Achieve, Inc., 2005). Indeed, the consequences of poor writing proficiency on both individuals and society have reached substantial proportions.

**Status of Postsecondary Writing Proficiency and the Role of Community Colleges**

Many academically underprepared students who do pursue higher education enroll in community colleges (Calcagno,Crosta, Bailey, & Jenkins, 2007; Perin, 2006; Southard & Clay, 2004). Nationally, approximately 40% of entering community college students enroll in at least one developmental education (also known as remedial) course (Shults, 2000; Lewis & Farris, 1996). Another study approximated that one quarter of new community college students matriculate in remedial writing courses (National Center for Education Statistics, 2003); however, this statistic may actually be an underestimation, as the number of students who do need help with writing may not be enrolled in remedial courses (Perin, 2006).

Community colleges hold an important role in the American educational system, and provide an opportunity for a vast student population to engage in higher education. As such, the existence and outcomes of community college remedial programs play a key role in the United States’ ability to achieve educational access and equity goals (Perin & Charron, 2006). Many academically underprepared students tend to come from low-income households (Cohen & Brawer, 2003), and the community college is currently the only public postsecondary institution that guarantees admission to academically underprepared applicants (Perin & Charron, 2006). Community colleges have historically adopted an open access enrollment policy, which states that “all individuals, regardless of their academic preparation or other characteristics such as race, gender, or age, have the opportunity to participate in higher education” (Crews & Aragon, 2007, p. 637). Given the statistics that many community college students are unprepared to
engage in postsecondary level work, effective remediation programs at community college are essential for increasing low-income, academically unprepared students’ chances of postsecondary graduation (Perin & Charron, 2006). Thus, the need to better understand the writing skills of high school graduates, and to research, develop, and implement effective remedial practices for postsecondary students is all the more pressing for those at the community college level.

**Purpose of the Study**

The current study was conducted to extend previous research on argumentative writing and to examine an under-researched population, community college remedial students, who are at present a growing population in the U.S. (Perin, 2003). This study investigated key aspects of argumentative writing, including the number of functional argumentative elements in the essay, coherence, and cohesion, as measured by the writer’s skillful use of lexical cohesive ties. The term “cohesive ties” (De La Paz, 1995) was employed in this study to refer to the writer’s use of lexical cohesive ties. The current study also investigated to what extent these aspects contribute to the overall quality of argumentative essays written by community college remedial students. In addition, the study investigated the possible impact on writing performance of key demographic variables of the writer, i.e., reading ability, science knowledge, science interest, gender, and native language.

Archival data collected in Fall 2007 were obtained from a federally funded intervention study directed by Dolores Perin at Teachers College, Columbia University. As a supplement to ongoing reading and writing curriculum, the participants in this study completed ten instructional units that comprised the “Comprehension Content Strategy Intervention” (CCSI). Each intervention unit required completion of a series of reading and writing tasks, including a
simplified argumentative writing task involving the statement of an opinion on a controversial topic. Each reading passage was on a science topic, and the prompts for the argumentative essays were written to relate in some way to the content of the reading passage.

**Research Questions**

The current study addressed two research questions:

(1) To what extent are the argumentative essays written by community college remedial students inclusive of argumentative elements, coherent, cohesive, and of high quality?

(2) To what extent do the written components of the argumentative essays (i.e., inclusion of functional elements, coherence, cohesion, length) and the demographic characteristics of the writer (i.e., reading ability, science interest, science knowledge, gender, native language) contribute to overall the quality of the argumentative essays?

It was hypothesized that the argumentative essays written by remedial community college students would include few argumentative elements and cohesive ties, lack coherent organization, and would be of low quality. Based on prior research into the writing of low-achieving students, it was also hypothesized that the number of functional argumentative elements, level of coherence, use of cohesive ties, and length would significantly predict the quality of the essays written by the community college remedial students. Lastly, it was hypothesized that reading ability, science knowledge, science interest, gender, and English as a native language would significantly contribute to the overall quality of the essays. Writing quality was defined as the development and elaboration of the essay, taking into account the
persuasiveness of the essay, i.e., the effectiveness of the paper in its ability to influence readers about the need to take some action, or to change their thinking about a controversial issue, as well as the general organization and coherence of the essay. Of note, there is not control group in this study. The purpose of the study is to characterize the writing skills of a group of students who are typical of the large population of low-achieving students entering community colleges in the United States. The study utilizes a comprehensive framework to arrive at a thorough description of the writing in one genre of a single group of learners, and also investigates the possibility of demographic and academic predictors to explain the pattern of writing performance.
Chapter II

METHOD

Participants

The participants were drawn from a sample of $N=148$ students attending six sections of developmental reading and writing courses in an urban community college during the Fall 2007 semester. Participants were selected for the present study if they had demographic information on gender, ethnicity, and native language, and pretest scores for the Nelson-Denny Reading Test \cite{BrownFishcoHanna1993}, Science Knowledge Test, and Science Interest Inventory, and an argumentative writing sample from CCSI Unit 1. Of the 148 participants, 112 participants completed both the pretests and the argumentative writing task assigned in the first of ten units in the intervention. Inconsistent attendance and participation is common in this low-achieving population \cite{CohenBrawer2003}.

The sample of $n=112$ students consisted of 54% females and 46% males. Forty-six percent of the sample population were Hispanic, 25% Caucasian, 13% Asian, 4% African American, and 12% of students were of other ethnicities not specified. The majority of students (i.e., 94%) were between the ages of 18 and 22 years old; approximately 1% of the students were between the ages 16-17 years old, 3% were between 23-29 years old, and 2% were between 30-66 years old. All participants were considered by the college to have a level of fluency in the English language that permitted them to benefit from remedial instruction, although some had a native language other than English. Seventy-two percent of the students were native English speakers and 28% were non-native English speakers (see Table 1).
Materials

Measure of Reading Ability

Reading ability was measured using the Nelson-Denny Reading Test (Brown, Fishco & Hanna, 1993), a standardized instrument consisting of vocabulary and reading comprehension subtests. The vocabulary subtest is a multiple-choice test consisting of 80 items, and the reading comprehension section consists of seven passages followed by 38 multiple-choice options. The vocabulary and comprehension subtest scores can be combined to yield a total score. The Nelson-Denny Reading Test is normed on both high school and college students with internal consistency estimates of 0.89, 0.81, and 0.90 for Vocabulary, Comprehension, and Total Test Score, respectively. Reliability and validity scores were not reported (Murray & Smith, n.d.). It is noted that after the data were collected in 2008, it was suggested that the comprehension subtest has poor content validity (Coleman, Lindstrom, Nelson, Lindstrom & Gregg, 2009); at the same time, the Nelson-Denny Reading Test remains a widely used assessment, especially with college populations.

Measure of Science Interest

The Science Interest Inventory measured the extent to which participants enjoyed learning about science. This measure was developed by Professor Linda Mason at Pennsylvania State as part of the study from which the writing data in the current study were drawn. The science interest measure is an adaption of The Motivation for Reading Questionnaire (MRQ, Wigfield & Guthrie, 1997). The MRQ was originally intended to measure reading motivation for students in the upper elementary and middle school grades, but has been modified to assess other academic variables such as writing (Harris, Graham, & Mason, 2006). Based on the MRQ,
the Science Interest Inventory (SII), contains 10 Likert-type items, each on a 4-point Likert scale: (1) very different from me, (2) different from me, (3) like me, and (4) a lot like me (maximum score = 40). The participants were directed to read a statement and select a dimension on the scale that best represented how they felt. An example of an item is: “I enjoy learning about different science topics.” The mean score of the 112 students in the current study, was a 27.23 and the standard deviation was 5.03 (range 11-40). The internal consistency reliability as measured by Cronbach’s alpha was $\alpha=0.84$.

**Measure of Science Knowledge**

The Science Knowledge test, which measured prior knowledge of the science material used in the intervention, was also developed by Professor Linda Mason. The measure consisted of 20 multiple-choice questions based on the text used in the intervention (two items per reading passage). Two multiple-choice questions were selected from a passage in each of the ten units to form a total of twenty multiple-choice questions. Each question corresponded with four responses. An example of a test question was, “All matter has: (a) volume and mass, (b) mass and energy, (c) volume and energy, (d) volume, mass, and energy”. An English professor not connected to the study reviewed the content for coherence and suitability, and the test was further revised after feedback was received by two adults with community college associate degrees. Among the current 112 participants, the mean score was 10.64 (SD = 2.71), with a range from 3-18 correctly answered questions. The scores were normally distributed but the internal consistency reliability was relatively low for this knowledge measure (Cronbach’s $\alpha$ of 0.46). It is plausible that this relatively low internal consistency rating may be attributed to varying range of knowledge on the ten topics represented in the survey rather than the internal consistency of the measure itself.
Demographic Information

Information on race, age, gender and native language was provided by the colleges’ institutional research offices (see Table 1 for descriptive information).

Argumentative Writing Task

The data for the present study consists of writing samples from the argumentative essay task in the first instructional unit of the CCSI project. The prompt was: “Organic food is grown without pesticides. Some people like it because they think it is healthy. However, it can be expensive. What is your opinion of organic food? State your opinion. Give one reason, and at least three supporting details for your reason”. The instructions stated, “Write one or two paragraphs below, in full sentences. Use your own words!”. The directions also indicated that if the topic was unfamiliar, the students could ask someone they knew for information or look up the topic online. However, the students were directed to write the essay independently (see Appendix A).

The prompts can be described as a simplified argumentative essay task since instructions did not direct students to include a counterargument or rebuttal as would be done if a full argumentative essay structure were required (De La Paz, 2005; Ferretti et al., 2009). The reason for reducing task demands was that preliminary data collection and discussion with course instructors in the project from which the archival data are drawn indicated that many students were unable to write a full argumentative essay. Therefore, an essay only requiring the statement of a position, a reason, and supporting detail for that reason was assigned. This assignment was consistent with prior research with younger samples in which students were provided with brief background information on a controversial topic and asked to write an essay expressing their opinion (Nussbaum & Schraw, 2007; Wong, Butler, Ficzere, & Kuperis, 1996).
Quality of Argumentative Essay

The writing quality of argumentative essays have predominantly been assessed by holistic scoring rubrics (Nussbaum & Schraw, 2007; Monroe, & Troia, 2006; Sawyer, Graham, & Harris, 1992), in which aspects of coherence, cohesion, and inclusion of argumentative elements are taken into consideration to determine the overall persuasiveness of the essay (Ferretti et al., 2009; Nussbaum & Schraw, 2007; Nussbaum & Knudson, 2005). Given that holistic measures incorporate an element of subjectivity (Todd, Thienpermpool, & Keyuravong, 2004; Janopoulos, 1991; Bamberg, 1982), it is plausible that an essay’s “true” score may differ from the rated score, despite moderate to strong inter-rater reliability. The presence of specific, criteria-based descriptors aims to limit subjectivity and increase the efficacy of holistic scoring rubrics (Weir, 1990).

Following the assessment framework of Ferretti et al. (2009), Nussbaum and Schraw (2007), and Ferretti et al. (2000), a scoring rubric ranging from 0 to 7 was used to judge overall quality of the argumentative essays in this sample. The quality measure was adapted by the current author to accommodate the specific tasks of the writing prompt; detailed explanation of the adaptations is provided below. This measure of quality took into account the overall development and elaboration of the essay. The persuasiveness of the essay, defined as its potential to influence readers to take some action or change their thinking about a controversial issue. The rubric considers whether the written argument includes a clear opinion about the topic, provides one or more reasons for the opinion, includes an elaborated reason i.e., reason with supporting details, and addresses the opposing position.

One of author’s main adaptation to the original scoring rubric used by Ferretti et al. (2009), Nussbaum and Schraw (2007), and Ferretti et al. (2000) was that the descriptor labels
and definitions for each level of the rubric were tailored to represent the explicit demands of the writing prompt. As noted, the essay prompt for this study explicitly called for the writer to provide an opinion, a reason for the opinion, and three supporting details in the essay; as such, the inclusion of these elements represents a developed argumentative essay. The inclusion of additional argumentative elements (such as counterarguments and rebuttals) reflect the writer’s enhanced awareness of argumentative discourse and are scored to indicate a well developed and highly developed argumentative essay, if present. In addition, scoring guidelines (Appendix C) were developed based on use in previous argumentative writing studies (Ferretti et al., 2009; Nussbaum & Schraw, 2007; Ferretti et al., 2000; Sexton, Harris, & Graham, 1998; De La Paz; 1995). Sample essays derived from the author’s study pilot study served as “anchor essays” for the guidelines and provided raters with examples of essays scored at each rating on the quality of the argumentative essay scale.

In addition, the author adapted the present quality measure by expanding the “3” and “5” numbered levels to include detailed descriptions of the scoring criteria. For example, a score of 3 in the original scoring rubric stated, “Between the standards for 2 and 4”. The author altered this description to provide a clearer demarcation between the two scores in order to warrant a score of 3. The wording for the “3” criteria in the current measure incorporates the descriptions of a 2 and 4 score: “Paper states a clear opinion and gives a reason and some detail for the reason. The supporting details only somewhat explain or elaborate upon the reason, and may contain some inconsistencies, irrelevant or unsupported information.” Further, the score of 3 takes into account the directions in the argumentative writing prompt and outlines the specific criteria for a “partially developed” paper: Thus, the description for a score of 3 also states: “Paper includes one reason and partially explained detail (e.g., two or fewer details) and/or
unclear elaborations”. Similar procedures were followed for a score of “5”. The rationale for providing a thorough description of each level of the scoring rubric was to limit the ambiguity of the scale, and to connect the scoring ratings with the specific task of the prompt.

Elements of Argumentative Discourse

The essays were rated for elements of argumentative discourse, which include the standpoint, reasons for the standpoint, elaborations for the standpoint and reasons, alternative standpoints, reasons for the alternative standpoints, rebuttals, concluding statements, introductory statement, functional markers, and nonfunctional elements (see scoring procedures below and Appendix D for more detail for on identifying elements of argumentative discourse in the essays, as well as Appendix E for specific procedures for graphing elements of argumentative discourse). To reach the score, the contents of each essay are depicted in a diagram. This process is referred to as “graphing” (Ferretti et al., 2009). After each element was graphed according to the graphing manual described in Appendix E, the elements were tallied by counting the number of elements present in the graphing structure for each element of argumentative discourse (see score sheet, Appendix F).

Coherence Scale

A Coherence Scale was developed by the current researcher for the study, adapted from De La Paz’s (1995) Holistic Coherence Scale, to assess the extent to which the ideas expressed in each essay were coherently organized (see Appendix G). A thorough search for coherence scales conducted in preparation for this study found a shortage of scales relevant to the current questions and dataset. De La Paz’s (1995) Holistic Coherence Scale, although dated, was selected as the one with the best fit to the writing samples being analyzed. In the present study,
De La Paz’s (1995) single Holistic Coherence Scale was adapted into two subscales, i.e., the Coherence Scale and the Cohesion Scale, to directly assess these distinct components. The author refined the Coherence Scale (originally labeled as the Coherence-Organization in De La Paz’s study) by adding a relevant sub-descriptor for the score of 1, as described below. In addition, the present author switched the order in which the scale described the single and multiple arguments criteria for level rating; given that most of the argumentative essays in the sample included only one argument, it was most practical to present the criteria for a single argument first, followed by the coherence criteria for multiple arguments. Sample papers derived from the author’s pilot study, which utilized the same argumentative writing prompt, were provided with the measure in order to serve as guiding examples of essays at each level of the scale.

The Coherence Scale, which ranged from 0 to 3, measures whether the writer organized his or her ideas according to an overall plan and integrates them into a coherent whole. A score of 3 indicates that the essay is completely organized according to a plan that is sustained throughout the essay. Structure and unity among ideas is strongly evident with no wandering from the primary theme or plan, and the topic and concluding sentence support each other. A score of 3 is also earned if the student considers two sides to an issue by stating the topic, giving support, considering an opposing view, and explicitly rejects at least one opposing reason, plus ends with the same premise. A score of 2 indicates that the essay is fairly well organized, with little digression of plan and has a clear flow of ideas throughout essay. An essay earned a score of 2 if the student’s premise, i.e., standpoint, is logically modified from the topic sentence to the conclusion and/or if the student considers two sides of an issue by stating the topic, support, considering an opposing view, but does not explicitly reject an opposing view.
As De La Paz originally noted, a score of 1 is given when (a) the writer considers two sides but goes back and forth from one side to another, and does not refute the last argument by the end of the essay, or (b) the writer shifts his or her premise from one side to the other, has redundant ideas, and/or lacks a clear flow of ideas. In alignment with these criteria, the present author added a description for a score of 1, stating (c) the writer includes inconsistent or incongruent information and does not clarify the argument(s) or discrepancies in the essay. This additional description was added since many of the argumentative essays included inconsistent information for their single arguments. Lastly, an essay is scored a 0 if the writer either lists ideas or digresses substantially from topic sentence.

The Coherence Scale measures to what extent the elements of argumentative discourse are presented logically by the writer and contribute in support of the writer’s premise, i.e., standpoint on organic food. Therefore, it is expected that there will be some overlap between the variables of coherence and number of the elements of argumentative discourse presented in the essay.

**Cohesion Scale**

The Cohesion Scale, also adapted from De La Paz’ (1995) Holistic Coherence Scale, was used to assess the skillful use of cohesive ties in the argumentative essays. De La Paz’s scale for cohesion (originally labeled as the Coherence-Linguistic Ties scale) ranges from 0-3, and was selected to measure to what extent the writer either over-or under-used cohesive markers to signal relationships between parts of his or her text. The scoring procedures for this scale are shown in Appendix H. The author refined the Cohesive Scale by adding relevant sub-descriptors for each level of the scale described below. As was done with the current Coherence Scale, the present author switched the order in which the scale described the single and multiple arguments
criteria for level rating. In addition, sample papers derived from the author’s pilot study were also provided with the cohesion measure in order to serve as guiding examples of essays at each level of the scale.

A score of 3 indicates that the writer skillfully used cohesive ties to link sentences together and connect flow of ideas through the use of transitions. There are very few or no errors of cohesive ties, in approximate proportion to the length of the essay. In order to further clarify a score of 3, the present author noted that the essay should include “varied use of cohesive ties and contains two or more cohesive ties, in approximate proportion to the length of the essay”. As in De La Paz’s original scale, a score of 2 indicates that the writer uses some cohesive ties to link sentences together. The essay contains a small number of errors that do not interfere with fluency (i.e., about one error for every two sentences is tolerated). For further clarification, present author added that a score of 2 should “contain at least one cohesive tie, in approximate proportion to the length of the essay”. Criteria for a score of 1 remained the same as in De La Paz’s original measure. A score of 1 indicates that the writer uses very few cohesive ties to link sentences together. Sentences may only be minimally linked together, and may contain several errors and lack control; up to one error per sentence is tolerated. Finally, for a score of 0, the present author altered the wording from “uses very few cohesive ties” to “uses no cohesive ties” in order to clearly differentiate between a score of 0 and 1. If cohesive ties are present, an essay may still warrant a score of 0 if “they are used incorrectly and contain errors that disrupt meaning or clarity of the sentence”, as was originally sated by De La Paz. Consistent with the original terminology, a score of 0 also indicates that the sentences do not seem connected or linked together.
In order to quantify terms such as “in approximate proportion to the length of the essay” and “very few cohesive ties”, the number of cohesive ties and the number of sentences written in the essay were counted. A general proportion score was generated by dividing the number of cohesive ties used by the number of sentences in the essay. Guiding parameters ranging from 0% of a cohesive ties percentage is used for a score of 0; greater than 0% to approximately 25% use of cohesive ties is used for a score of 1; approximately 30% to 50% use of cohesive ties is used for a score of 2, and greater than 50% use of cohesive ties is used for a score of 3. Use of varied cohesive ties and accurate use of the linguistic device is accounted for in the measure; therefore, the parameters listed above serve as a guide for quantifying subjective terms (i.e., “very few” and “approximate proportion to the essay length”) in order to reduce bias and enhance inter-rater agreement.

A list of common cohesive ties used in argumentative writing was provided for the raters to help identify the cohesive ties. The list, shown in Appendix I, was adapted from the De La Paz (1995) study, and included cohesive ties that served to introduce ideas. For example a cohesive tie that can be used to introduce an idea, as identified by De La Paz (1995) was “I believe that,” or “I think”. The present author also added the cohesive ties of “I think if”, “First thing”, and “My opinion” to this category, given the prevalence of these ties in the author’s pilot sample. Examples of cohesive ties, as identified from De La Paz (1995), that serve to add supporting ideas include, “A reason to support this is”, “for instance”, “for example”, “furthermore”, or “in other words”. Furthermore, examples of cohesive ties used to refute an earlier idea are “conversely”, “however”, “still”, “but”, “nevertheless”, or “on the other hand”, and examples of cohesive ties to show a conclusion or consequence are “for these reasons”, “therefore”, “it follows that”, “consequently”, “so as a result”, and “in conclusion”. Although this list is not
exhaustive of all the cohesive ties produced by students, it serves as a guiding reference of common cohesive ties used in argumentative essays (De La Paz, 1995).

**Scoring Procedures**

Based on methods used in previous studies (Ferretti et al., 2009; De La Paz, 2005; Harris, Graham, & Mason, 2006), the essays were typed and corrected for spelling prior to scoring in order to minimize possible rater bias associated with handwriting and spelling. Prior research has suggested that the appearance of text- or surface-level features, such as the legibility of handwriting and the number of spelling errors, can influence raters’ judgments of writing quality (Graham, 1990). There were many grammatical errors in the writing samples, characteristic of the quality of writing of low-achieving community college students, but grammar and punctuation was not corrected because it could not be guaranteed that the correction would adequately represent the writer’s intention. A detailed description of the scoring procedures for the holistic rating scales i.e., the Quality of Argumentative Essay, Coherence Scale, and Cohesion Scale, as well as the procedures for indentifying, graphing, and scoring the elements of argumentative discourse is provided below.

**Scoring and Training for Holistic Measures**

As noted, the present author scored all 112 of the essays using the holistic measures previously described. In order to determine inter-rater reliability, the present author trained a graduate student who had experience in administering and scoring writing assessments. This individual, referred to as the “second rater,” was unfamiliar with the design and purpose of the study. The second rater received training by the present author and then practiced using the holistic scoring measures in two 2-hour training sessions. The training included orientation to the
measures and preparation to use the anchor papers before the scoring essays in the present sample. Also, the author taught the second rater to identify the argumentative qualities of eight sample papers on the topic using the locally developed guide for identifying the elements of argumentative discourse shown in Appendix D. The second rater and the author discussed the ratings, and then the second rater proceeded independently to score another set of eight essays for additional practice for the holistic scoring. Following the training and practice, the second rater scored approximately 40% of the argumentative essays (n=45) in order to determine inter-rater reliability for the quality, coherence, and cohesion measures, as well as for number of words and number of cohesive ties present in the essays.

**Inter-Rater Reliability for Holistic Measures**

Previous studies of argumentative writing have calculated inter-rater reliability by dividing the total number of agreements by the total of agreements plus disagreements (Ferretti et al., 2009; Deatline-Buchman et al., 2006). However, this method does not take into account factors such as chance. In the present study, Cohen’s kappa statistic was used to determine inter-rater reliability since it adjusts the observed proportional agreement by taking into account the amount of agreement that would be expected by chance (Cohen, 1960). According to Landis and Koch (1977), a kappa value of less than 0.20 is considered to be “poor”, 0.21 to 0.40 is considered “fair”, 0.41 to 0.60 is considered “moderate”, 0.61 to 0.80 is considered “good”, and a kappa value of greater than 0.81 to 1.00 is considered to indicate “very good” inter-rater reliability.

The analysis of Cohen’s Kappa for the quality, coherence, and cohesion measure revealed that inter-rater reliability for these scales all fell within the “good” range: the kappa value was 0.71 for the quality measure, 0.75 for the coherence measure, and 0.63 for the cohesion measure.
In addition, the Cohen’s Kappa for number of words and number of cohesive ties counted in the essay were 0.95 and 0.65, which fall in the “very good” and “good” range, respectively. The kappa values were calculated on the individual scores of the two raters for each of the three holistic measures applied to the 45 essays; therefore, the kappa values were calculated prior to the raters settling any disagreements in scoring. All disagreements in scoring were settled through discussion between author and second rater in order to reach final and full agreement. Appendix J includes the Cohen’s Kappa coefficients for this study, as well as the Intraclass Correlation Coefficients (ICC).

**Graphing and Scoring of Elements of Argumentative Discourse**

The procedure for analyzing the argumentative elements and corresponding structures in the argumentative essays was based on the work of Lewis and Ferretti (2010), which outlined the guidelines for the graphing and scoring procedures of argumentation development used in the Ferretti, Lewis, and Andrews-Weckerly (2009) study. These scoring procedures for graphing argumentation development were grounded in the *pragma-dialectical theory* of argumentation (van Eemeren & Grootendorst, 1992, 2004; van Eemeren et al., 2002), which was summarized in the introduction chapter in this dissertation.

The present author received training in the graphing and scoring method from the researchers who originally designed it, Professors Ralph Ferretti and William Lewis of the University of Delaware. The innovation in their procedure is the customization of scoring expressly to the prompt administered. Further, their method reflects a theory of how argumentative writing should be structured (van Eemeren & Grootendorst, 1992, 2004; van Eemeren et al., 2002). Using the graphing guidelines presented in Lewis and Ferretti (2010) and the scoring method of Ferretti, Lewis, and Andrews-Weckerly (2009), the elements of each essay
were graphed and scored, and were represented in a visual framework that is similar to a graphic organizer. The visual framework depicts the elements that are present in an ideal structure of argumentative writing. A description of the training and scoring measures for graphing argumentative elements is provided below.

The graphing and scoring training provided by Professors Ferretti and Lewis to the present author consisted of two 6-hour training sessions at their university. As part of the training, the present author practiced on 12 essays written to the organic food prompt. After graphing and scoring the 12 practice essays, the author received corrective feedback from Professors Ferretti and Lewis, and then practiced independently on another set of 26 essays to meet a criterion they set. This criterion was such that inter-rater agreement, as measured by the number of agreements divided by the number of agreements and disagreements, was within one unit. Based on the work of Lewis and Ferretti (2010) and Ferretti, Lewis, and Andrews-Weckerly (2009), the present author then devised the locally adapted Guidelines for Identifying Argumentative Discourse (Appendix D) and the Scoring Manual for Graphing Argumentative Discourse (Appendix E) using the graphical representations derived from the practice essays for the organic food prompt.

These locally adapted documents provided examples and scoring guidelines specific to the argumentative writing prompt on organic food, and allowed for the distinction among the argumentation elements and the relationship among these elements. A set of rules was identified to distinguish between the superordinate and subordinate relationships among the elements in the argumentative structure (Lewis & Ferretti, 2010; Ferretti et al., 2009; van Eemeren & Grootendorst, 1992; van Eemeren et al., 2002). The discourse markers (van Eemeren et al., 2002) provided information regarding the relationship between the argumentative structure and
the elements. After training for the author was complete and the tailored scoring manual as well as guidelines for identifying argumentative discourse were locally adapted based on the steps outlined in Lewis and Ferretti (2010) and Ferretti et al. (2009), the present author conducted a pilot study by graphing and scoring a set of 42 essays on the organic food prompt. Finally, the author graphed and scored all 112 essays for the current study.

The following procedures, taken from Ferretti et al. (2009), were used to graphically represent the structure of the arguments presented in the writing samples: (a) identify the student’s standpoint(s), (b) identify the student’s reasons to support for the standpoint, and (c) distinguish between reasons offered as direct support for the standpoint, which are known as Level 1 reasons, versus reasons subordinate to Level 1 that are offered as support for reasons above it. Furthermore, it was important to (d) identify alternative standpoint(s), which are standpoints of other people that the student disagrees with, (e) identify reasons for the alternative standpoint, (f) distinguish between reasons offered as direct support for the alternative standpoint versus reasons subordinate to Level 1 that are offered as support for reasons above it, (g) identify counterarguments that could be used to object to or undermine the student’s standpoint, which are potential criticisms of either the student’s standpoint or reasons for the student’s standpoint that could be used to enhance the alternative standpoint, (h) identify rebuttals of the alternative standpoint, which are propositions that either attack an alternative standpoint or undermine counterarguments and thereby strengthen the student’s standpoint, (i) identify an introduction that foreshadows what is to follow in the student’s presentation of the argument, (j) identify a conclusion that brings together or summarizes what the student has written, (K) identify functional markers, including rhetorically functional repetitions, that serve a particular purpose for the writer, and (l) identify nonfunctional statements that include information that is irrelevant
to the topic.

Figure 2 represents the graphical structure of a well-developed argumentative essay written by a community college student in the current sample.
Figure 2.

*Graphical representation of the structure of an argumentative essay written by a community college student in current sample.*

“Organic food is a healthy option for every person. Since organic food have no chemicals and is natural it helps on weight and healthy problems. It might be expensive but in my opinion it is worth it. Organic food is fresh and it has a better taste. For example the meat has no chemicals and is fresh. When you eat fresh meat you can easily notice the difference because it has a better texture and it even look more appetizing.”

*Note.* SP1 = Standpoint 1; R1 = Reason 1; R2 = Reason 2; R1a = Reason 1, $1^{\text{st}}$ coordinating string; R1b = Reason 1, $2^{\text{nd}}$ coordinating string; R1c = Reason 1, $3^{\text{rd}}$ coordinating string; R1d = Reason 1, $4^{\text{th}}$ coordinating string; CA1 = Counterargument1; RB1 = Rebuttal 1; R2a = Reason 2, $1^{\text{st}}$ coordinative string; R2b = Reason 2, $2^{\text{nd}}$ coordinative string; CA = Counterargument; RB = Rebuttal
The structure from Figure 2 reveals that the student offered one standpoint, otherwise known as the author’s opinion, on organic food. At Level 1, the writer provides four reasons for the standpoint; these reasons are presented as two multiple arguments with 2 supporting details i.e., two coordinating elements in the reason. The Level 1 reasons are directly supported by six subordinating reasons, i.e., reasons below Level 1. The writer also provides a counterargument for the reasons, as well as a rebuttal for the counterargument in order to strengthen the writer’s stance. Lastly, the writer includes one rhetorically functional repetition in the essay. As seen in Figure 1, this essay contains 14 functional elements: one standpoint, four Level 1 Reasons, six reasons below Level 1, one counterargument, one rebuttal, and one rhetorically functional repetition. There are no nonfunctional elements present in the essay.

**Inter-Rater Reliability for Elements of Argumentative Discourse**

In order to establish the inter-rater reliability for graphing and scoring elements of argumentative discourse, the present author trained a doctoral-level psychologist, referred to as the “third rater”. This rater was not employed in the pilot study, and was not the same person as the “second rater” for the holistic measures. As such, the third rater was unfamiliar with the purpose of the study and did not have prior knowledge on how to graph and score the argumentative essays for elements of argumentative discourse.

The locally adapted graphing manual for scoring the argumentative essays (Appendix E) was provided for the third rater to use during scoring. The graphing manual included elements from sample essays that illustrated the structural relationships among argumentative elements, as well as guidelines for identifying elements of argumentative discourse that highlighted the main components for graphing and scoring, i.e., numerically counting, the argumentative elements. The third rater was trained in the graphing and scoring of the essays following a similar
procedure as the author; practice for this rater was conducted a total of 18 essays that were not included in the graphing manual or in the current sample. The rater first practiced on a set of 9 essays, and then discussed and evaluated the essays with the author. A second set of 9 essays was assigned for the writer to score independently, and then the rater and present author discussed the graphical representation and scoring. The third rater then scored approximately 40% of the argumentative essays (n=45) in the current sample in order to determine inter-rater reliability for identifying elements of argumentative discourse.

As described above for the holistic measures, Cohen’s Kappa was used to calculate the level of inter-rater reliability for identifying elements of argumentative discourse (see Appendix J). The analysis of the respective kappa values below indicated “good” inter-rater reliability among the majority of the argumentative elements. The argumentative elements that fell within the “moderate” range for inter-rater reliability included identification of reasons below Level 1 for the author’s standpoint, and reasons for the alternative standpoints, elaborations of counterarguments, rebuttals, and elaboration of rebuttals. A possible reason for this “moderate” reliability is due to the vast array of reasons below Level 1 present in the argumentative essays, and the relatively infrequent presence of reasons for the alternative standpoint the essays, elaborations of counterarguments, rebuttals, and elaboration of rebuttals.

The specific Kappa values for the “myside” functional elements of argumentative discourse was as follows: author’s standpoint(s) = 0.79; Level 1 reasons for author’s standpoint(s) = 0.64; and reasons below Level 1 for author’s standpoint(s) = 0.59. The Cohen’s Kappa for the “yourside” functional elements of argumentative discourse was: alternative standpoint(s) = 0.67; Level 1 reasons for alternative standpoint(s) = 0.49; counterarguments = 0.75; elaboration of counterarguments = 0.48; rebuttals = 0.60; and elaboration of rebuttals =
In addition, the Cohen’s Kappa for the “extra” functional elements of argumentative discourse was: introductions = 0.74; conclusions = 0.76; titles = 0.67; functional markers = 0.77, and rhetorically functional repetitions = 0.67. The Cohen’s kappa for nonfunctional elements was 0.62. Differences in the structural analyses of the two raters were reconciled through discussion, yielding a final structure from which the elements of argumentative discourse were tallied. Appendix J also includes the Intraclass Correlation Coefficients (ICC) for the argumentative elements.

**Data Analysis**

A one group within subjects design (Shadish, Cook & Campbell, 2002) was employed for the study. To address the first research question, “To what extent are the argumentative essays written by community college remedial students inclusive of argumentative elements, coherent, cohesive, and of high quality?”, descriptive statistics for each outcome variable were conducted. To answer the second research question, “To what extent do the written components of the argumentative essays (i.e., inclusion of functional elements, coherence, cohesion, and length, contribute to overall quality of the argumentative essays) and the demographic characteristics of the writer (i.e., reading ability, science interest, science knowledge, gender, and native language) contribute to overall quality of the argumentative essays?”, an ordinal logistic regression analysis was conducted.

As previously mentioned, the four predictor variables relating to the essays’ written components included: (a) the number of functional argumentative elements in the essays, (b) the essays’ level of coherence, and (c) the essays’ level of cohesiveness, as measured by use of cohesive ties, and (d) essay length, as measured by number of words. In addition, the five predictor variables for the demographic characteristics of the writer included: (a) reading ability,
(b) science interest (c) science knowledge, (d) gender, and (e) native language. All nine predictor variables were included in the ordinal logistic regression model in order to address the second research question. The outcome variable for this model was the quality of the argumentative essays, measured using a holistic writing rubric.

Inter-correlations were calculated among the functional elements, nonfunctional elements, coherence, cohesion, length of essay, and quality of essay, as well as among reading ability, science interest, science knowledge, gender, native language and quality of essay to further assess for the relationship regarding the writer’s written components of the essay, demographic characteristics and overall writing performance.
CHAPTER III

RESULTS

Participant Characteristics

Table 1 shows the descriptive statistics for the 112 participants on reading ability, science interest, science knowledge, gender, language status and race/ethnicity. Skew and kurtosis statistics were computed for the continuous variables.

Table 1

Demographic Characteristics of the Sample (n=112)

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<td>72%</td>
<td>0.45</td>
<td>0-1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latino/Hispanic</td>
<td>52</td>
<td>46%</td>
<td>0.50</td>
<td>0-1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Black/African American</td>
<td>3</td>
<td>3%</td>
<td>0.16</td>
<td>0-1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Asian</td>
<td>15</td>
<td>34%</td>
<td>0.34</td>
<td>0-1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>White</td>
<td>28</td>
<td>25%</td>
<td>0.44</td>
<td>0-1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>12%</td>
<td>0.33</td>
<td>0-1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Ability</td>
<td>112</td>
<td>68.27</td>
<td>23.1</td>
<td>21-135</td>
<td>0.33 (0.23)</td>
<td>0.07 (0.45)</td>
</tr>
<tr>
<td>Science Interest</td>
<td>112</td>
<td>27.23</td>
<td>5.03</td>
<td>11-40</td>
<td>-0.11 (0.23)</td>
<td>0.45 (0.45)</td>
</tr>
<tr>
<td>Science Knowledge</td>
<td>112</td>
<td>10.57</td>
<td>2.70</td>
<td>3-17</td>
<td>-0.04 (0.23)</td>
<td>-0.33 (0.45)</td>
</tr>
</tbody>
</table>

Note. ( ) = Standard Error

Question 1

Descriptive statistics for each outcome variable were obtained in order to answer the first research question, “To what extent are the argumentative essays written by community college
remedial students inclusive of argumentative elements, coherent, cohesive, and of high quality?”. These data are shown in Table 2 and Table 3.

Table 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Ranges</th>
<th>Maximum Score</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coherence</td>
<td>1.79</td>
<td>0.83</td>
<td>0-3</td>
<td>3</td>
<td>0.02</td>
<td>-0.86</td>
</tr>
<tr>
<td>Cohesion</td>
<td>1.63</td>
<td>0.92</td>
<td>0-3</td>
<td>3</td>
<td>-0.03</td>
<td>-0.77</td>
</tr>
<tr>
<td>Quality</td>
<td>3.18</td>
<td>1.40</td>
<td>0-7</td>
<td>7</td>
<td>0.04</td>
<td>0.11</td>
</tr>
<tr>
<td>Number of Cohesive Ties</td>
<td>1.91</td>
<td>1.28</td>
<td>0-5</td>
<td>Unlimited</td>
<td>0.57</td>
<td>-0.20</td>
</tr>
<tr>
<td>Length of Essay (Number of Words)</td>
<td>98.2</td>
<td>46.73</td>
<td>25-264</td>
<td>Unlimited</td>
<td>1.32</td>
<td>2.04</td>
</tr>
</tbody>
</table>

| Elements of Argumentative Discourse     |      |      |        |                |       |          |
| “Myside” functional elements            |      |      |        |                |       |          |
| Author’s standpoint(s)                  | 7.01 | 4.02 | 0-23   | Unlimited      | 1.32  | 2.78     |
| Level 1 reasons for author’s standpoint(s) | 1.01 | 0.21 | 0-2    | Unlimited      | 0.83  | 20.28    |
| Reasons Below Level 1 for author’s standpoint(s) | 2.31 | 1.75 | 0-11   | Unlimited      | 1.73  | 5.01     |
| “Yourside” functional elements          |      |      |        |                |       |          |
| Counterarguments                        | 1.71 | 2.03 | 0-8    | Unlimited      | 0.96  | 0.06     |
| Elaboration of counterarguments         | 0.77 | 0.92 | 0-3    | Unlimited      | 0.98  | -0.03    |
| Rebuttals                               | 0.01 | 0.09 | 0-1    | Unlimited      | 10.58 | 112      |
| Elaboration of rebuttals                | 0.67 | 0.89 | 0-4    | Unlimited      | 1.40  | 1.64     |
| Alternative standpoint(s)               | 0.21 | 0.69 | 0-3    | Unlimited      | 3.21  | 9.19     |
| Level 1 reasons for alternative standpoint(s) | 0.01 | 0.09 | 0-1    | Unlimited      | 10.58 | 112      |
| “Extra” functional elements             |      |      |        |                |       |          |
| Introduction (0 or 1)                   | 1.02 | 1.02 | 0-5    | Unlimited      | 1.41  | 3.05     |
| Conclusion (0 or 1)                    | 0.28 | 0.45 | 0-1    | 1              | --    | --       |
| Title (0 or 1)                          | 0.4  | 0.49 | 0-1    | 1              | --    | --       |
| Functional Markers                     | 0.05 | 0.22 | 0-1    | 1              | --    | --       |
| Rhetorically Functional Repetitions    | 0.21 | 0.56 | 0-3    | Unlimited      | 3.26  | 11.69    |
| Functional elements, total              | 2.1  | 0.56 | 0-3    | Unlimited      | 6.34  | 47.14    |
| Nonfunctional elements, total           |      |      |        |                |       |          |

Note. ( ) = Standard Error
Quality

The descriptive statistics reveal that the quality of the opinion essays tended to be low, with the writers’ ideas only partially developed ($M=3.18; SD = 1.40$). Specifically, three and a half percent of the essays ($n=4$) did not include an opinion and thus received a quality score of zero. Further, 6.3% ($n=7$) wrote an undeveloped essay, 20.5% ($n=23$) wrote a minimally developed essay, and 39.5% ($n=33$) wrote a partially developed essay. A total of 25% of the participants ($n =28$) wrote a developed essay and 9.8% ($n=4$) wrote a well developed essay. Very few students (4.5%; $n = 5$) wrote a highly developed essay, and only one student (0.9% of the sample) wrote an elaborated essay.

Elements of Argumentative Discourse

On average, the participants included 9.68 ($SD = 4.38$) functional elements and 0.23 ($SD = 0.91$) nonfunctional elements in their opinion essays. Of the functional elements, the students included an average of 7.01 ($SD = 4.02$) “myside” elements, which includes the writer’s standpoint, the writer’s level 1 reasons for the standpoint, and the reasons below level 1. The students included an average of 2.31 ($SD = 1.75$) Level 1 reasons to support the standpoint, and a mean of 3.56 ($SD = 3.50$) reasons below Level 1 to provide supporting details and elaboration upon the initial reasons (see Table 3 for percentages and frequencies of elements).

In regard to “yourside” functional elements, which include counterarguments, rebuttals, and alternative standpoints, an average of 1.71 ($SD = 2.03$) “yourside” functional elements were included in the opinion essays. Further, 50% ($n=56$) of the students did not include counterarguments in their essays, 29.5% ($n=33$) included one counterargument, 14.3% ($n=16$) included two counterarguments, and 6.3% ($n=7$) included three counterarguments in their essays. Regarding rebuttals, 54.5% ($n=61$) of the students did not include rebuttals in their essays.
Approximately thirty percent \( (n=34) \) of the students included one rebuttal, 9.8\% \( (n=11) \) included two rebuttals, 4.5\% \( (n=5) \) included three rebuttals, and 0.9\% \( (n=1) \) included four rebuttals in the essays. One of the students included an alternative standpoint and two reasons for the alternative standpoint, resulting in a mean of 0.01 \( (SD = 0.09) \) and 0.02 \( (SD = 0.19) \), respectively. The presence of counterarguments, rebuttals and alternative standpoints is encouraging in the writing of this low-achieving sample, especially since the prompt did not call for these elements.

A mean of 1.02 \( (SD = 1.02) \) “extra” functional elements (i.e., introduction, conclusion, title, rhetorically functional repetitions, functional markers) were included in the opinion essays. A total of 27.7\% \( (n=31) \) of the participants included an introduction, 40.2\% \( (n=45) \) included a conclusion, 5.4\% \( (n=6) \) included a title, 5.4\% \( (n=6) \) included rhetorically functional repetition, and 15.2\% \( (n=17) \) included a functional marker.

**Coherence**

In addition, the coherence of the essays was fairly low \( (M=1.79; SD = 0.83) \). Nearly four percent of the essays \( (n=4) \) lacked any coherence in their essays, 35.7\% of the essays were partially coherent \( (n=40) \), 38.4\% \( (n =43) \) were adequately coherent, and 22.3\% \( (n=23) \) were very coherent.

**Cohesion**

In regard to cohesion, as measured by skillful use of cohesive ties, the essays were only moderately cohesive \( (M=1.63; SD = 0.92) \). Nearly eleven percent of the essays \( (n=12) \) lacked any cohesive ties, 34.8\% minimally used cohesive ties \( (n=39) \), 35.7\% \( (n =40) \) moderately used the cohesive ties, and 18.8\% \( (n=21) \) skillfully used cohesive ties. In total, the participants included an average of 1.91 \( (SD = 1.28) \) cohesive ties in their essays.
Table 3

Percentage and Frequency of Functional and Nonfunctional Elements Included in Opinion Essays (n=112)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage</th>
<th>Frequency of Elements Included</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>0</td>
</tr>
<tr>
<td><strong>Elements of Argumentative Discourse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Myside&quot; functional elements</td>
<td>99.1%</td>
<td>1</td>
</tr>
<tr>
<td>Author' standpoint</td>
<td>98.2%</td>
<td>2</td>
</tr>
<tr>
<td>Level 1 reasons</td>
<td>95.5%</td>
<td>5</td>
</tr>
<tr>
<td>Reasons below Level 1</td>
<td>80.4%</td>
<td>22</td>
</tr>
<tr>
<td>&quot;Yourside&quot; functional elements</td>
<td>50.9%</td>
<td>55</td>
</tr>
<tr>
<td>Counterarguments</td>
<td>50.0%</td>
<td>56</td>
</tr>
<tr>
<td>Elaboration of counterarguments</td>
<td>0.9%</td>
<td>111</td>
</tr>
<tr>
<td>Rebuttals</td>
<td>45.5%</td>
<td>61</td>
</tr>
<tr>
<td>Elaboration of rebuttals</td>
<td>9.8%</td>
<td>101</td>
</tr>
<tr>
<td>Alternative Standpoint(s)</td>
<td>0.9%</td>
<td>111</td>
</tr>
<tr>
<td>Level 1 reasons for alternative standpoint(s)</td>
<td>0.9%</td>
<td>111</td>
</tr>
<tr>
<td>&quot;Extra&quot; functional elements</td>
<td>66.1%</td>
<td>38</td>
</tr>
<tr>
<td>Introduction (0 or 1)</td>
<td>27.7%</td>
<td>81</td>
</tr>
<tr>
<td>Conclusion (0 or 1)</td>
<td>40.2%</td>
<td>67</td>
</tr>
<tr>
<td>Title (0 or 1)</td>
<td>5.4%</td>
<td>106</td>
</tr>
<tr>
<td>Functional marker(s)</td>
<td>15.2%</td>
<td>95</td>
</tr>
<tr>
<td>Rhetorically functional repetition(s)</td>
<td>5.4%</td>
<td>106</td>
</tr>
<tr>
<td>Functional elements, Total</td>
<td>99.1%</td>
<td>1</td>
</tr>
<tr>
<td>Nonfunctional elements, Total</td>
<td>12.5%</td>
<td>98</td>
</tr>
</tbody>
</table>

**Question 2**

Prior to answering the second research question, “To what extent do the written components of the argumentative essays (i.e., inclusion of functional elements, coherence, cohesion, and length) and the demographic characteristics of the writer (i.e., reading ability, science interest, science knowledge, gender, and native language) contribute to overall quality of
The argumentative essays, an inter-correlations table was created in order to assess the relationships among the predictor variables and the outcome variable (i.e., quality of argumentative essay). Table 4 provides a list of the inter-correlations among the functional elements, nonfunctional elements, coherence, cohesion, length, reading ability, science interest, science knowledge, gender, native language, and quality of essay.

Table 4

Inter-Correlations among Predictor Variables and Outcome Variable, i.e., Quality of Essay (n=112)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Functional Elements</td>
<td>-</td>
<td>0.21*</td>
<td>0.28**</td>
<td>0.16</td>
<td>0.77**</td>
<td>0.14</td>
<td>0.19*</td>
<td>0.15</td>
<td>0.00</td>
<td>0.29**</td>
<td>0.47**</td>
</tr>
<tr>
<td>2. Nonfunctional Elements</td>
<td></td>
<td></td>
<td>-0.10</td>
<td>0.06</td>
<td>0.12</td>
<td>-0.02</td>
<td>-0.16</td>
<td>-0.10</td>
<td>-0.11</td>
<td>-0.18</td>
<td>-0.11</td>
</tr>
<tr>
<td>3. Coherence</td>
<td></td>
<td></td>
<td></td>
<td>0.45**</td>
<td>0.23**</td>
<td>0.02</td>
<td>-0.11</td>
<td>-0.11</td>
<td>0.10</td>
<td>0.23*</td>
<td>0.78**</td>
</tr>
<tr>
<td>4. Cohesion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.27**</td>
<td>-0.17</td>
<td>-0.08</td>
<td>-0.14</td>
<td>0.14</td>
<td>0.23*</td>
<td>0.48**</td>
</tr>
<tr>
<td>5. Length of Essay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.07</td>
<td>0.15</td>
<td>0.06</td>
<td>0.42**</td>
<td>0.21*</td>
<td>0.42**</td>
</tr>
<tr>
<td>6. Reading Ability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.46**</td>
<td>0.30**</td>
<td>-0.14</td>
<td>0.02</td>
<td>0.09</td>
</tr>
<tr>
<td>7. Science Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.29*</td>
<td>-0.11</td>
<td>-0.01</td>
</tr>
<tr>
<td>8. Science Interest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.03</td>
<td>-0.13</td>
</tr>
<tr>
<td>9. Native Language</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.10</td>
</tr>
<tr>
<td>10. Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Quality of Essay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. ** p < .01, * p < .05
In order to answer the second research question, “To what extent do written components of the argumentative essays (i.e., inclusion of functional elements, coherence, cohesion, and length) and the demographic characteristics of the writer (i.e., reading ability, science interest, science knowledge, gender, and native language) contribute to overall quality of the argumentative essays?”, an ordinal logistic regression was conducted. Ordinal logistic regression was utilized given that the outcome variable of “quality” was measured through an ordinal scale. All nine predictors variables (i.e., coherence, cohesion, number of functional elements, essays length, reading ability, science interest, science knowledge, gender, English as native language) were entered into the model simultaneously and were treated as covariates; the dependent variable was the quality of the argumentative essays.

In using ordinal logistic regression, a test of parallel lines was run to check the assumption that the slope coefficients were the same across all variable categories. This assumption was met (Test of Parallel Lines, Chi Square = 44.57, (54), p > 0.81). Overall, the model was significant, indicating that the null hypothesis (i.e., a model without predictors was as good as a model with predictors) could be rejected (Chi Square = 143.46 (9), p< 0.001). A summary of the ordinal logistic regression is provided in Table 5.
Table 5

Summary of Ordinal Logistic Regression for Written Components of Argumentative Essays and Demographic Characteristics of Writers, Using Quality of Essay as Outcome Variable (n=112)

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Estimate</th>
<th>SE</th>
<th>p</th>
<th>95% CI</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Written Components</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coherence</td>
<td>2.89</td>
<td>0.39</td>
<td>0.00**</td>
<td>2.14, 3.65</td>
<td>18.03</td>
</tr>
<tr>
<td>Cohesion</td>
<td>0.49</td>
<td>0.24</td>
<td>0.04*</td>
<td>0.02, 0.97</td>
<td>1.64</td>
</tr>
<tr>
<td>Functional Elements</td>
<td>0.20</td>
<td>0.07</td>
<td>0.01*</td>
<td>0.06, 0.35</td>
<td>1.23</td>
</tr>
<tr>
<td>Length</td>
<td>0.01</td>
<td>0.01</td>
<td>0.46</td>
<td>-0.01, 0.02</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Demographic Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Ability</td>
<td>0.01</td>
<td>0.01</td>
<td>0.16</td>
<td>-0.01, 0.03</td>
<td>1.01</td>
</tr>
<tr>
<td>Science Knowledge</td>
<td>-0.12</td>
<td>0.80</td>
<td>0.88</td>
<td>-0.17, 0.15</td>
<td>1.00</td>
</tr>
<tr>
<td>Science Interest</td>
<td>0.00</td>
<td>0.04</td>
<td>0.99</td>
<td>-0.08, 0.08</td>
<td>0.99</td>
</tr>
<tr>
<td>Native Language (English)</td>
<td>-1.14</td>
<td>0.40</td>
<td>0.01**</td>
<td>-1.99, -0.29</td>
<td>0.32</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>-0.27</td>
<td>0.44</td>
<td>0.50</td>
<td>-1.06, 0.51</td>
<td>0.76</td>
</tr>
</tbody>
</table>

Note. * p < .05, ** p < .001

Results for Question 2: Written Components and Quality

In regard to the portion of the second research question, “To what extent do written components of the argumentative essays (i.e., inclusion of functional elements, coherence, cohesion, and length) contribute to overall quality of the argumentative essays?”, the results yield several significant relationships. Specifically, the variables of “coherence”, “functional elements”, and “cohesion” are shown to have a positive and significant relationship to quality. Of note, odds ratio scores above 1.00 indicate a positive association, odds ratios below 1.00 indicate
a negative association, and odds ratio scores at or close to 1.00 indicate that there is no significant relationship present.

The results for “coherence” indicate that for every unit increase in coherence, the odds ratio of receiving a higher quality rather than a lower quality score is 18.03 ($p<0.00$). Stated differently, the likelihood for students to receive a higher quality score rather than a lower quality score increases by 18.03 for every unit increase in students’ coherence score.

In regard to “functional elements”, the results indicate that for every unit increase in the number of functional elements included in students’ essays, the odds ratio for students to receive a higher quality score than a lower quality score significantly increases is 1.23 ($p<0.001$). Thus, the likelihood for students to receive a higher quality score rather than a lower quality score increases by 1.23 for every unit increase in the number of functional elements included in the essays.

In addition, “cohesion” appeared to have a significant association with essay quality. For every unit increase in the cohesion scale, the odds ratio for students receiving a higher quality score than a lower quality score significantly is 1.64 ($p<0.05$). Essay length did not have a significant association to essay quality, and yielded an odds ratio of 1.00 ($p>0.05$). Therefore, the number of words students included in their essays did not significantly contribute to their quality scores.

Results for Question 2: Demographic Characteristics and Quality

To answer the second component of the research question, “To what extent do the demographic characteristics of the writer (i.e., reading ability, science interest, science knowledge, gender, and native language) contribute to overall quality of the argumentative
essays?” it was found that only native language had a significant association with essay quality. For this sample of remedial community college students, the odds of speaking English as native language decreases the likelihood of receiving a higher quality score than a lower quality score by 0.32 ($p<0.05$). Stated differently, native English speakers are only 1/3 as likely to receive a higher quality rather than lower quality score as opposed to their peers who are non-native English speakers.

In contrast, the results indicated that reading ability, science interest, science knowledge, and gender characteristics of the writer did not have a unique, significant association with essay quality. Science knowledge did not significantly contribute to a difference in overall quality score (odds ratio, 1.00; $p>0.05$), nor did reading ability (odds ratio, 1.01; $p>0.05$) or science interest (odds ratio, 0.99; $p>0.05$). Interestingly, it was found that males were 25% more likely to receive a higher quality rather than a lower quality essay score; however, the overall relationship between gender and quality was not significant (odds ratio, 0.76; $p>0.05$).
Chapter III
DISCUSSION

Overview

Recent statistics indicate that many students graduate from high school underprepared to engage in the skills necessary to complete college-level coursework (Graham & Perin, 2007a). A majority of these academically underprepared graduates who pursue a postsecondary education enroll in community colleges (Calcagno, Crosta, Bailey, & Jenkins, 2007; Perin, 2006; Southard & Clay, 2004), which hold an important role in the American educational system. Community colleges nationwide are offering developmental (remedial) programs in order to better assist students in meeting the demands of college coursework. Limited research has been conducted on students enrolled in remedial community college programs, despite the growing number of academically underprepared students enrolled in these programs. In particular, little is known regarding the argumentative writing skills of community college students, and the various academic and demographic characteristics that may be associated with writing performance at the college level.

The current study served to provide a descriptive analysis of the writing skills of low-achieving community college students, who are at present a growing and under-researched population in the United States (Perin, 2003). This study expanded upon previous research on written argumentation (Ferretti et al, 2009; Moore & Troia, 2006; Sexton, Harris, & Graham, 1998; De L Paz, 1995; Golder and Coirier, 1994; Crammond, 1998; Knudson, 1992; Witte & Faigley, 1981) and investigated key written components of the essay and the demographic characteristics writers that may be associated with argumentative essay quality.
The first research question of the study asked, “To what extent are the argumentative essays written by community college remedial students inclusive of argumentative elements, coherent, cohesive, and of high quality?”. The findings indicate that low-achieving community college students wrote argumentative essays that were, on average, partially developed, included a moderate amount of functional elements, partially coherently organized, and included minimal use of cohesive ties. This finding is consistent with previous research conducted on elementary and secondary students with learning disabilities (Monroe & Troia, 2006; De La Paz, 2005; De La Paz, 1995, Sexton, Harris, & Graham, 1998). Specifically, the current study shows that community college remedial writers perform similarly to poorer skilled and younger or novice writers in that their essays tend to be partially developed and lack the organization and coherence needed to obtain higher quality scores on argumentative essays.

The most recent National Association of Educational Progress (NAEP, 2007) assessment on the writing skills of 8th and 12th grade students nationwide offers a reference point for comparing the writings skills of the participants in the current community college sample and those from the general population of students nationwide. In comparison to the 12th grade population evaluated through the NAEP (2007) assessment, the sample of community college students included in the present study exhibited less competent argumentative writing skills. For example, the NAEP 2007 assessment found that 39% of the 12th grade students in the nationwide sample (N=27,900) wrote argumentative essays that were considered below sufficient, 34% wrote essays that were considered to be sufficient, and 26% wrote essays that were greater than sufficient (Salahu-Din, Perseky, & Miller, 2008). The essays in the NAEP study were scored using a comparable holistic rating rubric to the measure used in the present study. In regard to the community college students in the current sample, 61% wrote essays that were
underdeveloped (i.e., below sufficient), 25% wrote essays that were developed (i.e., sufficient), and only 11% wrote essays that were well or highly developed (i.e., above sufficient).

Considering that the quality measure in the current study defined a developed essay to be inclusive of an opinion, a reason for the opinion, and three supporting details for the reason, it is notable that students were largely unable to master this explicit task. The findings suggest that the remedial community college students in this sample tend to write argumentative essays that are of poorer quality than those of the general, nationwide population. Although the comparison should be interpreted with caution due to the vast difference in sample sizes of the present study and NAEP 2007 study, as well as slight differences in the scoring rubrics, it is notable that the postsecondary (i.e., community college) students performed less well than the secondary (i.e., 12th grade) students. This finding points to the growing need of effective remediation services within community college settings in order to increase the literacy skills of academically underprepared students.

In addition, the findings from the first research question indicate that the community college students in the sample wrote argumentative essays that included a moderate amount of functional elements ($M=9.68$), were partially coherently organized ($M=1.79$), and included minimal use of cohesive ties ($M=1.63$). These findings are similar in part to results found in a study conducted by De La Paz (1995) using a sample of forty-two 5th, 6th, and 7th grade students. De La Paz found that participants in her study, which utilized an argumentative writing prompt on the topic of homework, wrote essays that included an average of 7.40 functional elements, and wrote essays that average a coherence score of 2.40 and a cohesion (i.e., use of linguistic ties) score of 1.75. Although the community college students in the present study tended to include more functional elements in their argumentative essays, the overall coherence score was
lower than the essays written by the middle school students De La Paz’s (1995) sample. It is plausible that the inclusion of functional elements may not necessarily increase coherence, i.e., the extent to which the writer’s ideas are organized in a clear, understandable manner. The writer needs to order the functional elements in a way that makes sense to the reader and in manner that does not include inconsistent, illogical, or poorly supported information. The findings from the first research question indicate that the coherence of the argumentative essays written by the community college students was relatively low, as was the use of cohesive ties, in comparison to the amount of functional elements included in the essays. Therefore, it is apparent that the presence of the argumentative elements in essay alone may not fully account for the quality of the argumentative essays.

Secondly, the present study asked, “To what extent do the written components of the argumentative essays (i.e., inclusion of functional elements, coherence, cohesion, and length) and the demographic characteristics of the writer (i.e., reading ability, science interest, science knowledge, gender, and native language) contribute to overall quality of the argumentative essays?” The results from the ordinal logistic regression analysis indicate that when taken together, the written components of the essay (i.e., inclusion of functional elements, coherence, cohesion, length) and the demographic characteristics of the writer (i.e., reading ability, science interest, science knowledge, gender, native language) are significantly associated with the writing quality of the argumentative essays written by the community college students in the sample. In particular, the variable of coherence was shown to have a significant, strong association with argumentative essay quality; the findings indicated that the likelihood for students to receive a higher quality score rather than a lower quality score is 18.03 for every unit increase in students’ coherence score. Thus, it appears that students’ coherent organization of
their ideas and argument structures is a strong, significant predictor for the writing performance of argumentative essays.

It was also found that inclusion of functional elements and use of cohesive ties were significantly related to quality; these relationships appeared to have a smaller level of significance than the relationship between coherence and quality. An interpretation of this finding suggests that although students may include functional elements (e.g., opinion, reasons and support for their opinions, counterarguments), they may not construct their arguments coherently and/or may include contrasting or undeveloped arguments. This lack of organization and development may impact overall coherence and subsequently decrease the overall quality of the argumentative essays (Santos & Santos, 1999; Nussbaum & Kardash, 2005). In addition, although students may include cohesive ties in their essays, they may not do so properly and/or may misuse the meaning of the cohesive ties. Furthermore, it was found that length of the essays did not appear to be significantly associated with essay quality, meaning that the number of words included in the essay did not appear to affect essay quality. Given the association between coherence and quality from the ordinal logistic regression analysis, the findings indicate that the writers’ coherent organization of ideas i.e., logical ordering and development of arguments, significantly contributes to overall argumentative essay quality, over and above the writer’s inclusion of functional elements, use of cohesive ties, and essay length.

It should be noted, however, that although essay length (i.e., word count) did not uniquely contribute to quality in the overall ordinal logistic regression model, length was in fact significantly correlated to coherence, cohesion and essay quality, as well as to native language, as indicated by a simple correlational analysis. It is plausible that in the ordinal logistic regression model, the variables of coherence, cohesion, and native language largely accounted
for the variance associated with length and quality, and contributed to the finding as to why length did not appear as a significant, unique predictor for essay quality. As such, if coherence, cohesion, and native language were not included in the overall logistic regression model, it is possible that the variable of length may have yielded a significant, unique contribution to essay quality in the analysis.

In regard to the demographic components of the writer, the findings indicate that native language is significantly associated to essay quality. The results of the present study yield interesting findings on native language, as it appeared that the native-English language speakers wrote essays that earned lower quality scores than non-native English language speakers. In contrast to this finding, previous research conducted by Becker (2005) found that native-English speakers wrote argumentative essays that were more developed than non-native English speakers; in the present study, it was found that non-native English speakers wrote argumentative essays that were more developed and of higher quality than the native-English speakers. An explanation for this finding may relate to the unique characteristics of sample itself, which includes only developmental community college students who did not pass entry-level literacy exams. The native-English speakers (as well as the non-native English speakers) in the current sample have been identified as in need of remedial education for reading and writing skills. It is possible that the native-English speakers included in this sample may differ from the native-English speakers from the general population (albeit it from level of exposure to English, language proficiency of students’ caregivers, presence of learning disabilities, etc.). Future research should be conducted in the area of native language to explore differences in writing performance, if any, among native-English and non-native English speakers in developmental programs and those in general education. However, as Coleman and Goldenberg (2011) noted,
both native English and non-native English speakers appear to benefit from explicit instruction in literacy components.

Findings from the present study also indicate that reading ability, science interest, science knowledge, and gender of the participants did not provide a unique, significant contribution to argumentative essay quality. It is plausible that the relatively low levels of reading ability, science interest, and science knowledge impacted the degree to which these variables were associated with writing quality. In particular, descriptive statistics for the Nelson Denny Reading Test revealed that the average total raw score for participants in the current sample was 68.27, which is comparable to the reading performance of the 9th grade students ($M=67.83$) included in the Nelson Denny standardization sample. This finding was supported by a study conducted by Haught (2005), which compared the Nelson Denny Reading Test scores for 9th grade students, 12th grade students, 4-year college freshman, 4-year college seniors, and medical professionals. Haught found that the Nelson Denny Reading Test raw scores were as follows: 67.83, 90.96, 97.61, 121.96, and 137.75, respectively. Findings from the present study indicate that students in the current sample exhibit reading skills that are most comparable to high school freshman rather than high school seniors, postsecondary or postgraduate students.

The present study also indicated that while gender did not have a significant association with quality, males were three-quarters more likely to receive a high quality score than a low quality score than their female counterparts. This finding contributes to what is known regarding gender and writings skills. Previous research has found that females perform better on writing assessments measured in holistic scores of quality (Hidi, Berndorff & Ainley, 2002); this finding may be attributed to the tendency for females to have faster handwriting speeds and the tendency for females to be more conscientious than males on writing tasks (Cohn, Cohn & Bradley, 1995;
Graham, Berninger, Weintraub & Schafer (1998). The lack of significance in the association between gender and argumentative writing quality in the present study indicates a need for future research on gender and performance within the community college academic setting.

**Limitations of the Study**

The conclusions that can be drawn from the current study are subject to several limitations. First, it should be noted that the descriptive analyses and ordinal logistic regression analysis do not take into account rater error associated with the scoring measures. For example, the reconciled scores from the 45 inter-rater essays were pooled into the overall data file, in conjunction with the remaining 67 essays scored solely by the primary author (n=112). Thus, the analyses treated the scores as having “perfect” agreement without taking into account rater discrepancies. A statistical approach that takes into account rater error into the analysis is recommended.

Second, the argumentative writing prompt for the essay provided an explicit task, namely, state an opinion, and give a reason and three supporting details. This prompt was chosen in order to provide the students with a clear foundation for the task demands. However, it is possible that this prompt may have impacted the number of reasons generated to support the writer’s stated opinion, as well as the inclusion of “your side” elements (i.e., counterarguments, rebuttals) in their essays. Perhaps a more open-ended prompt, such as “Provide reasons to support your opinion”, may serve to enhance students’ generation of “myside” and “yourside” elements, and to promote greater inclusion of functional elements in the essay.

Third, the prompt on organic food was written in collaboration with the input from a panel of community college instructors. These instructors considered the topic of organic food
to be familiar among students in the sample; however, topic familiarity topic was not in fact checked. Future studies should verify the familiarity of the topic for the writing prompt, which may have a potential impact on students’ writing performance on the topic.

Fourth, it is plausible that the lack of a statistically significant relationship between science knowledge and essay quality may be due to the broad nature in which the science knowledge measure spans. It may have been beneficial to use a prior knowledge measures that focuses specifically on the topic of organic food addressed by the writing prompt. In addition, the lack of a statistically significant relationship between science interest and essay quality may also have been related to broad nature of science interest covered within the Science Interest Inventory. As was the case with the science knowledge measure, it would have been beneficial to use a science interest measure that was tailored more specifically to the argumentative writing prompt on organic food. Using science interest and science knowledge measures that were more tailored toward the specific prompt may have served to better capture the differences among the writer’s level of interest and prior knowledge related to the topic of organic food.

Fifth, it is recognized that there was no comparison group used in the present study. It would be informative to gain comparative information on the argumentative writing skills of community college students who are academically prepared versus underprepared to meet the demands of college level writing. It is possible that there may be differences in participant characteristics and respective performances on argumentative writing tasks. Such information may shed light into the unique characteristics of community college students of varying academic achievement.

Lastly, it should be noted that the scoring manual utilized in this study for identifying and scoring elements of argumentative was designed specifically for this study. The current author
received direct in training for indentifying elements of argumentative discourse from Professors Ralph Ferretti and William Lewis of the University of Delaware, prior to designing and implementing the scoring (graphing) manual. This scoring manual was tailored for the prompt on organic food and included examples of specific argument structures from essays derived from the author’s pilot study utilizing the same writing prompt. Much time and effort was devoted toward creation of the scoring manual, as well as for training a second rater to graph and score the elements of argumentative discourse. The lengthy process of creating the manual and training rater(s) for its use may limit the feasibility for its application within classroom and applied settings. However, given that the information derived from using the scoring manual yields pertinent information on students’ inclusion of argumentative elements, as well as the nature of how argument structure is organized within the essay, it would be beneficial to produce a general scoring manual for graphing elements of argumentative discourse that could be used within varied applied educational and research settings.

**Educational Implications**

Argumentative writing is an important yet challenging academic skill for secondary and postsecondary students to master. Previous research has focused largely on the argumentative skills and proficiency of secondary students; however, little is known regarding the argumentative writing skills of community college developmental education students. A comprehensive examination of students’ writing skills, particularly on persuasive writing tasks, sheds greater light into the developmental cognitive processes of argumentative writing. Through this examination, the necessary information to better inform instructional and administrative policies may be gained.
In order for remedial education programs to succeed, it is first necessary to identify the skills associated with high performance in the designated area. The present study contributes to what is known about the writing components of postsecondary students, and indicates that there is a significant association between essay quality and the written components of coherence, inclusion of functional elements, and cohesion. Therefore, providing instruction within these areas of written composition may enhance students’ argumentative writing skills, both for native-English speakers and non-native English speakers alike (Coleman & Goldenberg, 2011).

The Self-Regulated Strategy Development (SRSD) model has been widely documented as an effective framework for strategy instruction of argumentative writing (Jacobson, & Reid, 2010; Lienemann & Reid, 2008; De La Paz, Morales, & Winston, 2007; Lienemann, Graham, Leader-Janssen, & Reid, 2006; Sexton, Harris, & Graham, 1998). In particular, two widely implemented SRSD strategies for argumentative writing include: the “STOP” mnemonic strategy: Suspend judgment; Take a side; Organize your thoughts; Plan more while you write; and the “DARE” mnemonic strategy: Develop the topic sentence; Add supporting ideas; Reject possible arguments for the other side; End with a conclusion”. Both of these strategies are designed to promote the planning, writing, and revising of argumentative essays (which may enhance the essay’s level of coherence), and are aimed at increasing students’ effective inclusion of argumentative elements within their persuasive essays. In addition, these SRSD strategies promote students’ ownership of their learning by (a) shifting from an instructor modeling approach to collaborative (i.e., group) practice to independent use of specific academic and self-regulation strategies, and (b) fading use of procedural scaffolds such as graphic organizers or other prompts that contain strategy steps (De La Paz, Morales, & Winston, 2007). These strategies serve to enhance students’ learning and understanding of the key components of
argumentative writing, and are designed to increase students’ skillful development of an argumentative essay.

Given the findings of the present study, it is apparent that the argumentative writing skills exhibited by the developmental community college students in the sample are in need of improvement. Effective writing instruction for academically underprepared students in the community college setting may be widely beneficial. Community colleges hold an important role in American educational system; enhancing the literacy skills of academically underprepared students is necessary not only for their own academic success, but also for better preparing these students for entering today’s workforce – one in which places a heavy emphasis on proficient literacy skills.
REFERENCES


Appendix A

Argumentative Writing Task

**Unit 1, Step 8.** In this step, you write an essay to continue your practice on skills you need for college courses. If the topic is unfamiliar, ask someone you know or look up the topic online.

Organic food is grown without pesticides. Some people like it because they think it is healthy. However, it can be expensive. What is your opinion of organic food? State your opinion. Give one reason, and at least three supporting details for your reason.

Write one or two paragraphs below, in full sentences. Use your own words!
### Quality of Argumentative Essay Scale

Adapted from Ferretti, Lewis, and Andrews-Weckerly (2009)

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.</td>
<td><strong>Response to topic.</strong> Paper responds to the topic in some way but does not provide an opinion on the issue.</td>
</tr>
<tr>
<td>1.</td>
<td><strong>Undeveloped opinion.</strong> Paper provides an opinion that is unclear or is undeveloped. Paper states an opinion but there are no reasons given to support the opinion, the reasons given are unrelated to or inconsistent with the opinion, or the reasons are incoherent. Reasons may be scattered incoherently throughout essay, and provide contradictory information.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Minimally developed.</strong> Paper states a clear or mostly clear opinion and gives at least one reason to support the opinion but the reasons not explained or elaborated in any coherent way. The reason may be of limited plausibility and several inconsistencies may be present.</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Partially developed.</strong> Paper contains a clear opinion and gives a reason and some detail for the reason. The supporting details only somewhat explain or elaborate upon the reason, and may contain some inconsistencies, irrelevant or unsupported information. Paper includes one reason and partially explained detail (e.g., two or fewer details) and/or unclear elaborations.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Developed.</strong> Paper states a clear opinion, and provides a reason and several supporting details for the reason. The supporting details are well elaborated and serve to explain the writer’s reasons for the stated opinion. The reasons and supporting details are generally plausible, and there are little to no problems with organization and clarity. Paper includes one reason and fully explained detail (e.g., at least three details) and clear elaborations.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Well developed.</strong> Paper is very clear and specific, and provides strong elaboration on the supporting details. There are no inconsistencies, irrelevant or unsupported information, or problems with organization and clarity. The reasons are clearly explained and are elaborated by using information that is generally convincing. Essay may have introductory or concluding statement, and may mention opposing opinion(s). Counterclaims may be present, though counterclaims are not elaborated or rebutted.</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Highly developed.</strong> Paper states a clear opinion and gives reasons to support the opinion. The reasons are explained clearly and elaborated by using information that could be convincing. Should mention opposing opinion. The essay is generally well organized and may include a concluding statement.</td>
</tr>
<tr>
<td>7.</td>
<td><strong>Elaborated and addressed opposition.</strong> Meets the criteria for previous level. In addition, the paper deals with the opposing opinions with either refutation, alternative solutions, or explaining why one side is more convincing than the other. Overall, the essay is positive. The paper is free of inconsistencies and irrelevancies that would weaken the argument.</td>
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Appendix C

Guidelines and Scoring Examples for Quality of Argumentative Essay Scale

Locally Devised for Current Dataset, Adapted from Ferretti, Lewis, & Andrews-Weckerly (2009)

0. **Response to topic.** Paper responds to the topic in some way but does not provide an opinion on the issue.
   
   a. *No opinion provided or the topic is off prompt.*
   
   b. Writer may list various alternative opinions, yet does not address own opinion.
      Paper does not include personal opinion on topic.

Sample Essay, Score of “0”:

The body needs six different nutrition to stay healthy and working. Many people are to busy, and don't take the time to eat properly, this can cause a shorter life span, cancer, and ageing of the skin. The six kinds of major nutrition are carbohydrates, lipids, vitamins, minerals, and water. Water sounds like not a big deal but it actual take up 60 percent of volume of the food we eat. The carbohydrates are the sugars and starches we eat which come from plants. The most dietary substances are lipids which is the saturated fats we eat. Vitamins come in various forms, our body needs these to prevent cell damage and other affects to the body. Unfortunately we do not have all of what we need in a day, that’s why having a healthy diet is good. The human body needs all these nutrition and more. Research on organic food could help to keep your body alive and healthy.

1. **Undeveloped opinion.** Paper provides an opinion that is unclear or is undeveloped. Paper states an opinion but there are no reasons given to support the opinion, the reasons given are unrelated to or inconsistent with the opinion, or the reasons are incoherent. Reasons may be scattered incoherently throughout essay, and provide contradictory information.
   
   a. *Opinion present, yet undeveloped (no reasons or inconsistent reasons)*
   
   b. Opinion provided, though no reasons given to support opinion. If reasons are given, they are either illogical, inconsistent, or unrelated to opinion.

Sample Essay, Score of “1”:

Food is the source of energy we get in order to live. If you have a good source the outcome would be the same. Although organic food is expensive one should not hesitate to buy it because nothing is more expensive than a healthy life style.

2. **Minimally developed.** Paper states a clear or mostly clear opinion and gives at least one reason to support the opinion but the reasons not explained or elaborated in any coherent way. The reason may be of limited plausibility and several inconsistencies may be present.
a. **Opinion, reason, and no support for reasons.**
b. Opinion and reasons are provided, though there are no supporting details present for the reasons. Problems with organization and clarity interfere with flow of essay.

Sample Essay, Score of “2”:

Although organic food is expensive, some people still like it because it is thought to be healthier than the regular one. To gain a big size fruit or good looking food, some people use pesticides and other chemical substance to grow their fruit or vegetable. No matter how many we clean our food, it is still have chemical substance which is not good for our health. Organic food is grown by using natural fertilization. Plus, the more chemical substance is produced, the more harmful it is to our environment.

3. **Partially developed.** Paper contains a clear opinion and gives a reason and some detail for the reason. The supporting details only somewhat explain or elaborate upon the reason, and may contain some inconsistencies, irrelevant or unsupported information. Paper includes one reason and partially explained detail (e.g., two or fewer details) and/or unclear elaborations.

a. **Opinion, reason, and some supporting detail for reason.**
b. Opinion reason, and some supporting detail for reason is provided. Paper includes one or two supporting details for reasons. Reasons and details are generally plausible. Some problems with organization and clarity may be present.

Sample Essay, Score of “3”:

My opinion of organic food is that’s healthier than non-organic food. A reason for this is that organic food does not use pesticides that can cause cancer. By not using pesticides are environment is not being polluted as much. Organic food tastes better then food that use pesticides during food are healthier.

4. **Developed.** Paper states a clear opinion, and provides a reason and several supporting details for the reason. The supporting details are well elaborated and serve to explain the writer’s reasons for the stated opinion. The reasons and supporting details are generally plausible, and there are little to no problems with organization and clarity. Paper includes one reason and fully explained detail (e.g., at least three details) and clear elaborations.

a. **Opinion, reason, and elaborated supporting detail for reason.**
b. Opinion reason, and elaborated supporting detail for reason is provided. Paper includes three supporting details for reasons. Reasons and details are plausible. Little to no problems with organization and clarity.

Sample Essay, Score of “4”:
Organic food is a healthy option to choose. I feel that organic food is a healthy option because it is natural. The different types of organic foods are planted and good for you. Unlike other foods that are not organic, organic food doesn’t include artificial fertilizer or human waste that can cause sickness. Another reason organic food is a healthy option is because it has a higher nutrient level than others. When it comes to health, nutrients are a key part of keeping your body healthy.

5. **Well developed.** Paper is very clear and specific, and provides strong elaboration on the supporting details. There are no inconsistencies, irrelevant or unsupported information, or problems with organization and clarity. The reasons are clearly explained and are elaborated by using information that is generally convincing. Essay may have introductory or concluding statement, and may mention opposing opinion(s). Counterclaims may be present, though counterclaims are not elaborated or rebutted.

   a. **Opinion, reason, and much elaborated supporting detail for reason.**
   b. Opinion, reason, and much elaborated supporting detail for reason is provided. Paper includes at least three supporting details for a reason, and/or has two developed reasons. Organization and clarity are strong.

**Sample Essay, Score of “5”:**

The organic food market has been growing rapidly in many countries, especially in Europe and the United States. A lot of people, including me, are convinced that food grown organically is healthier than that produced conventionally.

First of all, organic food comes from organic farming. Organic agriculture excludes the use of synthetic chemicals, such as fertilizers, pesticides and genetically modified organisms. There is no release of synthetic products into the environment, like soil, air, and water.

Second, we should consider health effects of pesticide exposure to those who work on farms. Even when pesticides are used correctly, they still end up in the air and bodies of farm workers, which can cause different acute diseases.

Finally, consumers claim that organic food looks more desirable tastes naturally, has better texture and smell. Products have higher nutrient levels without added colors, sweeteners and other artificial components.

6. **Highly developed.** Paper states a clear opinion and gives reasons to support the opinion. The reasons are explained clearly and elaborated by using information that could be convincing. Should mention opposing opinion. The essay is generally well organized and may include a concluding statement.

   a. **Opinion, reason, much elaborated supporting detail for reason, and opposing opinion acknowledged.**
   b. Opinion, reason, and much elaborated supporting detail for reason is provided. Paper includes at least three supporting details for a reason, and/or has two developed reasons. Opposing opinion is acknowledged. Organization and clarity enhance essay.
Sample Essay, Score of “6”:

Organic foods are more healthier, because its not used with chemicals, it provides more vitamins and its a medicine. Organic foods are better than any conventional food. Conventional foods that are produced is usually has the use of methods to fertilize. See convential foods use fertilizers to promote plant growth. In Organic foods they will apply natural fertilizers, such as manure or compost, to feed soil and plants. When conventional foods are spray down to reduce pests and diease, you would not know what kind of things that might get you sick; and organic foods uses beneficial insects and and birds mating disruption on traps to reduce pest and disease. Organic foods provide vitamins that can help people keep up with their dietary system. The vitamins in organic foods are vitamin C, iron, Calicum, chronium, selenium, boron, litium, magnesium, betakeratin, and vitamin B. These vitamins help you live a healthier life. You don’t have to be over weight because these vitamins are beneficial to your health needs. These vitamins in this organic food prevents diseases which is a use of medicine.

The organic food is useful to people because it can heal. As a saying goes “Let food be thy medicine, and medicine be thy food...” this shows how you can use organic food as a medicine. See the boron on the organic foods prevents osteoperosis. Osteoperosis is a disease of the bone leading to an increase risk of fracture. Osteoperosis is usually found in women. The organic food so prevents diabeties that is found in most people in the United States. In conclusion, organic foods are good for you because its more healthy.

7. **Elaborated and addressed opposition.** Meets the criteria for previous level. In addition, the paper deals with the opposing opinions with either refutation, alternative solutions, or explaining why one side is more convincing than the other. Overall, the essay is positive. The paper is free of inconsistencies and irrelevancies that would weaken the argument. Counterarguments presented are strong and elaborated or multiple counterarguments are presented.

    a. **Opinion, reason(s), much elaborated supporting detail for reason (s), opposing opinion acknowledged and addressed or rebutted.**

    b. Opinion, reason(s), and much elaborated supporting detail for reason is provided. Paper includes at least three supporting details for a reason, and may have two developed reasons. Opposing opinion is acknowledged and addressed. Organization and clarity greatly enhance persuasiveness of essay.
Sample Essay, Score of “7”:

My opinion about organic food is that it is amazing and healthy for you. There are several reasons why I believe organic food is good for you. First, it is free of pesticides. Secondly, studies have shown that a natural diet can lower your chances of acquiring unhealthy diseases. Thirdly, organic food often comes from independent farmers rather than large, money making corporations. It is best to support these farmers rather than big businesses.

As I mentioned above, organic food is free of pesticides. This means that only natural products are used on the produce and for the animals. By using no pesticides on growing or producing the food, we will not therefore eat unnecessary pesticides and put it in our body. Secondly, since we are not eating pesticides, it lowers are chances of getting diseases from the pesticides. This supports the overall reason why organic food is so good and healthy for you. Also, there is less fat and unnatural ingredients in the food, which can clog your arteries, increase your blood pressure, and be bad for your heart. Thus, organic good is better for your body and makes you less likely to get diseases from your food. Lastly, supporting organic food helps to support the farmers and “mom and pop” shops, since lots of organic food comes from local farmers. In my neighborhood, I buy organic food from the local farmers; I feel good about myself when I do this because I’m supporting the local people who need it the most.

I know that some people can argue that organic food is bad because it’s so expensive. Yes, it’s expensive, but it’s totally worth it. Actually, in the end it’ll save you money because you won’t have to pay so many doctors bills from getting sick so much. Therefore, I think that organic food is a great choice. Those were some of the reasons why I think organic food is so good.
Appendix D
Guidelines for Identifying Argumentative Discourse,
Functional Elements, and Nonfunctional Elements
Locally Devised for Current Dataset, Adapted from Lewis and Ferretti (2010)

Standpoints (SP, SN)
- The writer may include more than one standpoint in an essay. Be sure to distinguish between a standpoint and a counterargument (see section on counterarguments).
- If a writer’s initial standpoint is unclear, then subsequent elaborations or qualifications of it are nonfunctional (NF) unless the writer subsequently clarifies the standpoint. If the standpoint is subsequently clarified, the clarification is considered a Standpoint (SP) or (SN).

Reasons (R1)
- Reasons should answer the questions “why” the writer holds a certain standpoint.
- All reasons should be located underneath the related standpoint. Reasons are placed either underneath previous reasons (i.e., as in subordinative arguments) or side by side to each other (i.e., as in coordinative arguments).

Coordinative Arguments (R1a., R1b)
- Coordinative arguments consist of multiple reasons for the same standpoint. The reasons in a coordinative argument depend on one another to defend the standpoint, and therefore cannot “stand alone”. Each of the reasons must be necessary to defend the standpoint. As such, if one of the reasons is rebutted, the entire defense of the argument is rebutted.
- Common discourse markers for coordinating arguments include “and” “or” “;”.
- Some writers do not include discourse markers in their coordinative arguments.

Subordinative Arguments
- Subordinative arguments consist of a standpoint and a series of reasons that represent an argument for the preceding reason. Subsequently, each succeeding reason is a layer in the argument that defends the preceding reason. Layers are added until the defense of the viewpoint is solid.
- Be sure to distinguish between coordinative arguments and subordinative arguments. If the argument provides reasons that casual in nature and answers the questions “how” or “why”, then the argument is likely subordinative. If the reasons provide further elaboration and are too weak to “stand alone”, then the argument in likely coordinative.
- Discourse markers for causal links may include, though are not limited to, “therefore”, “because”, “and then”, “secondly”, “when”

Multiple Arguments
- Be sure to distinguish between multiple arguments and coordinative arguments
• Guiding rule: if there is a degree of subordination below a reason, then that reason should be scored as a multiple reason.

**Alternative Standpoints (AS)**
- An alternative standpoint is the presented position that is directly opposed to the writer’s stated standpoint.
- The alternative standpoint directly contrasts with the standpoint that the writer is advancing.
- Alternative standpoints are credited if the writer: (a) explicitly states that standpoint that he/she is trying to advance, and (b) implies a contrasting alternative standpoint.

**Counterarguments (CA)**
- A counterargument is a criticism or objection that could be used to undermine a person’s standpoint.
- In written arguments, counterarguments are described as potential criticisms of the writer’s standpoint and as support for the alternative viewpoint.
- It is important to note that counterarguments can occur, even if the argument does not closely relate to the writer’s initial (e.g., “myside” argument).
- As in coordinating arguments, counterarguments may be graphed side-by-side if the writer includes compound predicates. Counterarguments therefore can occur as “coordinative counterarguments”.

**Rebuttal (RB)**
- A rebuttal is a statement that refutes, weakens or undermines an alternative standpoint, and serves to strengthen the writer’s standpoint.
- A rebuttal can be expressed in two ways: (a) opposition to an explicit expression of an alternative standpoint and associated reasons; and (b) opposition to an explicit expression of a counterargument leveled against the writer’s standpoint and in support for the alternative standpoint.

**Nonfunctional Unit (NF)**
- Nonfunctional (NF) elements include: (a) repetitions, and (b) other information that does not appear to be relevant to the topic.
- Any unit that does not appear to play a role as a standpoint about the topic, reason(s) for the standpoint, alternative standpoint, counterarguments, rebuttals, reasons(s) for the rebuttal, introduction, and conclusion may be scored as nonfunctional. If the writer provides illegible or nonsensical information, it should be scored as nonfunctional.
- Verbatim (exact) repetitions are scored as nonfunctional repetitions (NF) unless they are used for emphasis or serve some function in the essay.
- At times, writers may provide a large portion of text that is incoherent and/or divergent from the original standpoint topic. This lack of incoherence and irrelevant topic matter can make graphing the text extremely difficult. If this situation arises, then the entire portion that is incoherent or divergent text section should be scored as nonfunctional.
**Functional Markers (FM), including Rhetorically Functional Repetitions (RFR)**

- A functional marker serves a particular purpose for the writer, and is often used as a transition to introduce reasons, arguments, and standpoints. Functional markers may also serve as transition statement for upcoming argumentative elements. Since the markers serve a particular purpose, it is not considered nonfunctional. Further, it is not considered a rhetorically functional repetition, since it does not restate previous argument.
- Rhetorically Functional Repetitions (RFR) occur when the writer restates previously expressed reasons, arguments, or standpoints; RFRs should be counted as functional markers. Some of these repetitions are rhetorically effective, but they don’t necessarily add to the breadth or depth of the argument. Since a RFR serves a discernable rhetorical purpose, it cannot be scored as a nonfunctional unit.
- The wording and content should be extremely similar to the original statement; otherwise, the RFR may be considered as an additional reason, argument, standpoint, etc.

**Title**

- Writers sometimes provide a title in the beginning of an essay, and may be considered an organizing element. Be sure to note use of titles.

**Introduction (I)**

- An introduction is defined as a foreshadow to what is to follow in the writer’s presentation of the argument.
- An introduction may outline the writer’s purposes, goals, or what the reader can essay. Introductions may be one sentence long, whereas others may be several sentences long.
- Not all essays include an introduction.
- Sometimes writers provide a title for the essay. Depending on the specific content, the title may serve as an introduction. Otherwise, the title may be graphed as a functional marker.

**Conclusion (C)**

- A conclusion is present when the writer gives a closing to what is written (i.e., “bring everything together”).
- If a writer writes “the end”, consider this as a conclusion. If the writer writes a conclusion (“That is why organic food is healthier than regular food”) followed by “the end” then the entire statement is considered as a conclusion.
- If the writer includes “new” (i.e., previously unmentioned) information in the conclusion, be sure to extract and graph the pertinent argumentative elements (e.g., reasons, rebuttals, counterarguments)
- Note that not all essays have a conclusion.
Appendix E
Scoring Manual for Graphing Argumentative Discourse,
Functional Elements, and Nonfunctional Elements
Locally Devised for Current Dataset, Adapted from Lewis and Ferretti (2010)

Standpoint

A standpoint is the representation of the writer’s stated belief or opinion that is presented for the reader’s acceptance. The standpoint always takes a proposition as its object, and ascribes a certain quality to a person or thing to which it refers (van Eemeren, Grootendorst, Snoeck Henkemans, 2002). A proposition predicates a quality or property to a person or thing, and can be a description of facts, a prediction, a judgment, or advice.

For example, a writer provides a standpoint: “Organic food is a healthy option to choose.”. In this example:

- The property or quality that is predicated to organic food is that it is healthy
- The standpoints represents a positive opinion about organic food
- The proposition represents the writer’s judgment

As such, a standpoint expresses an opinion about a proposition. The writer’s opinion about the standpoint can be positive or negative. These opinions are known as positive standpoints and negative standpoints in argumentative essays. The writer may also express more than one standpoint in an essay. Therefore, there may be multiple standpoints found in an essay.

Positive Standpoint - “Standpoint Positive (SP)”

A positive standpoint (SP) expresses an affirmative opinion about the proposition. People generally offer reasons to support a positive standpoint. Each of the following examples expresses a positive standpoint because they express affirmative opinions about a proposition:

I. “In my opinion people should consume organic food only.” (SP1)
II. “I think that organic food is good for you.” (SP1)
III. “A lot of people, including me, are convinced that food grown organically is healthier than that produced conventionally.” (SP1)

Positive Standpoint (I, II, III):
(Note: the “I” after SP indicates that this the first positive standpoint in the essay)

Single Positive Standpoint with Specific Elaborations

As a guiding principle for graphing standpoints, multiple propositions should be grouped together if they represented a “complete thought”. For example, the sentences below represent one complete positive standpoint:

IV. “My opinion of organic food is a positive one. I like organic food.” (SP1)
V. “Organic food, though expensive is better than chemically treated food.” (SP1)

These sentences should be graphed as a single “positive standpoint” unit, since it represents the writer’s complete statement of belief. Simply stated, the second sentence statement represents an elaboration of the first statement, both of which support the writer’s positive standpoint on organic food.

Negative Standpoint – “Standpoint Negative (SN)”

A negative standpoint (SN) expresses a negative opinion about the proposition. People generally offer reasons to support a negative standpoint. Each of the following examples expresses a negative standpoint because they provide negative opinions about a proposition. Both examples negate the proposition:

VI. “In my opinion, I don’t believe there is a health factor between organic food and regular produce.” (SN1)
VII. “I don’t really care for organic foods.” (SN1)
Negative Standpoint (VI, VII)

Single Negative Standpoint with Specific Elaboration

If the writer provides two statements that are closely linked and represent the same opinion about the proposition, then they should be graphed as a single negative standpoint unit. However, if the writer provides a statement that adds some elaboration, then the elaboration should be scored as a reason. For example, a writer states:

VIII. “Organic food is not such a good idea after all (SN1), there’s more to give than there is to gain (SN1.R1)”

Single Negative Standpoint with Specific Elaboration (VIII)

In the example, the writer is providing further elaboration for the specific standpoint point (even though the elaboration is somewhat unclear, it is marked as a supporting reason). The standpoint is negative because the writer states a negative opinion about the proposition.

Multiple Standpoints

An essay can have multiple standpoints that express the writer’s opinions. Multiple standpoints are present if the writer provides two (or more) clear statements of belief that are independent of one another. Note: be discriminate between multiple standpoints and a single standpoint with elaboration. The main difference between multiple standpoints and a single standpoint with elaboration is that multiple standpoints can “stand alone”, whereas a single standpoint with elaboration contains statements of belief that are closely linked (e.g., provide elaboration) and express the same opinion or quality toward the proposition.

X. “I don’t like organic food (SN1). But I also think organic food is a bit more healthy than the normal ones (SP2).”
Multiple Standpoints (X)
As a “rule of thumb”, multiple standpoints should represent individual statements of beliefs regarding a proposition. If a writer states a standpoint and then specifically elaborates on a standpoint in order to clarify it, then those specific elaborations should be scored as part of the original standpoint (see single {positive/negative} standpoint with elaboration).

For example,

XII. “Organic food is just as good as regular food. I think that it’s good to have some organic food.”

The reader may ask him/herself, “If organic food is ‘just as good as regular food’, then why does it matter to have good to have some organic food?” Here, the writer provides two standpoints – albeit contradictory.

Standpoints occur in two positions – Progressive and Retrogressive

(7) Standpoints in Progressive Form

If the standpoint is written before the writer provides reasons for the standpoint, then the argument is considered progressive and the standpoint is in progressive form. In theory, the standpoint is provides and progresses forward with reasons.

XII. “I really don’t like organic food (SN1) because it’s expensive (SN1.R1).”

Standpoints in Progressive Form

Here, the reason comes after the argument. Since there is one negative standpoint (SN1) followed by a corresponding reason (SN1.R1), the symbols are denoted as: “SN1.R1”. The direction of the arrow indicates that the standpoint came before the reason in the writer’s essay.
(8) Standpoints in Retrogressive Form

If the standpoint is written after the writer provides reasons for the standpoint, then the argument is considered retrogressive and the standpoint is retrogressive form.

XIII. “Organic food is expensive (SN.R1). Therefore I don’t like organic food (SN1)”.

Standpoints in Retrogressive Form

In the example above, the reason comes before the argument. Since there is one negative standpoint (SN1) followed by a corresponding reason (SN1.R1), the symbols are denoted as: “SN1.R1”. The direction of the arrow indicates that the standpoint came after the reason in the writer’s essay.

Also, note that even though the standpoint came after the reason, the standpoint is still placed at the top of the graph (e.g., the arrow serves as the directional marker). This aspect of the graph is important, since scoring will be based on the location of the argumentation units.

Reason

A reason is a justification that answers the question “why” a person holds a standpoint. The following are examples of reasons, which serve to support the writer’s standpoint:

I. “I really don’t care for organic foods (SN1) because it’s expensive (SN1.R1).”

II. “Organic food grown without pesticides is much better for the health of one’s body (SP1) because pesticides carry a strong amount of toxins (SP1.R1).”

Reasons (I, II)

Writers may include indicators or discourse markers that signal the expression of reasons. Indicators often include, but are not limited to, “because”, “for”, “first”, “second”, “one”.
Argument Structures

Every argument should include reasons that are structured in different ways to support a standpoint. There are four types of argument structures:

- **Single Arguments**
- **Coordinative Arguments**
- **Subordinative Arguments**
- **Multiple Arguments**

A single argument usually consists of the standpoint and a single supporting reason. The example below is a single argument. The writer provides a clear standpoint and one reason for the standpoint. Note that writers offer just one single argument in an essay; single arguments are often part of a larger argument structure.

Coordinative arguments consist of multiple reasons for the same standpoint. The reasons in a coordinative argument depend on one another to defend the standpoint, and therefore cannot “stand alone”. Each of the reasons must be necessary to defend the standpoint. As such, if one of the reasons is rebutted, the entire defense of the argument is rebutted.

In the graphing structure, coordinative arguments are denoted by placing the reasons “side by side” to each other. This visual mapping further denotes that there is interdependence between reasons in coordinative arguments. This is because either (1) individual reasons are too weak to stand alone to defend the standpoint, or (2) succeeding reasons may answer objections that could be raised about prior reasons.

Below is an example of a coordinative argument. In the example, the two coordinating reasons “It isn’t satisfying to me at all” and “Most organic food is awful” are closely related, yet are too
weak to stand alone. Note that coordinative arguments are denoted by side by side boxes, as well as a lowercase letter placed next to the reason number.

I. “My opinion on organic food is that I don’t like it (SN1). It isn’t satisfying to me at all (SN1.R1a). Most organic food is not satisfactory (SN1.R1b)”.

Coordinative Argument (I)

At times, writers may include multiple coordinating reasons in the same sentence. These multiple reasons should linked by a coordinating junction (e.g., “and”, “or”). Each of these multiple reasons should be analyzed as separate elements in the argument structure. Below are examples of multiple reasons in one sentence:

II. “In my opinion organic food is more healthier than other food (SP1). Organic meat, eggs, and dairy products come from animals that don’t use antibiotics (SP1.R1a) or hormones (SP1.R1b)”.

III. “I think organic food is good (SP1) because it is produced as natural as possible, (SP1.R1a), free from transfat (SP1.R1b).”

Coordinative Argument - multiple reasons in a sentence (II, III)

In the example (II) above, the “or” serves as a coordinating junction between the two reasons. The second coordinative reason (e.g., “hormones”) is dependent on the first coordinative reason (e.g., “organic meat, eggs and dairy products come from animals that don’t use antibiotics”). The string “organic meat, eggs and dairy products” is not broken-up into separate units since it represents the writer’s single point (i.e., reason) with elaboration.
The coordinative reasons “organic meat, eggs and dairy products come from animals that don’t use antibiotics” and “hormones” are split at the coordinative junction “or”. The term “or” serves as a discourse marker for coordinative arguments (although not all coordinative arguments have discourse markers).

In example (III), the comma serves as a discourse marker for multiple coordinative reasons in one sentence.

**Subordinative arguments** consist of a standpoint and a series of reasons that represent an argument for the preceding reason. Subordinatively, each succeeding reason is a layer in the argument that defends the preceding reason. Layers are added until the defense of the viewpoint is solid. Subordinative arguments can be presented either *progressively* or *retrogressively*. Subordinative arguments are denoted by the number of reasons under the original reason, separated by a period (e.g., R1.R1)

IV. “Organic food is a great way for us to live longer, healthier lives (SP1). It can help stop the problem of Global Warming (SP1.R1), which is changing our planet dramatically (SP1.R1.R1), this by not polluting the atmosphere that helps control the weather (SP1.R1.R1.R1)”.

**Subordinative Arguments - Retrogressive Presentation (IV)**

In a retrogressive presentation, the reason that “clinches” the argument is given last, with a chain of reasoning that leads to this argument. A retrogressive presentation involves *superordination* because the reason that provides the base of support for the other reasons in provided last.

**Subordinative Arguments - Progressive Presentation (V)**

In a progressive presentation, each succeeding reason can be taken as an argument for the preceding reason. The final reasons of progressive arguments are difficult to challenge.

V. “Organic food is a great way for us to live longer, healthier lives
(SP1), this by not polluting the atmosphere that helps control the weather (SP1.R1). It can help stop the problem of Global Warming (SP1.R1.R1), which is changing our planet dramatically (SP1.R1.R1.R1)."

It is important to distinguish between coordinative and subordinative arguments. In many cases, writers will use both coordinative and subordinative arguments in support of their standpoints. To score an element subordinative, consider if the elements includes as “causal” link (whether it be explicit or inferred). If the essay contains no other evidence of subordination or elaboration of reasons, and there is no clear marker for subordination in the string of reasons (e.g. “therefore”), the reasons should be scored as coordinative. Below is an example:

VI. “Why People Should buy Organic Food (SP1). Organic food keeps chemicals out of the air (SP1.R1a) water (SP1.R1b) soil (SP1.R1c) and more importantly out of our bodies (SP1.R1d).”

VII. “Organic food is expensive, but good in a way, healthier food (SP1). Food that uses pesticides has many chemicals to kill the bacteria (SP1.R1a) or the pest that live in the food (SP1.R1b). Such chemicals that are used on food is also bad for us if we consume large quantities (SP1.R1c).”
Writers may include *if/then clauses* in the subordinate and coordinative arguments in the argumentative essays. And *if*/*then* clause begins with a particular condition (*if this happens*) or set of conditions (*if this happens and this other thing happens*), and ends with a consequence of those conditions (*...then this will happen*). The general rule is that when a writer uses an *if*/*then* structure in the essay, then the argument should stay as one single unit and should not be broken up further. Said differently, what goes in the graphed unit is the whole *if*/*then* structure. Note: weak writers sometimes fail to include both the terms “*if*/*then*”, despite the interdependent/casual argument. Be mindful of “*if*/*then*” arguments, and be sure to score these as subordinative. For example:

**VIII.** *“I think if organic food is healthy then have organic food (SP1). If it you can stay healthy, you will be happy (SP1.R1).*

Note that the writer included an *if*/*then* clause in both the standpoint and reason statement. Each of the *if*/*then* clauses should be kept as complete units, rather than be broken up within the *if*/*then* clause (e.g., if it you can stay healthy // you can be happy).

**If/then Clause (VIII)**

Also note that in this example, the writer did not include the word “*then*” in the reason component. Despite this omission, the phrase is still considered an *if*/*then* clause.
If/then Clause (IX)

IX. “In my opinion, I don’t believe there is a health factor between organic food and regular produce (SN1). All produce has to meet the same quality (SN1.R1a) and safety standards before sold (SN1.R1b). If by any chance there is any left over pesticide on conventional food it can be washed off before use (SN1.R1c). There has been research providing that if any case of pesticide is in fact left on food it is not an increased cancer risk (SN1.R1d).

Explanation of Graph:

- “All produce has to meet the same quality” and “safety standards before being scored” are graphed as coordinative strings because they are inter-related. The sentence is broken up into two units because “quality” and “safety” can be considered different yet related characteristics of standards measured before organic food is sold.

- There are two “if/then” clauses present above. The “if/then” clauses of “If by any chance there is any left over pesticide on conventional food it can be washed off before use” and “...if any case on pesticide is in fact left on food it is not an increased cancer risk” are kept as one unit, even though they don’t include the word “then”. They are scored coordinatively since they add elaboration to the original coordinative string.

Multiple Arguments

Writers often include more than one argument in an essay. Multiple arguments usually consist of more than one reason for the same standpoint. These reasons do not depend upon each other to support the standpoint (otherwise, the arguments would be considered coordinative). Each of the reasons is independent of each other and carries roughly equal weight in the defense of the standpoint. In practice, it is often difficult to distinguish between multiple and coordinative reasons. The guiding rule is that if there is a degree of subordination below a reason, then that reason should be scored a multiple reason.
Discourse markers may be a helpful way to distinguish between multiple and coordinative arguments. Such discourse markers may include: “first”, “second”, “third”, which indicate the present of a multiple argument. Discourse markers for coordinative arguments include: “and”, “or”, “,”.

Multiple arguments should follow the writer’s original standpoint (e.g., if the argument lies in contrast with the original standpoint, then it will likely be considered a counterargument or an alternative argument). The boxes are delineated by the standpoint (SP) followed by the number of reasons (SP1.R2). The reasons that are placed below the second (multiple) standpoint is demarcated by starting with R1. For example, multiple subordinative arguments and one coordinative string will be listed as follows:

Below is an example of a multiple argument:

1. “My opinion for organic foods would be that I don’t mind spending the extra money (SP1). Any healthy active person would choose organic food over any other types of food (SP1.R1) primarily because it’s healthier (SP1.R1.R1). For any athlete having an edge or advantage over something especially food would be a plus (SP1.R1.R1.R1). Spending an extra few bucks to eat something healthier should never be an option (SP1.R2). Knowing that I’m eating something that has chemicals to kill insects just to save a couple of bucks wouldn’t make me happy
(SP.R2.R1a) let alone my body feeling good (SP.R2.R1b). Organic foods are more nutritious to eat (SP.R2.R1.R1).”

The two main reasons that the writer provides to support his/her standpoint are: “Any healthy active person would choose organic good over any other types of food” and “Spending a few extra bucks to eat something should never be an option”. Note that there is a discourse marker, “because”, which indicates that the writers provides a subordinative (e.g., causal) argument to expand upon the first reason. The second reason contains both subordinative and coordinative elements.

**Alternative Standpoints**

An alternative standpoint is the presented position that is directly opposed to the writer’s stated standpoint. The alternative standpoint directly contrasts with the standpoint that the writer is advancing. In general, alternative standpoints are usually argued against (i.e., the writer will often attempt to strengthen the case for his/her standpoint by weakening the case for the alternative proposition). The following is an example of an alternative standpoint:
I. “I think that organic food is healthier than regular food (SP1). This is because it has no harmful pesticides on it (SP1.R1) Some people might disagree that organic food is not any healthier than regular food (AS1).”

Alternative Standpoint (I)

Counterarguments

A counterargument is a criticism or objection that could be used to undermine a person’s standpoint. In a real argument between two people, a person who holds an alternative standpoint could make counterarguments to the standpoint of the other person. In written arguments, counterarguments are described as potential criticisms of the writer’s standpoint and as support for the alternative viewpoint. It is important to note that counterarguments can occur, even if the argument does not closely relate to the writer’s initial (e.g., “myside” argument).

The following in an example of a counterargument (CA), followed by a rebuttal (RB) and coordinating reasons (R1a; R1b):

I. “I don’t care for organic foods (SN1) because it’s expensive (SN1.R1). And people say it’s healthy (SN1.R1.CA1), but I don’t see the difference (SN1.R1.CA1.RB1).

Counterargument (I):
In the example above, the writer provides a negative standpoint, and a reason to support the standpoint, as well as a counterargument, a rebuttal, and two reasons to support the rebuttal.

As in coordinating arguments, counterarguments may be graphed side-by-side if the writer includes compound predicates. Counterarguments therefore can occur as “coordinative counterarguments”. An example of a coordinative counterargument(s) is included below:

II. “First thing that comes to mind about organic food is that it is healthy (SP1). I think it’s healthy because organic food is produced by farmers who make sure of renewable sources (SP1.R1) ... The FDA makes no claims if organic food is healthier (SP1.R1.CA1a), or safer for that matter (SP1.R1.CA1b). Organic food is sometimes different depending on how it is grown (SP1.R2a), handled (SP1.R2b), and processed (SP1.R2c).

Counterargument (II)

In the example above, the writer provides a counterargument to the claim that organic food is healthier (e.g., counter argument is that FDA makes no claim that organic food is healthier). The coordinative elements include “healthier” and “safer”. Although the second counterargument is less clear, it appears that the writer is presenting a counterargument to the claim that organic food is healthier (e.g., organic food is sometimes different, i.e., not as healthy, depending how it is grown, handled, and processed). The writer’s inclusion of “grown”, “handled”, and “processed” represent coordinative markers in the counterargument.
Rebuttal

A rebuttal is a statement that refutes or undermines an alternative standpoint, counterargument, or reasons for counterargument/alternative standpoint, and thereby strengthens the writer’s standpoint. A rebuttal can be expressed in two ways: (a) opposition to an explicit expression of an alternative standpoint and associated reasons; and (b) opposition to an explicit expression of a counterargument leveled against the writer’s standpoint and in support for the alternative standpoint.

The following in an example of a rebuttal that opposes an explicitly stated standpoint point by providing a counterargument and rebuttal to the counterargument.

I. “My opinion on organic food is that I don’t like it (SN1).... Yes they are healthy (SN1.CA1), but they have no flavor at all (SN1.CA1.RB1).”

Rebuttal (I)

In the example above, the writer provides a rebuttal (“but they have no flavor at all”) to the counterargument that organic food is healthy, (“yes, they [organic foods] are healthy”). Although the content of the rebuttal does not explicitly target the writer’s counterargument, it does serve to weaken the counterargument (e.g., people may not eat organic food because it has no flavor).

A rebuttal must do more than simply express doubt about an alternative standpoint or counterargument. It must actually undermine or weaken the standpoint of the counterargument. Statements that express doubt but do not actually rebut the alternative standpoint or counterargument should be scored as a nonfunctional unit.

I. “Organic food is just about as good as regular food (SP1). It can be known that it is healthier (SP1.CA1) but, organic and regular food do the same thing (SP1.CA1.RB1). That 1st to put food in peoples stomach (NF).
Nonfunctional Unit

Nonfunctional (NF) elements include: (a) repetitions, and (b) other information that does not appear to be relevant to the topic. Any unit that does not appear to play a role as a standpoint about the topic, reason(s) for the standpoint, alternative standpoint, counterarguments, rebuttals, reasons(s) for the rebuttal, introduction, and conclusion are scored as nonfunctional. Also, if the writer provides illegible or nonsensical information, it should be scored as nonfunctional.

Verbatim (exact) repetitions are scored as nonfunctional repetitions (NF) unless they are used for emphasis or serve some function in the essay.

Below are several examples of nonfunctional units:

Nonfunctional Unit (I):

1. “I believe there isn’t a real difference between organic and regular food (SN1). To honest, whatever (NF). If anyone wants to talk about health you could say nothing out there is healthy for you (SN1.R1)”

In the example above, the writer includes two nonfunctional units: “What makes food Organic” and “to be honest I never had organic food and I don’t plan to”. The first statement is incomplete, and therefore graphed as nonfunctional. The second statement does not provide a clear reason or elaboration that expands upon the writer’s original standpoint (i.e., “there isn’t a real difference between organic food and regular food). Rather, it provides personal information about the author and does not contribute to the writer’s argument that there is no difference between organic food and regular food.

At times, writers may provide a large portion of text that is incoherent and/or divergent from the original standpoint topic. This lack of incoherence and irrelevant topic matter can make graphing the text extremely difficult. If this situation arises, then the entire portion that is incoherent or divergent text section should be scored as nonfunctional (see example below).
Large portion of text graphed as Nonfunctional Units (II):

II. “Organic food is expensive, but good in a way, healthier food (SP1). Food that uses pesticides has many chemicals to kill the bacteria (SP1.R1a) or the pest that live in the food (SP1.R1b). Such chemicals that are used on food is also bad for us if we consume large quantities (SP1.R1.R1). The same pest that eat the harvest also kill worst pest that can be more dangerous if consumed by a human (NF). A good thing about pest is that when they die and fall to the first of the harvest, it works like a fertilizer (NF). Pests are not that big if a problem only problem about them is that they can ruin the whole harvest (NF). Organic food is clean of pest and healthier (C). Its expensive (SP1.R1.CA1)(C) but in some terms its better to eat organic food (SP1.CA1.RB1)(C).”

It is important to note that relative (e.g., poor) quality of a reason or elaboration is not a reason for scoring it as nonfunctional. Any textual material, not matter how weak, which serves a purpose in the argument is scored as a functional unit. For example, in the graph below, the reasons that support the counterargument are very weak and do not directly relate to the writer’s counterargument. However, the propositions serve a purpose for the writer’s argument and add elaboration to the counterargument – albeit a weak elaboration.
Weak Reasons/Elaborations, rather than a Nonfunctional Unit (I):

1. “I don’t care for organic foods (SN1) because it’s expensive (SN1.R1). And people say it’s healthy (SN1. R1.CA1), but I don’t see the difference (SN1.R1.CA1.RB1). I rather just stick to fruits (SN1.R1.CA1.RB1.R1a) and vegetables if you want something (SN1.R1.CA1.RB1.R1b)”.

In the example above, the statement “I rather just stick to fruits and vegetables if you want something” is an example of weak reasons or elaborations rather than nonfunctional units. It contributes to the argument, though it is not explicitly stated that the writer will choose non-organic fruits and vegetables (though it is presumed so).

Functional Marker

A functional marker serves a particular purpose for the writer, and is often used as a transition to introduce reasons, arguments, and standpoints. Since it serves a particular purpose, it is not considered nonfunctional. Further, it is not considered a rhetorically functional repetition, since
it does not restate previous argument. Rather, a functional often serves to introduce upcoming statements and provides a transition to the writer’s upcoming argumentative elements.

For example,

**Functional Marker**

I. “Growing organic food is healthier for you (SP1). On the organic consumers Association’s website it says that by the year 2020, markets will sell organic foods (SP1.R1). Why are they doing this? (FM) because many Americans consider organic food to be more healthy then the food markets get sick was probably tested with pesticides (SP.R1.R1). These are many reasons why people love organic food (FM). More people are turning to organic food because they prohibit the use of genetic engineering (SP1.R2a), pesticides (SP1.R2b), chemical fertilizers (SP1.R2c), hormones (SP1.R2d) & animal drugs (SP1.R2e). All of those things could be found in 77% of non-organic foods (SP1.R2.R1). And that is why many Americans are switching (SP1.R2.R1.R1). No one wants those toxins in your body. (SP1.R2.R1.R1.R1).
Rhetorically Functional Repetitions

Rhetorically Functional Repetitions (RFR) occur when the writer restates previously expressed reasons, arguments, or standpoints. Some of these repetitions are rhetorically effective, but they don’t necessarily add to the breadth or depth of the argument. Since a RFR serves a discernable rhetorical purpose, it cannot be scored as a nonfunctional unit. The wording and content should be extremely similar to the original statement; otherwise, the RFR may be considered as an additional reason, argument, standpoint, etc.

1. “Organic food is a great way for us to live longer, healthier lives (SP1). It can help stop the problem of Global Warming (SP1.R1), which is changing our planet dramatically (SP1.R1.R1), this by not polluting the atmosphere that helps control the weather (SP1.R1.R1.R1). Organic food is helpful because it stops Global Warming (RFR).”
Introduction

An introduction is defined as a foreshadow to what is to follow in the writer’s presentation of the argument. It may outline the writer’s purposes, goals, or what the reader can essay. Introductions may be one sentence long, whereas others may be several sentences long. As with any category, not all essays have an introduction. The following is an example of an introduction:

Introduction (I):

I. “Today in our world our food source comes mainly in two forms. These forms are known organic and non-organic foods. Most people including myself would like to eat organic foods due to their health factors. It is my personal opinion that foods that grown directly using natural fertilizer are more healthier than food which grown using chemicals and fertilizers (I)(SP1). One specific reasons that I can give you is the difference of taste between organic egg and fresh organic milk (SP1.R1)”

In the example above, the entire statement, “Today in our world our food source come mainly in two forms. These forms are known organic and non-organic foods. Most people including myself would like to eat organic foods due to their health factors. It is my personal opinion that foods that grown directly using natural fertilizer are more healthier than good which grown using chemicals and fertilizers (I)(SP1)”, is considered the introduction. Also note that the writer includes his/her standpoint in the introduction.
As such, writers sometimes include an introduction that contains information that is subsequently used to develop the argument later in the essay (such as standpoints, reasons, counterarguments). When this happens, the necessary information that is needed to complete an analysis of the argument’s structure should be extracted and the writer should still be credited for writing an introduction.

**Conclusion**

A **conclusion** is present when the writer gives a closing to what is written (i.e., “bring everything together”). If a writer writes “the end”, this is scored as a conclusion.

In addition if the writer writes a conclusion (“That is why organic food is healthier than regular food”) followed by “the end” then the entire statement is graphed as a conclusion. As with any category, not all essays have a conclusion. The following are examples of conclusions:

**Conclusion (I):**

1. “**Organic food is good for your health, but I don’t think you should eat it all the time (SN1). You should be healthy and eat it sometimes cause your body needs that kind of nutrients that regular foods don’t have in it (SN1.R1). I feel that organic food is too expensive (CA1), but a lot of people want it to be healthy (CA1.RB1) and not gain a lot of weight (CA1.RB2). Everyone should eat regular and non organic food cause your body needs other nutrients that organic food does not have (C).**”
Sometimes writers introduce “new information” in the conclusion that was not previously discussed in the essay. See example below.

Conclusion with additional information

II. “Organic food is expensive, but good in a way, healthier food (SP1). Food that uses pesticides has many chemicals to kill the bacteria (SP1.R1a) or the pest that live in the food (SP1.R1b). Such chemicals that are used on food is also bad for us if we consume large quantities (SP1.R1c). The same pest that eat the harvest also kill worst pest that can be more dangerous if consumed by a human (NF). A good thing about pest is that when they die and fall to the first of the harvest, it works like a fertilizer (NF). Pests are not that big of a problem only problem about them is that they can ruin the whole harvest (NF). Organic food is clean of pest and healthier (SP1.R1.CA1)(C). Its expensive but in some terms its better to eat organic food (SP1.R1.CA1.RB1)(C).”

In the example above, the writer includes “new” information, as well as previously stated information. The writer previously discussed the notion of pests and health as reasons; however, the writer introducing the element of cost for the first time in the essay. Therefore, it is important to account for this element in the graph (in addition to the conclusion). The last two sentences of the writer’s essay are considered a conclusion because the writer appears to be closing and “wrapping up” the essay with the inclusion of these sentences.
**Functional Units**

- Standpoint (SP, SN)
- Alternative Standpoint (AS)
- Reason (R)
- Counterargument (CA)
- Conclusion (C)
- Introduction (I)
- Rhetorically Functional Repetition (RFR)
- Rebuttal (RB)
- Functional Marker (FM)

**Nonfunctional Units**

- Nonfunctional Unit (NF)
Appendix F
Score Sheet for Argumentative Essays

______________________________

Information
Participant #:_____________   Section:_________________
Site:_____________            Semester:_________________

Quality of Argumentative Essay
Score of 0 - 7 (#):________

Coherence
Coherence Score (0-3)_______

Cohesion
Cohesion Score (0-3)_______   Cohesive Ties (#)_____
Proportion of Cohesive Ties/# of Sentences (%)_____

Length of Essay
Number of Words (#)________   Number of Sentences (#)______

Functional Argumentative Elements in Essay:
“My side” Functional Elements
Writer’s Standpoint(s) – “My side” (#):_______
Level 1 Reasons for writer’s standpoint(s) (#):_____
Reasons below Level 1 for writer’s standpoint(s) (#):_____

“My side” Total Score (#):_______

“Your Side” Functional Elements
Counterargument(s) (#):________
Rebuttal(s) (#):________
Alternative Standpoint(s) (#):_____

“Your side” Total Score (#):_______

“Extra” Functional Elements
Introduction (0 = Not Present or 1= Present):_______
Conclusion (0 = Not Present or 1= Present):_______
Title (0 = Not Present or 1= Present):_______
Functional Markers (#):________

“Extra” Total Score (#):_______

“Nonfunctional” elements (repetitions, non-relevant information) NF Total Score (#):_______
Appendix G

Guidelines and Scoring Examples for Coherence Scale

Coherence Scale (Adapted from De La Paz, 1995)

Score = 3. The essay is completely organized according to a plan that is sustained throughout the essay. Structure and unity among ideas is strongly evident with no wandering from the primary theme or plan.

a. If student only considers one point of view but sustains his or her organization, score = 3.
   Topic sentence and concluding sentence must support each other.

b. If student considers two sides to an issue by stating the topic, giving support, considering an opposing view, and explicitly rejects at least one opposing reason, plus ends with the same premise, score = 3

Example of a “3”

Organic food, though expensive is better than chemically treated foods, it is because it is grown without pesticides. Also, it could maintain the traditional way of planting that was used by our ancestors even before we know this chemically produced pesticides. In several studies, organic food is proven with less synthetic pesticide residues. therefore making organic foods healthier. Also, in another study, students who switched from organic food, their levels of organophosphorus pesticide exposure dropped dramatically, hence, proving again that organic foods are better. So why would I mind if the food I’m eating is expensive if this foods will be of much help in my body or in my health.

Score = 2. The essay is fairly well organized, with little digression of plan and a clear flow of ideas throughout essay.

a. If student’s premise is logically modified from topic sentence to conclusion, score = 2.

b. If student considers two sides to an issue by stating the topic, giving support, considering an opposing view, but does not explicitly reject opposing view, score = 2

Example of a “2”

Organic food grown without pesticides is much better for the health of ones body. Because pesticides carry a strong amount of toxins that can cause heart disease, cancer, respiratory problems and other changes in the body. It is also been shown in Government studies that pesticides can also be harmful to animals such as birds, deer, and other small animals. In some counties the use of harmful pesticides have been bands.
Score =1.  Writer shifts topics, from one side to the other or has redundant ideas, and lacks a clear flow of ideas.
   a.  If student considers one side of argument, and includes inconsistent or incongruent information, score = 1.
   b.  If student considers two sides but goes back and forth from one side to another, and doesn’t refute last argument, score =1.
   c.  If student provides contradictory information or discrepant ideas, and doesn’t clarify the argument(s), score = 1.

Example of a “1”
I think that organic food is good for you. It might be expensive, but you need to feed your body the right way. Depending on what you eat can determine your health.

Score =0.  Lack of a plan.  Writer either lists ideas or digresses substantially from topic sentence or prompt.

Example of a “0”
The body needs six different nutrition to stay Healthy and working. Many people are to busy, and don't take the time to eat properly, this can cause a shorter life span, cancer, and ageing of the skin. The six kinds of major nutrition are carbohydrates, lipids, vitamins, minerals, and water. Water sounds like not a big deal but it actual take up 60 percent of volume of the food we eat. The carbohydrates are the sugars and starches we eat which come from plants. The most dietary substances are Lipids which is the saturated fats we eat. vitamins come in various forms, our body needs these to prevent cell damage and other affects to the body. Unfortunately we do not have all of what we need in a day, that’s why having a healthy diet is good. The human body needs all these nutrition and more. Research on organic food could help to keep your body alive and healthy.
Appendix H

Guidelines and Scoring Examples for Cohesion Scale

Cohesion Scale, Adapted from De La Paz (1995)

Score = 3. Writer skillfully uses cohesive ties to link sentences together and connect flow of ideas through the use of transitions. There are very few or no errors of cohesive ties, in approximate proportion to the length of the essay.

a. Essay includes varied use of cohesive ties
b. Essay contains at least 1 or 2 cohesive ties, in approximate proportion to the length of the essay.

Example of a “3”
My opinion on organic food is that is it may me healthy for you, but it’s still bad for you. One reason that it is bad For you is because it still has the same Fat, sugar, etc., just not as much. Another reason is because if it has the same bad stuff that regular food has that why should we pay more. Also organic Food taste not as good. This is what I think about organic Food.

Score = 2. Writer uses some cohesive ties to link sentences together. May contain a small number of errors that do not interfere with fluency – about one error for every two sentences is tolerated.

a. Essay contains at least one cohesive tie, in approximate proportion to the length of the essay.

Example of a “2”
My opinion of organic food is healthy then non-organic food. The reason are that its don’t use pesticides that can cause cancer. By not using pesticides are environment is not being polluted as much. Organic food taste better then food that use pesticides during food are healthier.

Score = 1. Writer uses few cohesive ties to link sentences together. Sentences may only be minimally linked together. Essays have several errors and lack control – up to one error per sentence is tolerated.

Example of a “1”
I think that organic food is healthy for the human body. You don’t have to worry about pesticides doing harm to your body.
Score = 0. Writer uses no cohesive ties and sentences do not seem connected or linked together. If cohesive ties are used, they are used incorrectly and contain errors that disrupt meaning or clarity of the sentences.

Example of a “0”

Organic food is really good for your health. There is like no calories in it. Its good because it’s not fattening. you do also need other food that is not organic though because you still need meat for some calories. you are not always supposed to have organic food but you can live just off of organic food. Organic has good vitamins for you but you need other foods other than organic to get all the vitamins you need for your body.

Fat foods are not good for you at all but they are ok some times to get your sugar up. Organic food makes your body healthy and you loose weight b/c there aren’t many calories in organic foods.
Appendix I

List of Cohesive Ties, Adapted from De La Paz (1995)

1. **To introduce ideas:** I believe that, I think that, I think if, First thing, I enjoy, my opinion

2. **To add supporting ideas:** a reason to support this is, for instance, for example, moreover, furthermore, also, in other words, besides, the main reason, secondly, I personally, a good thing, on the website, according to

3. **To refute an earlier idea:** conversely, however, still, nevertheless, on the other hand, even though, unlike, although

4. **To show a conclusion or consequence:** for these reasons, therefore, it follows that, consequently, so, as a result, in conclusion, finally, thus, those are some of the reasons, this indicates

Potential Problems with Using Cohesive Ties

A) **Improper Use of Conjunctions:**

   1) Subordinative Links – which, therefore, as if, because, whenever, however, wh-words (e.g., whenever I go to the mall, I buy an ice cream cone)

   2) Coordinative Links – and, but, or, for, nor

Types of errors:

a. Wrong meaning

b. Receptive use of a conjunction

c. Starting sentences with a conjunction “And…” or “But…”

B) **Other cohesive ties** includes phrases such as “on the other hand” “in conclusion” “I think that”

Possible errors:

a. Wrong meaning (such as ”on the other hand” for “in conclusion”)

b. Repetitive use of a phrase
Appendix J

Inter-Rater Reliability (n=45), as measured by Cohen’s Kappa Coefficients and the Intraclass Correlation Coefficients, ICC

<table>
<thead>
<tr>
<th>Variable</th>
<th>$k$</th>
<th>ICC, Cronbach’s $\alpha$</th>
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</thead>
<tbody>
<tr>
<td><strong>Holistic Rating</strong></td>
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<tr>
<td>Coherence</td>
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<td>Quality</td>
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<td>Reasons Below Level 1 for author’s standpoint(s)</td>
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<td>“Yourside” functional elements</td>
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<td>Functional elements, total</td>
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<tr>
<td>Nonfunctional elements, total</td>
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*Note.* For all values, $p < .001$