Research Article

Placing Writing Tasks in Local and Global Contexts: The Case of Argumentative Writing

Hannah Ringler, *Carnegie Mellon University*

Beata Beigman Klebanov, *Educational Testing Service*

David Kaufer, *Carnegie Mellon University*

Structured Abstract

- **Background:** Current research in composition and writing studies is concerned with issues of writing program evaluation and how writing tasks and their sequences scaffold students toward learning outcomes. These issues are beginning to be addressed by writing analytics research, which can be useful for identifying recurring types of language in writing assignments and how those can inform task design and student outcomes. To address these issues, this study provides a three-step method of sequencing, comparison, and diagnosis to understand how specific writing tasks fit into a classroom sequence as well as compare to larger genres of writing outside of the immediate writing classroom environment. By doing so, we provide writing program administrators with tools for describing what skills students demonstrate in a sequence of writing tasks and diagnosing how these skills match with writing students will do in later contexts.
- **Literature Review:** Student writing that responds to classroom assignments can be understood as genres, insofar as they are constructed responses that exist in similar rhetorical situations and perform similar social actions. Previous work in corpus analysis has looked at these genres, which helps us as writing instructors understand what kind of constructed responses are required of students and to make those expectations explicit. Aull (2017) examined a

corpus of first-year undergraduate writing assignments in two courses to create "sociocognitive profiles" of these assignments. We analyze student writing that responds to similar writing tasks, but use a different corpus method that allows us to understand the tasks in both local and global contexts. By doing so, we gain confidence and depth in our understanding of these tasks, analyze how they sequence together, and are able to compare argumentative writing across institutions and contexts.

- **Research Questions:** Two questions guided our study:
    1. What is the trajectory of skills targeted by the sequence of tasks in the two first-year writing courses, as evidenced by the rhetorical strategies employed by the writers in successive assignments?
    2. Focusing on the final argument assignments, how similar are they to argumentative writing in other contexts, in terms of rhetorical profiles?
- **Methodology:** We first conducted a local analysis, in which we used a dictionary-based corpus method to analyze the rhetorical strategies used by writers in the first-year writing courses to understand how they built on each other to form a sequence. Having understood what skills students are demonstrating in a course, we then conducted a global analysis which calculated a "distance" between the first-year argument writing and a corpus of argument writing drawn from other contexts. Recognizing that there was a non-trivial distance, we then identified and evaluated the sources of the distance so that the writing tasks could be assessed or modified.
- **Results:** The local analysis revealed eight key rhetorical strategies that student writing exhibits between the two first-year writing courses. With this understanding, we then placed the argument writing in global contexts to find that the assignments in both courses differ somewhat from argument writing in other contexts. Upon analyzing this difference, we found that the first-year writing primarily differs in its usage of academic language, the personal register, assertive language, and reasoning. We suggest that these differences stem primarily from the rhetorical situation and learning objectives associated with first-year writing, as well as the sequencing of the courses.
- **Discussion:** The three-step method presented provides a means for writing program administrators to describe and analyze writing that students produce in their writing programs. We intend these steps to be understood as an iterative process, whereby writing programs can use these results to evaluate what rhetorical skills their students are exhibiting and to benchmark those against the program's goals and/or other similar writing programs.

- **Conclusions:** By presenting these analyses together, we ultimately provide a cohesive method by which to analyze a writing program and benchmark students' use of rhetorical strategies in relation to other argumentative contexts. We believe this method to be useful not only to individual writing programs, but to assessment literature broadly. In future research, we anticipate learning how this process will practically feed back into pedagogy, as well as understanding what placing writing tasks into a global context can tell us about genre theory.

Keywords: argument, diagnostic, distance, first-year composition, genre, measurement, rhetorical profiles, rhetorical strategies, sequence, student writing, text analysis, writing analytics

1.0 Background

Evaluating writing programs and whether program outcomes match with the writing expectations of students moving into the workplace, and transfer into other contexts is a key issue in writing and composition research (Allen, 2004; National Research Council, 2012). Research has recently investigated how to determine if writing programs are meeting outcomes (Allen, 2004), how well program outcomes match employers' desired skills (Thomas & McShane, 2007), and if writing skills taught in the classroom are an accurate reflection of those expected in other contexts (Wolfe, 2009). In sum, writing programs are increasingly tackling issues relating to program evaluation. While evaluating program outcomes is a complex challenge for writing and composition programs, it is important for writing courses to maintain their usefulness to students' development towards their future career goals and overall literacy.

One way that writing programs might evaluate their programs is through a careful analysis of writing task design. The National Research Council (2012) explains that for students to develop "21st century skills," there must be a focus on how skills learned in the classroom transfer to new contexts. As part of this move towards transferable skills, they specifically recommend that instructional designers focus on clear learning goals and ways to measure students' progress toward those. The present study thus suggests that by increasing our focus on how we design writing tasks, we might better prepare students for transferring their skills elsewhere through both more precise skill development and increasing metacognitive awareness of those skills.

Writing analytics and corpus analysis tools offer one promising set of methods by which to address these task design and evaluation issues. Most frequently, corpus analytic methods have been useful in identifying patterns or types of language that recur across successful student texts, including register features (Brown & Aull, 2017), rhetorical moves (Cotos et al., 2015), and "co-occuring, lexicogrammatical features" (Hardy & Römer, 2013). Identifying these patterns can be useful for making task requirements explicit to students, as well as for more precisely identifying tacit or otherwise unclear task requirements. Aull (2017) recently demonstrated how identifying recurring types of language can be useful for explicating genres of writing tasks and raising questions about task design. This sort of data can be useful for feeding back into program evaluation, as it reveals new information about the skills that students actually develop and perform in the classroom.

In this project, we continue in the vein of bridging corpus analysis methods with writing task design. Our primary contribution is a three-step method for analyzing student writing to place writing tasks in "local" and "global" contexts. In terms of "local" context, we analyze how the writing tasks in one first-year writing course build on each other and fit into a sequence in the local context of the classroom, demonstrating how writing tasks are designed to build students' skills over time; by "global" context, we focus on students' argument writing to provide a means to understand how the argument writing that students do in the classroom compares to similar argument writing that students might do in future, more global, contexts. We see this method as primarily descriptive and diagnostic in function: it allows the analyst to describe at a fine granularity the rhetorical strategies that students use to successfully complete their written assignments, to compare those to writing students might do outside the classroom, and to diagnose the possible sources of difference. By doing so, we provide measures and an analysis that we believe writing programs could use in future steps to consider how student outcomes align with desired program outcomes and writing tasks in other contexts. While we do not suggest that this method fully answers the composition research issues regarding program evaluation and transfer described above, this method does provide writing program administrators with tools for understanding student practices and bringing to their awareness how specific writing tasks fit into a sequence and match with similar writing students might do in their future careers.

2.0 Literature Review

2.1 Writing Assignments as Genres

The writing assignments given in first-year writing vary widely, from the popular "argument" paper to less common program-specific assignments. According to Bennett (1991), student responses to these assignments are constructed in that the students must demonstrate their ability to fulfill the task requirements. In this sense, students' written assignments respond to their rhetorical situations, and "similar, recurring rhetorical situations" allow us to categorize assignments into genres (Melzer, 2009, p. 243). Other composition research has explored treating writing assignments as genres, considering how doing so allows us to better understand the "social actions" (Miller, 1984) that these genres perform and how students enact those (Devitt & Reiff, 2014; Soliday, 2011). These assignment genres—the "argument" paper being one—hold other properties of genres including being "relatively stable types" of utterances and existing at various levels of abstraction in their similarity (Bakhtin, 1990; Simons, 1978). Though assignments as genres vary over time and across institutions and departments, studying student responses to assignments as genres "can shed light on writing expectations that are privileged and recognizable across individual student texts" (Aull, 2017, p. 6). By doing so, we can help to make expectations clearer for both instructors and students, as well as evaluate writing task design (Aull, 2017).

Studying genres is increasingly being approached through corpus analytic methods. In the context of college composition, corpus methods have been used to discuss rhetorical effects in essays (Aull, 2015), how linguistic features combine for rhetorical effect (Jarvis et al., 2003), and writer skill and stance features (Aull & Lancaster, 2014), to name a few. Recently, Aull (2017) drew a connection between corpus analytic methods and writing task design, creating a bridge between writing analytics and composition studies. In that study, she uses a method she describes as "context-informed corpus analysis of lexical and grammatical keywords" to derive assignment task requirements from linguistic features that are revealed in student papers across several assignments from one university's first-year writing classes (p. 4). She begins her analysis by tagging the student texts for part-of-speech and then identifying the lexical and grammatical keywords of each assignment. For these keywords, she calculates a "keyness" value to statistically identify which keywords are most prominent in one corpus of student responses to an assignment as compared to another assignment. Through these lexical and grammatical keyword results, Aull is able to create "sociocognitive profiles" of student writing in assignment genres that "account for discourse patterns, social purposes, genre networks, and stages or processes entailed" (p. 33). These profiles are then useful for understanding what types of constructed responses are required of students, and for helping writing instructors to make those requirements clear to students.

While Aull's methodology is productive in creating these profiles, Geisler (2016a; 2016b) explains that corpus analysis has taken on a host of textual analysis methods, each of which has different limitations and can answer different types of research questions. And by using several methods together, we gain "confidence and depth" in our findings (Geisler, 2016b, p. 523). Because of this, we seek in this project to study a corpus of student texts (similar to Aull's) that received an A grade across multiple assignments from two first-year writing classes, but to use an analysis method derived from rhetorical studies rather than corpus linguistics (Geisler, 2016a). Our analysis uses the Docuscope platform (Ishizaki & Kaufer, 2011) to help us to identify key rhetorical strategies that students draw upon in each assignment. The Docuscope platform and process of identifying rhetorical strategies shares some similarities with Biber's seven dimensions from his multidimensional analysis method (Biber, 1988); however, rather than analyzing based directly on lexicogrammatical variables, the Docuscope platform operates with *rhetorical* dimensions (to be described in Table 1 in section 4.2). In this sense, Docuscope is focused primarily on rhetorical description of texts, rather than, for example, register or assessment of individual student texts (e.g., Crossley, Kyle, & McNamara, 2016; McNamara, Graesser, McCarthy, & Cai, 2014). Because of this, we are able to compare nuanced rhetorical strategies across assignment types in a course.

2.2 Writing Assignments as Sequenced Tasks

By identifying the key rhetorical strategies that are characteristic of student responses to each assignment in a course, we show how the assignments in one course sequence together to build students' skills. Sequencing assignments in this way is a common best practice among writing classrooms and is meant to improve the overall quality of student writing through a structured development (Lindemann, 2001; WAC Clearinghouse, 2006). In addition, sequencing is a key way in which students learn to meet course outcomes, through scaffolding students towards course objectives, which is a complex task for instructors (Jenseth, 1989; Kiniry & Strenski, 1985; Rankin, 1990). Regardless of the instructor's intention towards sequence though, analyzing the rhetorical strategies that students actually display in writing each assignment allows us to more fully understand how students' skills are building on each other in practice as the course progresses.

This analysis of rhetorical strategies, genre, and sequence also allows us to think about the assignments in terms of writing domains, constructs, and skills. White, Elliot, and Peckham (2015) describe how writing constructs can be thought of in part through cognitive, interpersonal, and intrapersonal domains. The cognitive domain includes outcomes like genre knowledge and audience knowledge, and is drawn in part from the WPA Outcomes statement[1] (Harrington et al., 2001). The interpersonal and intrapersonal domains include certain "habits of mind" such as collaboration, leadership, conscientiousness, and agreeableness, and are drawn in part from the *Framework for Success* (CWPA, NCTE, & NWP, 2011) and work on personality factors in writing (National Research Council, 2012). By analyzing rhetorical strategies that students use through their linguistic realizations, we can also begin to see how these strategies point to the types of cognitive outcomes and skills students are developing, as well as the "habits of mind" that might lead them there. These types of connections, too, can be useful for writing program administrators to understand the skills and outcomes that their assignments encourage.

Finally, the focus on sequencing here also provides us with reason to focus upon the final assignment in each class (an argument paper) as most representative of students' skills for comparison across other writing contexts. Overall, this method of analysis allows us to identify the rhetorical strategies that students actually practice in one course and also effectively scales up to a macro-level to help us compare assignments on the level of genre across contexts. By analyzing the corpus with this different methodology, we are able to add "confidence and depth" to Aull's (2017) findings, while also providing new insights about student's strategies, assignment sequence, and the assignments as a genre.

2.3 Comparing Assignments across Institutions

Examining a corpus of first-year writing in the same institution is useful for revealing what specific assignments (or genres of assignments) require of students. In this project, though, we also build on this to ask how we can evaluate genres of assignments across institutional contexts.

[1] The WPA Outcomes statement was updated in 2014 (Dryer et al., 2014).

We ask, what is desirable as a way of comparing writing assignment types across institutions? How does "argument" in one institution measure up against "argument" in another? There have been some efforts in this direction. One approach is to collect and analyze prompts across institutions. Melzer (2009) conducted a review of 2,100 writing prompts across disciplines and institutions, with a focus on understanding the types of rhetorical situations that students are asked to encounter. While his focus is primarily on improving Writing Across the Curriculum (WAC) courses, he explains that looking widely at the similarities and differences among assignments across institutions allows us to critically evaluate the state of our writing assignments. Other researchers have conducted surveys on specific assignment types to understand their prevalence across institutions. Manning's (1961) survey of first-year writing courses (updated twice thereafter) found that 83% require a research paper. Ford and Perry (1982) found that only 78.11% of freshman English courses required a research paper, and Hood (2010) found that of all of the research papers assigned, only six percent were "traditional research papers," while 94% were now "alternative research assignments." These surveys suggest to us as a field where writing programs are focusing their efforts (in this case, somewhere in the realm of argument and research skills), and allow us as individual writing programs to begin thinking about how our students' preparation and skills might compare to students' in other academic contexts.

But while these surveys of prompts or assignment types can give us a sense about where program efforts are focused, they have two key limitations. First, surveys require respondents to choose pre-determined categories for their assignments, which can miss nuanced differences among assignments, especially when it is assumed that respondents do not share identical understandings of what the assignment entails. Second, and relatedly, the semantic labels used to flesh out prompts or writing assignments seriously underdetermine the actual lexicogrammatical behaviors students have exhibited in their finished texts. For example, considering the movement of writing programs from traditional research papers to less-traditional assignments, it is increasingly unclear what "argument" means in these contexts and how writing prompts might represent the concept differently than what appears in actual student writing. These limitations, thus, do not allow us to define the scope of the label or confirm that students are actually producing something called "argument" in one context or another. While some research has recognized these same limitations (Zhu, 2004), we do not yet have a methodology for writing programs to assess how their own students' writing assignments might compare to similar contexts outside of their local course.

To address these many methodological issues in comparing writing assignments across contexts, we sought to construct a way to compare student writing across one assignment type. Using argument assignments specifically, we sought to provide instructors with a way to assess how similar their students' argument papers are to other "argument" writing. While we do not mean to suggest here that argumentative writing must be similar across even university contexts, we do believe it important to be able to critically compare across these contexts for program evaluations. Yancey and Morrison (2006) explain that the vocabulary we use in talking about first-year writing “speak to concepts and to practices that together are the stuff of composition” (p. 268). When we talk about argument, then, which is one of the most common assignment types that occurs in first-year writing, we need a more consistent and absolute way of identifying what this means, what tasks it requires of students, and how our own writing programs implement it in comparison to others.

3.0 Research Questions

In this project, we continue in the direction of connecting corpus analysis and writing task design. Our primary goal is to provide an analytical method for understanding how writing assignments fit into local and global contexts, so that writing programs can better diagnose and evaluate the rhetorical strategies that their students use and how those compare to other contexts. Using a corpus of first-year writing texts, we apply a computer-aided rhetorical analysis method to understand what type of rhetorical strategies students are using across these assignments. Specifically, we ask the following:

> Question one: What is the trajectory of skills targeted by the sequence of tasks in the two courses, as evidenced by the rhetorical strategies employed by the writers in successive assignments?

Answering this first question ultimately complements Aull’s (2017) findings in the two first-year writing courses studied, and allows us to understand the task requirements of these assignments and their sequences in new, nuanced ways by placing them within their local contexts.

After having gained an understanding of the sequence of task requirements, we turn to ask how universities can compare the requirements and skills developed through their writing assignments to other institutional contexts. That is, while the first question allows a writing program to see what it is asking of students, it does not allow program administrators to understand how their assignments might compare to similar assignments of the same type elsewhere. In this project, we specifically focus on the final argument assignment in each course because it both represents the culmination of the course’s sequence of assignments and is one of the most common assignment types across institutions in first-year writing. Thus, we ask the following:

> Question two: Focusing on the student responses to the final argument assignments, how similar are they to argumentative writing in other contexts, in terms of rhetorical profiles?

Answering these research questions in sequence provides a process for writing programs to analyze their assignments locally (within their classroom) and globally (across institutional contexts). In the remainder of this paper, and to answer these research questions, we present three steps through which writing programs can describe the sequence of their assignments, compare their students’ argument writing against other argumentative contexts, and diagnose areas of difference. In this sense, we see this method as primarily descriptive and diagnostic in function, rather than prescriptive or evaluative. With this information in hand, we expect that a program administrator can take future steps to revise their courses as they see appropriate to have students practice desired rhetorical skills that meet the program's overall goals (though demonstrating this revision process is not our primary goal in this work). In sum, this three-step method, and the interplay of these analytical methods, ultimately allows programs to more fully describe what rhetorical skills their students are exhibiting and to benchmark those against the program's goals and/or other similar writing programs.

4.0 Research Methodology

Our primary contribution in this paper is the three-step method we describe here. Step one addresses the issue of placing texts in a local context, and demonstrates how to compare assignments in the same course to identify rhetorical strategies that students draw on and how those sequence together to build on each other. Step two compares the writing assignments from the courses to argumentative writing in other contexts to determine the "distances" between these various types of writing. Step three then diagnoses the sources of these "distances" in order to answer what rhetorical features of the writing assignments differentiate them from other argumentative writing. We describe each of these steps in detail below, after describing our primary data set of student writing assignments.

4.1 Data

The primary data for this study is student writing from two first-year writing courses (ENC 1101 and 1102) at the University of South Florida (USF)[2]. Each course asks students to complete three major writing assignments. For ENC 1101, the three assignments include an annotated bibliography, an essay which traces a scholarly conversation over time, and an argument essay. For ENC 1102, the three assignments include an analysis of visual rhetoric, an essay which asks a student to identify two sides of an argument and propose a solution, and an argument essay.

Our data set started from the final drafts of each of the three assignments in each course from Spring 2016. We used only drafts that were graded as an A-, A, or A+. While we recognize that including more grades (for example, B papers) would have added more variety to our analysis of rhetorical strategies students exhibited, focusing on A papers allows our analysis to only identify features that are positively correlated with the assignment tasks and allows us to assume that these drafts are roughly meeting the requirements of the tasks as desired by the instructors and writing program goals. It is important to note that we are not interested here in the assignment prompts themselves, but rather the actual written rhetorical practices that students engage in to successfully complete the assignment. Additionally, we chose to limit this data set further to only include the papers of those students who wrote all three assignments in a course. Because the

[2] This data was provided to us by the University of South Florida's First Year Composition program. For details on the program's curriculum, please refer to http://writingcommons.org and Moxley (2013). The student papers used in this study had student names removed prior to being sent to the authors of this study and also followed the USF IRB exemption for using student records. Additionally, this data set is similar to the data set used by Aull (2017), with the primary difference being that we chose to use all three assignments from the courses for our analysis, while Aull used only two.

paper draft files were named to include student ID numbers, we were able to remove those students' drafts that did not appear for each assignment. Doing so ensures that our data is consistent across a course and that we are not measuring differences that might be due to different students. In total, we analyzed 159 writing samples in ENC 1101 (53 students) and 279 writing samples in ENC 1102 (93 students).

4.2 Step One: Determine Course Sequence

The first step of our method consists of an analysis on the local level, meaning that we look for rhetorical strategies in individual assignment responses and compare them as a sequence within the course. This analysis begins by analyzing the corpora of student writing with Docuscope, which is a dictionary-based corpus analysis tool that is designed to capture over 40 million linguistic patterns that are categorized by rhetorical effect (Ishizaki & Kaufer, 2011). Table 1 shows the overarching categories of rhetorical effects by which the linguistic patterns are organized.

Table 1

The Categories of Rhetorical Effects that Docuscope Identifies

Cluster name	Cluster definition (Words and phrases signaling)	Expansions/Examples
Personal register	Realms of the cognitive, disclosive, uncertain, reluctant, first person, autobiographical	Cognition (*believe, think*), disclosure (*admit, confide*), confidence (*certainly, sure*), uncertainty (*uncertain, unclear*), reluctance (*have to do it*), self-disclosure (*I confess*), autobiographical *(I always used to*)
Emotion	Positive and negative emotion	Positive affect (*very happy, glad*), negative affect (*have the blahs, distress*), negative affect/anger (anger, *feel rage*), negative affect/sadness (*sad, feel lachrymose*), negative affect/fear (*fear, feel anxiety*)
Assertive/Stressed	Metrical stress/ Emphasis/Importance	Auxiliary verbs as main lexical predications (*it is, they are, there is*), insistence (*it must be, it ought to be*), intensity (*very, keenly*)

Cluster name	Cluster definition (Words and phrases signaling)	Expansions/Examples
Description	Language appealing to the five senses and concrete experience	Visual *(violet*, *sand*, *sparkle*), sound (*murmur*, *groan*, *out loud*), smell (*rancid*, *sweet-smelling*), taste (*salty*, *bitter taste, sugary*), touch (*tactile*, *pinch*, *get feel of*)
Public register	Language invoking public institutions, values, responsibilities (often from French-Latin origins)	Institutions *(*monarchy, military, institutional, bureaucracy, tribunal*)*, positive values *(liberty*, *freedom*, *justice*), *negative values (slavery*, *imprisonment*, *injustice*), responsibilities *(responsibility*, *obligation)*
Academic register	Language invoking disciplinary specialization, general abstraction (often from Greek-Latinate origins) and citation	Expressions ending in Greek suffixes like –logy (*sociology*), –graph (*polygraph*), -ment (*dismemberment*), -ability (*adoptability*), -esia (*kinesia*), abstractions such as *analyze*, *automate*, *paradigm*, *factor*, and citation phrases such as *she found that*, *he said that*, and *they argue that*
Future	Language invoking a future tense or future time	Future tense (*will come*, *will go*), future time (*in the next few years*, *augur*, *project out*, *the coming months*)
Past	Language invoking a past tense or past time	Past tense (*came*, *has come*, *had come*), past-in-future (*will have left by now*), and past time (*antediluvian*, *a few weeks back*)
Personal relations	Relationships between people, positive and negative	Positive relations (*love*, *fond of*, *on good terms with*), positive relations/inclusive (*we all*, *all of us*, *we together*, *united*), negative relations (*hate*, *enemy*, *on bad terms with*), negative relations/apology *(apologize for*, *am sorry for*)
Reasoning	Directing audiences from statement to statement by constructing or blocking inference	Constructive reasoning (*therefore*, *consequently*, *it stands to reason that*), contingent reasoning (*If...then*, *probably*, *most likely*), oppositional reasoning *(it is not the case that*, *rebut*, *refute*, *deny*, *concede*)

Cluster name	Cluster definition (Words and phrases signaling)	Expansions/Examples
Interactive	Interaction focused on attention-getting, inquiry, requesting, follow-ups, prior knowledge, and second person	Attention-getting (*let's roll*), inquiry (*it's curious that, what do we make of this?*), requesting (*they request*), follow-ups (*pursuant to your last message*), prior knowledge (*as you know*), second person (*you, do you*)
Elaboration	Expository elaborators	Generalizations (*all of them, every*), examples (*for example*), exceptions (*but for, exception*), comparisons (*compare, contrast*), coordinators (*and, but, or*), definitions (*define as*)
Reporting	Reporting states, events, places, change, updates	Report states (*being*), events (*instituted, created*), places (*D.C.*), change (*transform, increase, decrease*), updates (happening now, the latest on)
Directives	Directing audiences in a task space, in the manner of instructions or procedures	Imperatives (*do this!*), task assignments (*is assigned*), procedures (*you next scroll*), move body (*lift your hand*), confirm experience (*you should now be seeing*)
Narrative	Directing story, event chains over time	Narrative (-ed) verbs (*conquered*), time shifts (*next week, last month*), duration (for three hours), biographical time (*born, graduated, married, employed, resigned, retired, died*), time-date (*September 11, 2001*)
Character	Persons	Personal pronouns (*he, she*), proper nouns (*Bill, Mary, Amal, Mao*), person properties (*cook, restaurant owner, Republican*)

Note. Each row shows the name of the effect, a definition of what signals the effect, and some examples of linguistic patterns that would be tagged. For more detail on these categories, see Ishizaki & Kaufer, 2011.

For each text in the corpus, Docuscope produces a report of the percentage of the text that is dedicated to each category. We will use the term *rhetorical profile* to refer to such a report for a given essay as well as to a report that shows average percentage per category across a corpus of essays that respond to the same assignment prompt. With this information, we then use principal component analysis to capture the major dimensions of variation in category uses in the data, and subsequent ANOVAs to verify that the chosen dimensions indeed correspond to strategies that vary systematically across assignments. The chosen components proved to be analytically useful as rhetorical strategies, as they represent linguistic features that are consistently working together in an assignment. The rhetorical strategies themselves are interpreted from the components – as analysts, we interpret how we see them working in the texts and label them accordingly.[3] Doing so requires an analyst's judgement, made through reading the texts; we believe our analyses here to be consistent with the assignment responses that we serially read and the expected goals of each assignment. In the analysis, we demonstrate the connection between components and rhetorical strategies, as well as how these strategies build on each other to create a course sequence.

4.3 Step Two: Compare Course Assignments to Outside Contexts

Having analyzed the writing assignments at a local level, the second step of our method asks how similar these final assignments are to argument in other contexts. To do this, we compare the assignments' rhetorical profiles to four other sets of argumentative writing from different contexts, and then compare the "distances" between these sets, using the methodology developed in Beigman Klebanov, Ramineni, Kaufer, Yeoh, & Ishizaki (forthcoming) and Beigman Klebanov, Kaufer, Yeoh, Ishizaki, & Holtzman (2016). This section describes the other argumentative writing corpora we used for this comparison and gives a rationale for those choices, and then explains the mathematical procedure that allows us to calculate distances.

4.3.1 Data. In order to put the target data from courses 1101 and 1102 in a larger context of argumentative writing and writing in other genres, four different sets of writing samples produced under different conditions and contexts were used as the reference data for the study: argumentative writing for tests (assessment writing), course-related writing samples across various genres (instructional writing), course-related argumentative writing samples across academic disciplines (argument across disciplines writing), and opinion articles from various writers (civic writing). We further describe the characteristics of each dataset below.

4.3.1.1 Assessment writing data. We use essays written to two tasks from two different large-scale high-stakes assessments. Both writing tests are designed to assess the students' writing ability, especially in an academic context. The data were obtained from the retired version of the GRE test[4] and from the TOEFL test, and were written between 2006 and 2010.

The essays for the GRE are written in response to the *Issue* task[5] that requires the test taker to evaluate an issue and develop arguments with reasons and examples to support the writer's view on the issue. These essays are scored on a scale of one to six. We used essays that received a five from two independent raters; thus, these writers successfully addressed the task, though their essays were not considered outstanding. We randomly selected one essay per prompt, for a total

[3] Interpreting dimensions from factor and principal component analysis as akin to strategies is a relatively common practice. We use the term "rhetorical strategy" because of Docuscope's focus on the rhetorical dimensions of texts. For other similar examples of this practice, see Biber, 1988; Hart, 2000; and Gray, 2016.

[4] ETS launched the GRE® revised General Test on August 1, 2011.

[5] We chose the *Issue* task because it can be seen as producing an argument, whereas the GRE Argument task involves critiquing an argument. Also, see http://www.ets.org/gre/revised_general/prepare/analytical_writing/issue.

of 112 essays. The selection of a single essay per prompt is intended to maximize the range of topics in the assessment sample and mitigate any topic effects which can influence the distribution of words used as the basis for the quantitative measure used in the study. Similarly, for TOEFL essays that were written to the *Independent* task[6] where test takers have to support an opinion on a topic, we sampled at score level five to identify those essays which met the task (this task is scored on a five-point scale). The two tasks were timed between 30-45 minutes. Each set contains 111 essays with one essay per topic. Using these data, we identify the typical profile of rhetorical categories that characterizes acceptable argumentative writing in the assessment settings, where students are required to write to an impromptu topic under timed conditions.

4.3.1.2 Instructional writing data. We used a set of 552 course-related writing samples in seven genres written during a semester-long advanced graduate course on comparative genres in the English department at Carnegie Mellon University, offered as a part of a M.A. program in professional communication. The seven genres (self-portrait, other-portrait, narrative history, instructions, information, scenic, and argument) were chosen, in part, as a classroom simplified version of the English varieties underlying the original Brown Corpus (Kučera & Francis, 1967), including non-literary and literary texts, descriptive, reportorial, expository, popular, learned, and instructional texts. These data were collected over a span of seven years, 2006-2012, under the same course syllabus and the same instructor.

These samples were written by about 100 different students, each student contributing, on average, 5.5 samples across different genres. The characteristics of each genre were presented and discussed with the students ahead of the assignment, as described in Kaufer and Butler (2000) and Kaufer, Ishizaki, Collins, and Vlachos (2004). The genres were addressed in a predetermined sequence, starting from self-portrait (assignment one) and culminating in argument (assignment seven). Using these data, we identified the typical profile of rhetorical categories that characterizes argumentative writing in this advanced instructional setting, where students are free to choose the topic and have two weeks to write the essay.

4.3.1.3 Argument across disciplines writing data. We used a set of 186 course-related argumentative writing samples, all classified as "Argumentative Essays" in the Michigan Corpus of Upper-level Student Papers Corpus (MICUSP, 2009).[7] The corpus contains grade A papers from a range of disciplines at the University of Michigan, Ann Arbor, written between 2004 and 2009 by final year undergraduates, and first, second, and third year graduate students (114, 31, 21, and 20 papers, respectively). The disciplines represented in the corpus, with counts of papers in parentheses, are as follows: English (65), Sociology (23), Philosophy (20), Political Science (19), Psychology (16), History and Classical Studies (16), as well as fewer than ten papers from each of Natural Resources and Environment, Nursing, Linguistics, Education, Biology, Economics, Civil and Environmental Engineering, and Industrial and Operations Engineering.

[6] See "second task" on p.23 ("Writing Section") in the document https://www.ets.org/Media/Tests/TOEFL/pdf/SampleQuestions.pdf.
[7] http://www.helsinki.fi/varieng/CoRD/corpora/MICUSP/; http://search-micusp.elicorpora.info/simple/

We removed appendices, endnotes, and bibliography from all the papers. The average length of a paper is 2,735 words, with a standard deviation of 1,907.

4.3.1.4 Civic writing data. As an additional dataset of writing in the opinion-on-an-issue genre, we used a sample of *New York Times* (*NYT*) editorials and OpEds. Using a set of *NYT* articles spanning the years 1987-2007 (Sandhaus, 2008), we used the *NYT* topic index to sample a single article per topic, constraining the articles to be shorter than 2,000 and longer than 200 words. We kept track of authors and resampled from the given topic if an article on another topic from the same author had already been selected. If no new author was found for the given topic after ten resampling attempts, the topic was skipped. The dataset contains 920 articles, with a large range of topics and a large variety of authors, including an article on extraterrestrial life by the astrobiologist D. Grinspoon and an article on the New Jersey Devils by Yogi Berra. This corpus underscores the relevance of argumentative (that is, support-a-position-on-an-issue) writing for people from all walks of life in a non-academic context.

It is important to recognize that each of these datasets come from different social situations and have a variety of variables influencing them: GRE writing does not allow time for revising ideas in the same way that M.A. writing does; *NYT* pieces write to a broader public than even M.A. students might. While we recognize the variation, we also maintain that each of these datasets represents “argument” writing in some way. Table 2 shows the distribution of writing samples across sources and genres used in the study.

Table 2

Summary of the Writing Samples and Genres Included in this Study as Argumentative Writing

Source	Dataset	# of responses	Mean (words)	Std. dev (words)
Instructional	Self-Portrait (SP)	90	1,280	438
	Other-Portrait (OP)	85	1,240	416
	Narrative History (NA)	78	1,261	544
	Instructions (INS)	71	1,046	667
	Information (INF)	79	1,266	537
	Scenic (SC)	72	891	342
	Argument (AR)	77	1,329	462
Assessment	GRE	112	626	104
	TOEFL	111	446	86
Cross-disciplinary argumentative	MICUSP	186	2,735	1,907
Civic	*NYT*	920	742	223

4.3.2 Methodology for Comparing across Contexts.

4.3.2.1 Measuring difference between profiles. Our general methodology was to use the instructional data to estimate a rhetorical profile for each of the seven genres represented in these data. Next, we estimated rhetorical profiles for the USF first-year writing data, the assessment data, the argument across disciplines data, and the *NYT* data. Finally, we compared all profiles to the reference profile, namely, the profile of the argument genre in the instructional data. We used two methods of computing distance between profiles—a distance-between-distributions method from information theory (Kullback & Leibler, 1951) and a standardized-difference method originating in stylometrics (Burrows, 2002; Hoover, 2004a). The use of two methods was motivated by our wish to ascertain that the findings are robust across two methods of distance measurement that make somewhat different assumptions regarding the relative importance of differences across the rhetorical dimensions. Additional details about the methodology can be found in Beigman Klebanov et al. (forthcoming).

4.3.2.2 Measuring distance between distributions. The 16 rhetorical categories and the unmatched category cover 100% of an essay, where every character in every string is assigned to a single category. Therefore, it is possible to conceptualize this setting as a distribution of categories in a text, where the average proportion is an estimate of the probability of occurrence of the given category in a text of the given genre.

To compare two distributions, we used the information-theoretic notion of Kullback-Leibler divergence (Kullback & Leibler, 1951). The Kullback-Leibler divergence between probability distributions P and Q, denoted $D_{\mathrm{KL}}(P\|Q)$, is a measure of the information lost, measured in bits, when Q is used to approximate the true distribution P. $D_{\mathrm{KL}}(P\|Q)$ is defined as follows:

$$D_{KL}(P||Q) = \sum_{i=1\ldots17} P(i) \times log_2 \frac{P(i)}{Q(i)}$$

where the index i ranges over all possible values of the random variable. In our case, i ranges over the 16 rhetorical categories plus the unmatched category; estimates for the values of $P(i)$ for various categories according to distributions correspond to various archives. This method takes the ratio of the observed frequencies in two corpora (estimates of P(i) and Q(i)) and scales it such that large differences in categories that are more salient for the target profile P (that is, have a higher probability in the target profile P) are given more weight. The intuition is that what occurs more often in the target profile matters more.

4.3.2.3 Measuring standardized difference. The second method is adapted from stylometrics and authorship attribution literature, where a Delta family of measures (Burrows 2002; Hoover, 2004a, 2004b) is used to narrow down the set of possible authors of a new text by comparing the frequencies of commonly occurring function words in the new text to those in texts of known authors. Beck and Jeffrey (2007) adapted it to measuring distances between genres using frequent grammatical categories, such as verb tenses and aspects and sizes of nominal groups.

The method relies on a subtractive difference between proportions, and scales it relative to the variance *s* of the given category in reference data. Using the notation as before,[8]

$$StDiff(Q,P) = \sum_{i=1\ldots16} \frac{|P(i) - Q(i)|}{s_i}$$

Thus, a large difference in a category that is very stable across texts of the target genre would contribute much to the distance from that genre, while the same magnitude of difference for a category that has a larger variance in the reference genre texts would contribute less towards the overall distance. The intuition is that what is more out of the ordinary with respect to the target profile matters more.

4.3.2.4 Interpreting the magnitude of difference. To address the problem of scale (namely, how to tell whether the observed difference is large or small), we used the non-argument essays in the instructional data. Any difference between argument and other essays in the instructional data is due to the specific assignment, namely, the genre of the essay, since it is largely the same group of people who are writing all of the essays in the instructional data set. Thus, rhetorical differences that could be due to demographic factors, factors related to writing proficiency, or writer-specific stylistic preferences are controlled by design: if there is a difference *D* between the rhetorical profiles of argument and self-portrait essays in the instructional data, we take *D* as a quantification of difference between the two genres, argument and self-portrait, in graduate-level proficient writing in English.

Our quest is thus not only after a number, *x*, that quantifies the difference between the rhetorical profile of the first-year writing data and the argument instructional essays, but also an assessment of the relative magnitude of *x* against differences between argument and other genres as estimated from the instructional data. Thus, in order to support the claim that the first-year writing data is similar in genre to the argument instructional writing, *x* not only needs to be small, it needs to be smaller than, say, *D*, that is, the difference between argument and self-portrait genres.

Furthermore, we used the *NYT* data, the argument across disciplines writing data (MICUSP), and the assessment data to help estimate the extent to which the rhetorical profiles can vary between collections of texts that broadly share the genre of writing but are nonetheless different in other aspects. While the argument instructional essays, the argument across disciplines writing, the assessment essays, and the *NYT* editorials and OpEds are written in the support-an-opinion-on-an-issue genre, the topics, demographics, style, age, education, and other aspects that could impact word selection are different. The distance between argument instructional data and MICUSP/*NYT*/GRE/TOEFL data should thus help us estimate the variation in rhetorical profiles within the same genre and allow scaling the observed difference between target and reference writing with respect to within-genre variation.

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[8] Note that since the assumption of a probability distribution is not needed for calculation of standardized difference, we did not use the unmatched category, but only the 16 other Docuscope categories.

4.4 Step Three: Diagnose Differences from Comparing across Contexts

If comparing argument writing across contexts reveals some significant area of difference, our third step then provides a diagnostic step for writing programs to determine where the sources of difference are so that they can be responded to appropriately. Though there are many ways in which a writing program could analyze difference, here we create a reference corpus of argument writings from multiple sources to determine what rhetorical dimensions are contributing to the difference. Specifically, in order to analyze the target USF 1101 data, we randomly sampled 77[9] essays from each of instructional argument, MICUSP, GRE, TOEFL, *NYT*, and USF 1102, to create a reference corpus (ARGREF) of 462 argumentative essays produced across different contexts of writing. The question we ask now is: On which rhetorical categories, out of the 16 categories that constitute the rhetorical profile of an essay, does our target data stand out as being significantly lower or higher than the ARGREF corpus? For every rhetorical category, we performed the Mann-Whitney test,[10] comparing the distribution of the relevant category in essays in ARGREF archive versus those in the 1101 archive. We set the target significance level at $p<0.01$ and applied the Bonferroni correction to compensate for multiple comparisons. These results show sources of difference that the program can then analyze, and can optionally return to step one's results to determine how to edit their course if needed. While we do not necessarily demonstrate this analysis and editing process that a program might undergo fully in this paper, we do suggest ways in which our results may be useful for this process.

5.0 Results

5.1 Step One: Determine Course Sequence

In this section, we analyze student writing from each of the three assignments in both first-year writing courses. Through this analysis, we are able to determine specific types of discourse patterns (here, "rhetorical strategies") that reveal task requirements as evidenced by successful writing that students actually produce in response to the assignments. Through this analysis, we show how the task requirements build into a course sequence of skills that students learn to demonstrate.

5.1.1 ENC 1101. In order to identify sets of rhetorical strategies operating in each of the three assignments, we performed the following two-step analysis. First, we applied principal component analysis (PCA) of the correlation matrix to identify groupings of rhetorical categories that underlie the main dimensions of variation in the data. Second, for each of the top principal components, we checked whether it differentiated between essays belonging to the different assignments, using an ANOVA for each component. This procedure would allow us to set up a

[9] Since the smallest subcorpus—instructional argument—contains 77 essays, we fixed that as the number of essays per subcorpus, in order to avoid a dominant effect of any one of the subcorpora of ARGREF.

[10] We picked one of the rhetorical categories and used the Anderson-Darling test to check whether the essays in the ARGREF corpus exhibit a normal distribution for that category. The hypothesis of normal distribution was rejected with $p<0.01$. We therefore picked a non-parametric test for comparisons between ARGREF and 1101 archives.

correspondence between a bundle of rhetorical strategies (for example, those having strong positive loadings along the first principal component) on the one hand and an assignment on the other (the assignment whose essays tend to have a high score on the first principal component).

For the assignments in 1101, we applied PCA to the Docuscope-tagged texts. We retained the top four principal components that together accounted for 46% of the variance[11] across the 1101 corpus (although the eigenvalues were >1 for those and also some subsequent components, we decided to stop after the first four for reasons of interpretability). The ANOVA analysis revealed that each of the components was productive in accounting for some differences in rhetorical strategies across 1101 assignments at the .05 level or below. For each component, positive and negative loadings represent variables associated with the positive and negative poles of the component, respectively. As is standard with Docuscope measures, we interpreted each component pole as a discrete rhetorical strategy used by writers of the different assignments.

Table 3 presents each positive and negative factor (or component)[12] pole (rhetorical strategy) identified, the variables associated with this strategy (in order of decreasing importance), and the assignment from 1101 which exhibited the use of this strategy most strongly. Though each strategy typically has several variables associated with it, some variables emerge as more or less significant to understanding the strategy as a whole.

Table 3

Factor Pole Descriptions for 1101

Factor (pole)	Variable combinations/Rhetorical strategies	Assignment most identified with strategy
F1 (+)	Personal register, Assertive, Emotion, Character, Reasoning, Directives	Argument essay
F1 (-)	Academic register	Annotated bibliography
F2 (+)	Narrative, Past, Reporting, Elaboration	Trace a scholarly conversation over time essay
F2 (-)	Academic register, Future, Public register	Argument essay
F3 (+)	Interactive, Personal register, Academic register	Annotated bibliography
F3 (-)	Description, Personal relations,	Argument essay

[11] By "variance" here, we are referring to the variation discovered through the rhetorical profiles produced by Docuscope. Because each text in the corpus receives its own Docuscope-generated rhetorical profile, there is a certain amount of variation in the entire corpus across categories that can be accounted for through principal component analysis.

[12] In what follows, we use the terms "factor" and "component" interchangeably. While "component" is the standard technical term for the dimensions identified by PCA, it is also a fairly standard, albeit sometimes criticized, practice (Widaman, 2007) to think about PCA as a technique for extracting factors as a first step of the exploratory factor analysis, and the term "factors" is in common usage for designating the extracted entities.

Factor (pole)	Variable combinations/Rhetorical strategies	Assignment most identified with strategy
	Emotion, Assertive	
F4 (+)	Elaboration, Future, Character	Annotated bibliography
F4 (-)	Public register	Trace a scholarly conversation over time essay

Note. Variables listed in column 2 are those with the highest absolute loadings on the relevant factor, shown in descending order. All listed variables have loadings above |0.3|. Column 3 summarizes the results of ANOVA for the factor, showing the two assignments that are the furthest apart on the relevant factor.

From these eight factor poles, we identified four strategies that are most useful for understanding the assignments in 1101. These strategies are as follows, with our informal label for the strategy presented in italics.

> **Strategy one** (Factor one/Positive Pole). [*Reasoning Through Personal Viewpoints*]. The author uses voiced/propositional language to assert different personal viewpoints, and then reasons through these viewpoints to a conclusion.
>
> **Strategy two** (Factor one/Negative Pole). [*Academic Reference*]. The author uses high amounts of academic language, reflective of the language of abstraction, academic specialization, and citation.
>
> **Strategy three** (Factor two/Positive Pole). [*Academic Story-Telling*]. The author uses narrative and past-oriented language to create the temporal element of a story about an academic conversation, and reporting language to give details about the actions in that story.
>
> **Strategy four** (Factor four/Positive Pole) [*Character-Text Connection*]. The author writes in a complex syntax (coordinators, subordinators, prepositional phrases) that is populated by humans (personal pronouns, person types, person traits).

In the remainder of this section, we use the factor poles as depicted above to describe the types of discursive patterns that are most prevalent in each assignment and how this relates to the task requirements and sequencing of the assignments.

5.1.1.1 Assignment one: Annotated bibliography. Assignment one is an annotated bibliography, in which students describe six academic articles that relate to their chosen topic. Largely, the papers begin with a paragraph briefly introducing the paper topic. Then, the students describe academic articles that relate to their topic, focusing on describing the author and the main points of their arguments. Through interpreting the rhetorical strategies, we found this assignment to have two key task requirements: First, annotated bibliographies ask students to explicitly discuss the features of academic writing as a genre that we explain below. Second, annotated bibliographies ask students to discuss academic sources in terms of the characters (here, authors) who created them.

The first task requirement, discussing the features of academic writing, refers to students explicitly discussing a text's argument, background, topic, readers, and so on. The annotated bibliography assignment asks students to focus on explaining the actions of previous authors as social agents and contributors to their field. Students working on this assignment rely disproportionately on the "Academic Reference" rhetorical strategy (Factor one/Negative). Linguistically, this strategy is marked by high amounts of academic language, or language that points to abstraction, academic specialization, and citation. For this strategy, words like "topic," "background," and "the readers," to name a few, occur frequently as academic language that points to the rhetorical actions of previous sources. In the two examples below, drawn from student samples of annotated bibliographies, the academic language is italicized:

> "He [the author] provided a *solid background* about his *topic*, and, with his experience in social *networking*, he provided *information* that shows how social *networking* increased the *political* participation of the Tunisians in the last few years."
>
> "In addition, it makes my *argument* about *environmental* sustainability more complicated, and that can make it difficult for *the readers* to understand how they can establish an eco-friendly *business* without harming the natural world. *The writers* of this book, Gabriel Eweje who is a Professor of *Business* and Sustainability at the Massey *Business School*, and Martin Perry who is a Professor of *Economics* at the University of Illinois."

The "solid background about his topic," "information," "the readers," and so on are examples of abstract, academically specialized language that reference the rhetorical features of sources. This finding also complements Aull's study of this corpus (2017), which found that annotated bibliographies contained comparatively higher amounts of references to articles, sources, studies, and research in noun phrases. Together, then, our findings suggest that one task requirement of the annotated bibliographies is to explain the rhetorical features of academic texts.

The second task requirement that defines annotated bibliographies is the development of authors as central characters. When students step back from the sources to explain them on a rhetorical level, they also create characters who perform the actions of writing, giving information, providing a background, and so on. The authors become the key characters that drive the explanation of sources. In addition to recognizing and creating these characters, students also develop the ethos of these characters. Student samples show that the students not only refer explicitly to the authors as performing rhetorical actions, but they also frequently discuss the authors' credentials.

We derive this second task requirement from students' use of the "Character-Text Connection" (Factor four/Positive) rhetorical strategy. Discursively, this strategy is marked by high amounts of character and elaboration language. Character language refers to personal pronouns, person types, person traits, and names, and in annotated bibliographies, connects most frequently to authors and their credentials. Elaboration language refers to a more complex syntax, marked by coordinators, subordinators, and prepositional phrases. This language is indicative of a connection between different parts of a sentence, which in this case, is between characters (authors), texts, and the actions that they perform on their texts. In the two examples below (the same examples from above), character language is italicized and elaboration is bolded:

> "*He* [the author] provided a solid background **about** *his* topic, **and**, **with** *his* experience **in** social networking, *he* provided information **that** shows how social networking increased the political participation of the *Tunisians* in the last few years."

> "**In addition**, it makes my argument **about** environmental sustainability **more** complicated, **and that** can make it difficult **for** the readers to understand *how* they can establish **an** eco-friendly business **without** harming **the** natural world. The writers **of this** book, *Gabriel* Eweje who is a *Professor* of Business **and** Sustainability at the *Massey* Business School, **and** Martin Perry who is a *Professor* **of** Economics at the University of Illinois."

In terms of character, in the first example we see "he" performing the actions of providing background and information. We also see moves to establish the authors' ethos, referencing "his experience" in the first example, and the professor positions of the authors in the second example. The elaboration in terms of connecting author and text is most apparent in the first example, where the author's actions (providing background and information) are connected to the text ("about his topic" and "that shows how social networking…"). The elaboration in the second example is also notable for developing cross-textual complexity: the student here is connecting "it" [the author's argument] to their own argument, and then connecting that to readers and their responses. The syntactic complexity represented by these elaboration words signals a complexity in the connection between author and text, whether the author's own or the students'. The "Character-Text Connection" strategy builds off of the "Academic Reference" strategy: "Academic Reference" asks students to discuss sources on a rhetorical level, and the "Character-Text Connection" strategy adds participants to that conversation and allows connections between those participants and the students who are writing. Separately, though, these rhetorical strategies reveal to us that as an assignment, annotated bibliographies ask students to explain sources rhetorically and to progress through sources through the sequential analysis of characters.

5.1.1.2 Assignment two: Trace a scholarly conversation over time essay. Assignment two asks the students to trace a scholarly conversation over time. In this assignment, the students incorporate several sources to create a narrative of a conversation that they are interested in. This assignment functions similarly to a literature review, wherein students synthesize multiple sources into one cohesive scholarly conversation to understand the development of an idea over time. We found that the key task requirement in this assignment is story-telling. That is, rather than providing a listing of several sources and their main ideas, students are asked to craft a temporally-oriented story out of the sources and the way they progressed over time.

In terms of assignment sequence in 1101, this assignment builds off of the annotated bibliography as its foundation. The annotated bibliography asked students to see sources rhetorically, and thus as pieces of a conversation, and the authors as characters who were speaking in that conversation. This second assignment asks students to add a temporal element to this conversation and to see the conversation not in terms of isolated sources, but as building on itself. While the annotated bibliography keeps sources separate, this second assignment requires students to craft these sources into one cohesive story.

We derived this task requirement from students' use of the "Academic Story-Telling" (Factor two/Positive) rhetorical strategy. This strategy has two key features: First, it involves the use of temporal language to develop a sequence of the sources. Discursively, this is evidenced through words relating to dates, biographical events, shifts in time, duration, past tense, and narrative (-ed) verbs. Second, this strategy involves reporting actions that characters performed. Students report that different authors test, analyze, look at, and so on, to develop the key analytic and research-based actions that drive a temporal scholarly conversation. In the example below from a sample student assignment, narrative and past language (temporal language) is italicized, and reporting language is bolded:

> "*Since the beginning of the century*, the **analysis** of the economic **transition** in China and **Russia** former socialist countries *remained* fairly the same. However, since *2011*, **the** new knowledge **gained** and **the** evolution of these two countries in the short run established a **modification** in the countries [*sic*] economic hypothesis concerning the *long run.*"

Temporal elements are signaled through numerical dates and phrases like "Since the beginning of the century," which show students placing their sources in sequence and articulating how they build on each other. The reporting verbs point to the specific research developments that correspond to these temporal elements. The students here point out that sources "remained fairly the same," showed some "analysis of the economic transition," and "established a modification." This type of language asks students to identify the main contribution of a source and how it fits into the contributions of other sources in the conversation. These two patterns together suggest that the key task requirement of this assignment is for students to craft a story about the progression of an academic conversation over time.

5.1.1.3 Assignment three: Argument essay. Assignment three is an argument essay, in which students build on other sources to argue their position on a controversial issue. The issues range widely, from the causes of eating disorders, to the value of Title IX, to the benefits of bilingual education, to name a few. In this assignment, students use a variety of both academic and popular sources to back up their positions, as well as regularly use sources to insert a counter opinion which they refute. We found this assignment to have two task requirements: First, this assignment asks students to present different voices (including their own) to build a controversy and reach a conclusion. Second, the assignment asks students to engage in reasoning about their topic, using these different sources.

This argument assignment continues building off of the sequence of the previous two assignments in terms of skill progression. Previously, students have demonstrated an ability to see sources as part of a temporal conversation that builds on itself over time. In this final assignment, students become the next voice in this conversation by asserting the voices of past participants to reason through to a conclusion. While this argument assignment is not meant to be a conclusion to the conversation in its entirety (many students suggest the possibility of future research at the end), it is an opportunity for students to see a conversation and assert their own reasoned conclusion into it.

We derived these two separate task requirements from students' use of the "Reasoning Through Personal Viewpoints" rhetorical strategy (Factor one/Positive). This strategy is complex with three key features: First, students assert various viewpoints (including their own) with auxiliary verbs such as "it is," "there is," "it must be," and so on. This type of language stresses the existence of what follows, which in this case are different perspectives and evidence. Second, the students use relatively high amounts of the personal register, including words that signal belief ("think"), disclosure ("admit"), confidence ("certainly"), and self-disclosure ("I confess"). These personal register words typically follow assertions, so that the students are asserting the existence of a voice and then explaining what they believe. Finally, through this cacophony of voices, the students reason through to a conclusion. Reasoning language points to words like "therefore," "if…then," "or "deny," for example. These words signal that the students are using the multiple voices they describe to reach some conclusion out of them. The two examples below show all three of these features in use:

> "However, there is a group of scholars who believe that a parent should not be forced to take responsibility of a child that they refuse to care for."
>
> "Therefore, future researches [*sic*] need to have reliable and valid studies for the effects of music therapy on specific psychiatric disorders before it gets used ubiquitously."

Assertive language occurs in "there is," "should not," and "need to have." In these cases, the students are asserting the existence of these different viewpoints (in the first example, the "group of scholars," and in the second, their own). The personal register is most evident in the first example with "believe," where the student is explaining what this asserted voice is saying. Finally, both of these examples start with reasoning words ("However" and "Therefore"). The "however" signals that this group's beliefs are likely in conflict with something just previously said, thus placing the authors in conversation. The "therefore" represents the student reaching a conclusion of their own, culminating their final argument. Similar to students reasoning through to their final claim, Aull (2017) found this corpus to have comparatively high amounts of causative language ("because," for example). She explains that this language points to persuasion, rather than information giving, which distinguishes it from the previous two assignments (Biber et al., 2002). The “Reasoning Through Personal Viewpoints” strategy allows us to see that this assignment ultimately asks students to present voices as part of a controversy, and then reason through to some final conclusion.

Having analyzed each assignment for its distinctive discursive patterns (in the form of rhetorical strategies), and seen how those patterns reveal underlying task requirements, we are now in a position to describe the task requirements revealed. Table 4 summarizes the rhetorical strategies and derived task requirements from the 1101 assignment sequence.

Table 4

Rhetorical Strategies and Task Requirements from 1101 Sequence

Rhetorical strategy	Task requirement (assignment)
Academic Reference	Discuss features of academic writing (Annotated bibliography)
Character-Text Connection	Create characters in academic writing (Annotated bibliography)
Academic Story-Telling	Craft a temporal story (Trace a scholarly conversation over time essay)
Reasoning Through Personal Viewpoints	Present different voices (Argument essay)
	Reason to a conclusion (Argument essay)

With the task requirements in sequence, we can see that each assignment asks students to perform new tasks and also builds on the last. First, students are asked to discuss academic writing and the people in it, then present that academic writing as part of a story, and finally create a reasoned argument based on how that story has progressed. These requirements are realized through the specific rhetorical strategies and discursive patterns exemplified in the samples above.

We may also think about these rhetorical strategies in broader pedagogical terms though, considering how the language and tasks as realized through the rhetorical strategies relate to writing skills and domains. In terms of writing skills, the rhetorical strategies described here suggest that students demonstrate skills relating to interpreting and analyzing academic sources, integrating sources into a cohesive narrative for their own purposes, and joining larger conversations by situating themselves within it. For example, when students demonstrate the “Academic Reference” and “Character-Text Connection” rhetorical strategies, they are interpreting and analyzing academic sources through rhetorical descriptions of texts, discussions of authorship, and relating texts together around similar topics. Thinking back to the cognitive domain of writing constructs, we can see how the rhetorical strategies in 1101 point to students needing certain knowledge about the tasks at hand, about information literacy to interpret sources, or about what an academic audience expects in terms of crafting temporal stories in literature reviews. In terms of interpersonal and intrapersonal domains, we can also begin to imagine that engaging with other authors' arguments might require openness to new ideas and a conscientiousness about how those authors are represented. We are connecting to these domains here primarily on a hypothetical level, as we do not know the 1101 instructor's exact intentions or how these domains may have been more fully realized in the students' writing processes. However, we do believe that these connections can allow us to think more critically about our writing tasks by asking if our analysis matches how we wish to develop domains in our classes, and to then consider what other kinds of language we need to foster in assignments in order to better meet those wishes. This is a point we return to somewhat in the later steps of our method.

5.1.2 ENC 1102. We applied the same method to 1102 assignments, tagging the texts with Docuscope and then extracting principal components. We retained three components (factors) that together accounted for 37% of the variance across the 1102 corpus. Each of the components has an eigenvalue above 1.5. The ANOVA analyses show that each component was productive in accounting for some differences in rhetorical strategies across 1102 assignments at the .05 level or below.

Table 5 presents each positive and negative factor pole (rhetorical strategy) identified, the variables associated with this strategy (in order of decreasing importance), and the assignment(s) from 1102 which exhibited the use of this strategy most strongly. Though each strategy typically has several variables associated with it, some variables emerge as more or less significant to understanding the strategy as a whole.

Table 5

Factor Pole Descriptions for 1102 Assignments

Factor (pole)	Variable combinations/Rhetorical strategies	Assignment(s) most identified with strategy
F1 (+)	Personal relations, Assertive, Emotion, Reasoning, Public register, Character, Narrative	Propose a solution to an argument essay, Argument essay
F1 (-)	Academic register, Description, Reporting	Analysis of visual rhetoric,
F2 (+)	Public register, Academic register, Elaboration	Propose a solution to an argument essay
F2 (-)	Interactive, Personal register, Description, Reporting, Reasoning	Argument essay
F3 (+)	Narrative, Past	Argument essay
F3 (-)	Personal register, Elaboration	Analysis of visual rhetoric

Note. Variables listed in column 2 are those with the highest absolute loadings on the relevant factor, shown in descending order. All listed variables have loadings above |0.3|. Column 3 summarizes the results of ANOVA for each factor, showing the two assignments that are the furthest apart on the relevant factor.

From these six factor poles, we identified four strategies that are useful for understanding the assignments in 1102. These strategies are as follows, with our informal label for the strategy presented in italics.

Strategy one (Factor one/Positive Pole). [*Reasoning Through Asserted Viewpoints*]. The author uses character language to create actors, whose voices are asserted into the writing. These voices are connected through personal relations language, and the author uses reasoning language to come to a conclusion about the varying voices' asserted views.

Strategy two (Factor one/Negative Pole). [*Visual Reporting*]. The author uses high amounts of description language to describe a visual scene and reporting language to explain what these visuals accomplish.

Strategy three (Factor two/Negative Pole). [*Reader Interaction*]. The author uses the personal register and interactive language to engage with and convince the reader of their argument.

Strategy four (Factor three/Negative Pole) [*Visual Effect*]. The author uses the personal register to explain how a viewer understands a visual.

In the remainder of this section, we use the factor poles as depicted above to describe the types of discursive patterns that are most prevalent in each assignment and how this relates to the task requirements and sequencing of the assignments.

5.1.2 .1 Assignment one: Analysis of visual rhetoric. Assignment one asks students to analyze visual rhetoric. In this assignment, students choose two visual artifacts (such as an advertisement, magazine cover, campaign poster, etc.) and explain how the visual choices affect the reader and relay a message. The analyses are specific in their descriptions of visual features and focus on explaining how these features are tied to audience, context, and the rhetorical situation broadly. We found this assignment to have two key task requirements: First, the assignment asks students to describe the visual in detail and also explain the purpose of these visual features. Second, students must then explain how these visual choices rhetorically impact the viewer.

The first task requirement, describing and explaining the visuals, refers to students creating a textual representation of visual elements through naming specific colors, shapes, objects, and so on. Then, the student explains what these elements "do," or the effect that they have in the visual as a whole. Students writing this assignment rely disproportionately on the "Visual Reporting" rhetorical strategy (Factor one/Negative). Linguistically, this strategy is marked by high amounts of description and reporting language. Description language refers to language that appeals to the five senses and concrete experiences, which in this assignment often refers to specific colors or physical objects in the visual. To explain what these described elements do in the visual, students use reporting language. This refers to language that reports states ("being"), change ("transform," "increase"), or events ("created"), to name a few. In this assignment, a certain color may "give," "be," or "transform" something in the image, for example. This strategy also complements Aull's (2017) findings, which found a high use of reporting verbs paired with descriptions in this assignment.

The second task requirement, explaining how visual choices impact the viewer, builds on the first. In this requirement, students move beyond describing an image to explaining its rhetorical effect. To do so, the student must imagine a viewer and represent their presence and reactions in the text. Linguistically, this is accomplished with the "Visual Effect" strategy (Factor three/Negative), which includes high amounts of the personal register. Most notably, this language refers to words that signal cognition, such as a person viewing, thinking, believing, and so on. In this case, these words signal how a viewer is perceiving the described visual. The two examples below, drawn from student papers, exemplify both of these strategies:

> "These colors give a sense of warmth to the image, given that they are not bright enough colors to make the audience want to look away or change the image, but it makes them highlighted over the dark blue and black background that it displays"

> "In Image B the ad makes great use of the color pink, the background is pink as well as the bra and lipstick. Generally the colors red and pink are viewed as being romantic and sexual. Specifically, the color pink signifies romance, love, and friendship"

The description language here includes "colors," "image," "dark blue, "black," "displays," "pink," "bra," "lipstick," and "red." These words are depicting in language the visual features of the image and ad that the students are analyzing. With these descriptions, the students also report on what these features do, using words like "give," "change," "makes," and "signifies." These reporting words connect the visual description to its action, often by making the visual description the actor: "colors give" and "pink signifies." Finally, in moving towards rhetorical effect, the personal register connects these reports to the audience. The most notable example of the personal register is in the second example, where the student explains that "red and pink are *viewed*" in a certain way. The "viewed" points to the effect that these colors have on the audience. Together, these two strategies show the students completing the tasks of describing a visual, reporting what it does, and explaining the rhetorical effect of the visual on an audience.

5.1.2.2 Assignment two: Propose a solution to an argument essay. Assignment two asks students to identify two conflicting sides of an argument and find a compromised solution. For example, one student saw a conflict between the American Heart Association and McDonald's and suggested that McDonald's should sell healthier food. In this assignment, the students spend a significant amount of the essay in explaining each side before finally suggesting some compromise that would address both sides' major concerns. We found this assignment to have three key task requirements: First, students must be able to create characters (sides of the argument) who have relationships with each other. Second, students must be able to assert the voices of these characters. Finally, students must be able to consider both sides to reason through to a compromise.

The first task requirement, creating characters with relationships, refers to students developing each side of the argument. To do this, students must name specific companies, organizations, stakeholders, or other actors that are involved in the conflict, as well as articulate the relationships between them. This creates a set of interrelated characters, which here corresponds to different sides of the argument. The second task requirement is closely related and shows students asserting the voices of these characters to create the viewpoints in the argument. To accomplish these tasks, students rely on the "Reasoning Through Asserted Viewpoints" (Factor one/Positive) strategy. This strategy is characterized discursively by several types of language, including in part, character, personal relations, and assertive. Character language refers to naming specific people and audiences, and personal relations demonstrates types of relationships between actors. Finally, assertive language refers to words that show stress and emphasis, which characterize the strongly held viewpoints of the characters. The example below shows these three types of language:

> "By truly compromising in this way both stakeholders would become stronger and better organizations and more effective in reaching their common goals"

Character is marked by "stakeholders" and "their," and represents sides of the argument. The personal relations in this passage are best exemplified by "common," which signals a relationship through compromise. Finally, assertive language is best marked by "truly," which adds stress to the statement. In doing so, they signal that the voice(s) behind that statement is more fully present in the text, rather than being described neutrally or from afar. This has the effect of developing each character, as well as giving more credence to their respective viewpoints.

The third task requirement, considering both sides to reason to a conclusion, refers to students using their own sense of logic to resolve the argument they represented. Now that students have created characters and represented their respective viewpoints, students are tasked with presenting and justifying their own conclusion. This task requirement is accomplished with the final feature of the "Reasoning Through Asserted Viewpoints" strategy, which includes high amounts of reasoning language. Reasoning language refers to that which directs the audience between statements through inference, and it is most present near the end of papers when students are justifying their decision. In the example below, reasoning language is italicized:

> "On the basis that both groups want to save lives, this should be an acceptable compromise that favors *neither* full vaccination *nor* the abolition of vaccination; rather its focus is on saving the most lives *possible* by intertwining the beliefs of both groups"

In this example, the student is using reasoning language to explain how it satisfies the conditions of both sides (with "neither" and "nor"), as well as giving the best "possible" outcome from their solution. By doing so, the student creates a reasoned explanation for their solution. As a whole, then, this strategy allows us to see that this assignment asks students to create related characters, assert each character's viewpoints, and present a reasoned solution for those characters.

5.1.2.3 Assignment three: Argument essay. Assignment three is an argument essay, and is very similar to assignment three in 1101. In it, students build on other sources to argue their position on a controversial issue. This task is similar to assignment two, wherein students identified two competing viewpoints and suggested a compromise. The fundamental difference between these two assignments, though, lies in what the student is promoting. In assignment two, the student sees a controversy and promotes a solution. In this assignment, the student sees a controversy and enters that controversy: the student promotes their own stance on the controversy, rather than trying to mediate between two already existing sides. This final assignment shares the task requirements of assignment two but also has one additional requirement of convincing the readers of their own stance.

In terms of rhetorical strategies, students writing the argument essay also use the “Reasoning Through Asserted Viewpoints” strategy from proposing a solution to a problem. This argument paper shows high amounts of character and personal relations, assertive, and reasoning language to create sides of a debate. This strategy can be seen in an argumentative text in the example below:

> “Despite these benefits of assisted suicide, there is still a big misconception about physicians forcing their patients to choose death. According to Kevin Yuill, a senior lecturer at the University of Sunderland, who oppose assisted suicide point to the possibility of the state coercing individuals to (Yuill, 499)”

Here we see characters like “Kevin Yuill, a senior lecturer” who has the personal relation of “oppos[ing]” another viewpoint that is pro-assisted suicide. “Despite” at the beginning also points to personal relations, which is set up between the previous statement and the “big misconception” being introduced here. Assertive language can be seen in the explicit voice of Yuill. In this example, reasoning language is being used to represent the reasoning of this particular viewpoint, that is depicting patients that must “choose” between life and death. In this sense, the argument assignment is rhetorically similar to assignment two, in that characters are being related to each other, their voices asserted, and viewpoints are being reasoned about.

In this argument assignment, though, students are tasked with actually entering the conversation that they create. This means that the student does not only represent a conversation, but also takes a position in it. To argue for their position successfully, the students need to address the reader as an audience that needs to be swayed. Assignment two asked the students to find a compromise between two existing solutions, which meant the only viewpoints that needed to be considered in the compromise were the represented actors. In this third assignment, the reader’s viewpoints also need to be considered in order to argue successfully for the student’s position in the conversation. To accomplish this, students rely heavily on the “Reader Interaction” (Factor two/Negative) strategy. This strategy involves high amounts of interactive language and the personal register, indicating an explicit recognition of the readers and their personal states in the text. Interactive language most frequently refers to using second-person pronouns to directly address the audience, while the personal register addresses cognitive states such as thinking or believing. The two examples below show this strategy in use, where personal register and interactive language are both italicized:

> “*You* may *find yourself* questioning *exactly what it is that you* specifically *can do* to eliminate *this* massive issue. For the youth in *your* life, *you* can be an active voice *simply* by being a positive role model.”
>
> “Once *you* change *your perspective* on breastfeeding then you can take steps to adjust laws in place by contacting *your* local legislature.”

In these examples, the students are justifying their position by explaining how it can be implemented practically. This application is connected explicitly to the reader, in both cases invoking the use of second-person pronouns. By doing so, the students ask the reader to take on their position. This strategy signifies the fundamental difference between the second and third assignments, and also their connection sequentially, as it points to the existence of a new viewpoint which the audience is being asked to accept as their own.

Having analyzed each assignment for its distinctive discursive patterns (in the form of rhetorical strategies), and seen how those patterns reveal underlying task requirements, we are now in a position to describe the revealed task requirements. Table 6 summarizes the rhetorical strategies and derived task requirements from the 1102 assignment sequence.

Table 6

Rhetorical Strategies and Task Requirements from 1102 Sequence

Rhetorical strategy	Task requirement (Assignment)
Visual Reporting	Describe and explain visuals (Analysis of visual rhetoric)
Visual Effect	Explain how visual impacts viewer (Analysis of visual rhetoric)
Reasoning Through Asserted Viewpoints	Create related characters in an argument (Propose a solution to an argument essay, Argument essay)
	Assert voices of characters (Propose a solution to an argument essay, Argument essay)
	Reason to a compromise (Propose a solution to an argument essay, Argument essay)
Reader Interaction	Sway the audience (Argument essay)

With the task requirements in sequence, we can see that the “propose a solution to an argument” essay and the “argument” essay build clearly on each other. The “propose a solution to an argument” essay asks students to create a debate and see a solution, and the “argument” essay adds the task requirement of swaying the audience about the student’s position. The connection between the “analysis of visual rhetoric” and the latter two is less explicit in terms of task requirements. The “analysis of visual rhetoric” asks students to describe and explain rhetorical choices, which are tasks not clearly present or built upon in the final two assignments. Though the visual rhetoric analysis is not clearly connected in terms of sequentially building skills, it is important to note that the skills practiced in this analysis are likely independently important for students to gain proficiency in. In 1102 as a whole then, we see students demonstrating skills of interpreting new media, integrating sources into an argument, identifying and creating problem-solution patterns, and inserting their own voices into larger arguments. All of these skills may point to developing cognitive domains like audience knowledge (in knowing how to interpret visuals appropriately for groups) and problem solving knowledge (in proposing a solution to a debate), as well as interpersonal and intrapersonal domains like ethics or agreeableness (in devising an appropriate solution). By analyzing rhetorical strategies to derive task requirements in this way, we are able to begin reflecting critically upon how the tasks that we ask students to complete fit together into a sequence that students can follow and that instructors can clearly track progression through.

The local strategic analysis of 1101 and 1102 provides us with specific rhetorical strategies and a way to describe how task requirements build into a developmental sequence. In both courses, we analyzed the progression of assignments as they build up to a final “argument.” Our analyses of the two course’s argument assignments were based only on the assignments leading up to each, but we did not compare the two final assignments across courses. We found that when the two argument assignments are compared directly side by side (rather than only to other assignments in their course), they show some statistically significant difference. This difference appears to be connected to the assignment sequence which preceded each assignment.

Compared to each other, the argument assignment in 1101 shows an “academic source-focused” rhetorical strategy, while the argument assignment in 1102 shows a “stakeholder investment” rhetorical strategy. An “academic source-focused” strategy refers to students using more academic sources and conversations to back up their claims. On the other hand, a “stakeholder investment” strategy refers to students drawing in the voices or ideas of different actors who hold a stake in their debate, and using these to build up their argument. The key difference is in the types of sources, evidence, and viewpoints that are used. The two examples below, the first from 1101 and second from 1102, demonstrate this distinction:

> “On the contrary, many studies show that the development of an eating disorder is almost always effected [*sic*] by what is seen in the media.”

> “Many people do not realize that sex trafficking is actually happening directly around them and many cases in Florida involve minors who are being sold by their parents or guardians.”

The student in 1101 references “many studies” to make their claim, while the student in 1102 refers more generally to “many people.” The reference to “studies” is clearly academic, and evokes a larger academic conversation on their topic. “Many people” is broader, and is used to reference the public actors who may be impacted by the debate.

Recalling the assignment sequences of these two courses, we note that these two rhetorical strategies appear to emerge from their respective sequences. The argument assignment in 1101 was preceded by an annotated bibliography and an assignment which reviewed an academic conversation over time, both of which have a more academic and source-based nature. On the other hand, the argument assignment in 1102 was preceded by a visual analysis and an assignment which asked students to find a compromise in a public debate, the latter asking students to represent different sides of a public argument with public stakeholders. Given this sequencing, we might connect the “academic source-based” strategy to the academic focus of 1101’s assignments, while the “stakeholder investment” strategy may be connected to representing sides of a public debate in 1102.

Recognizing the differences in the two argument assignments, we may ask the following: By what criteria can we call both of these assignments “argument”? Step one of our method is useful to writing programs for describing how their assignments fit into a course sequence together. But writing programs should also be interested in understanding how their assignments compare to other institutions and contexts, so that they may determine if their students’ “argument” matches understandings of argument outside of the local context of their classroom.

In returning to our question, several factors may lead us to conclude that both of these assignments are indeed “argument”: they are both titled as such; Aull’s study (2017) grouped these two final assignments together and analyzed them as “argument;” our experience as human readers allows us to intuitively conclude that they are; they both share high amounts of “reasoning” language in their separate rhetorical strategies. But the local analysis is designed to show difference through comparison, not similarity. When we see differences among the argument assignments, it is beyond the scope of local strategic analysis to determine whether the differences reside within thresholds that permit us still to call them the same genre. Establishing these thresholds for intra- vs. inter-genre variation requires more absolute rather than comparative metrics for classifying texts and a more macro- (argument across institutional contexts) rather than micro- (argument within a single classroom sequence) scale for mapping textual corpora that purport to fall within the boundaries of one genre or another. The following sections discuss our efforts to construct such a metric.

5.2 Step Two: Compare Course Assignments to Outside Contexts

Following the methods described previously, we present two measures which both show the “distance” of various corpora from a base argument corpus. Figures 1 and 2 show the placement of the two first-year writing argument archives (shown in red) on the scale anchored by the instructional ARGUMENT archive. Figure 1 shows results using the D_{KL} measure, while Figure 2 shows results using the StDiff measure.

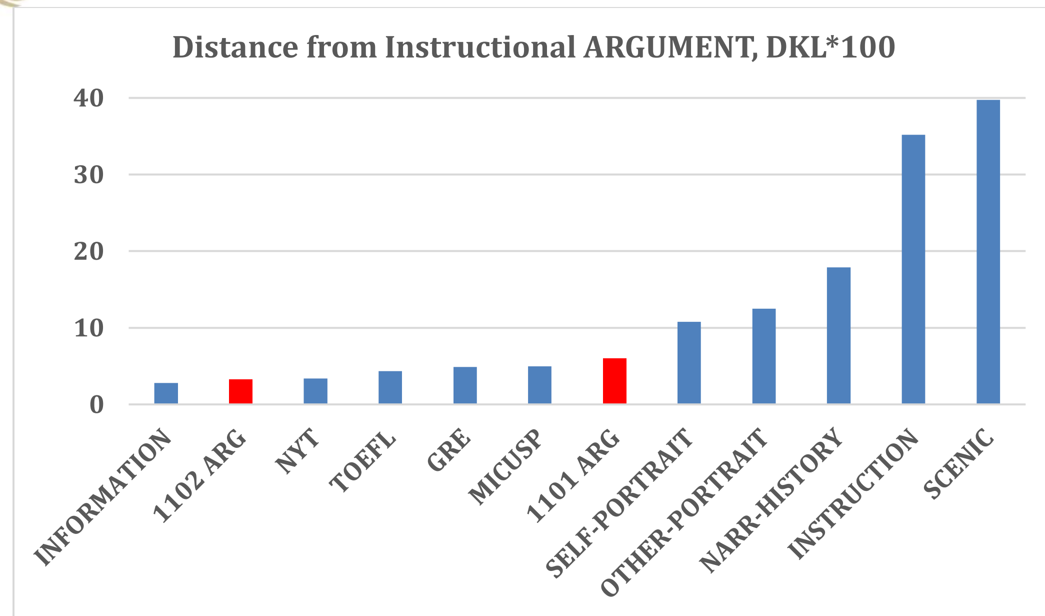

Figure 1. Using the DKL measure, this figure shows the distance of each corpus from the instructional ARGUMENT corpus. The 1101 and 1102 argument archives are marked in red for identification.

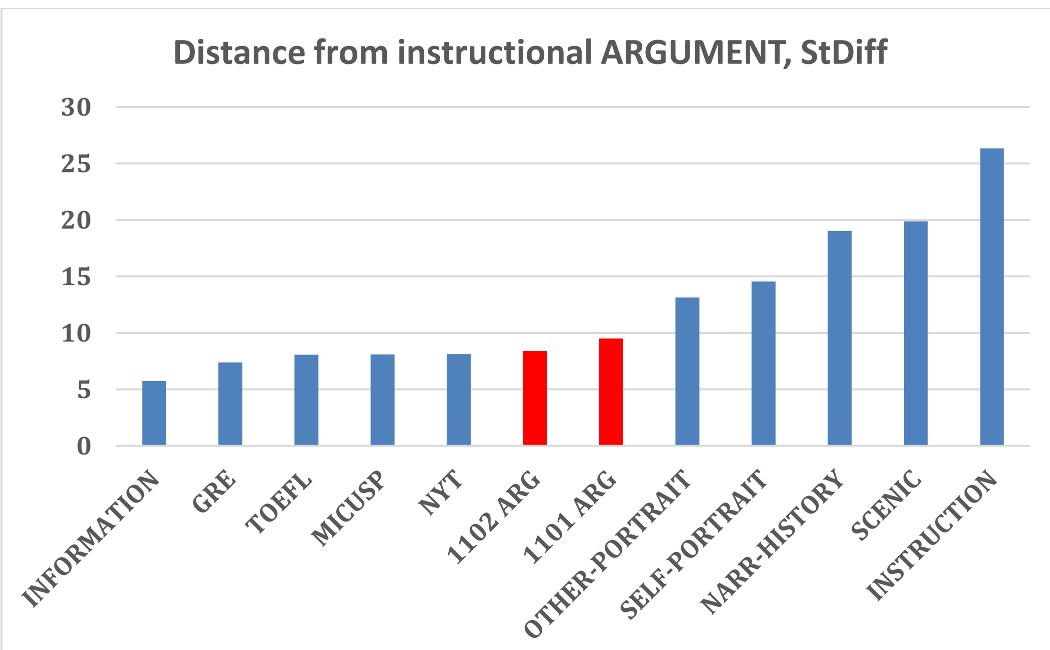

Figure 2. Using the StDiff measure, this figure shows the distance of each corpus from the instructional ARGUMENT corpus. The 1101 and 1102 argument archives are marked in red for identification.

From these data, we see that the placements of corpora are similar across both measures (Pearson's r=0.92, n=12). Looking at the distances in each chart, the instructional INFORMATION corpus is the closest to argument, followed by the 1101 and 1102 courses and other argument corpora (including GRE, TOEFL, *NYT*, and MICUSP data), and finally, the other genres from the instructional data are the furthest away. INFORMATION falls the closest in part because of the sequencing of the class in the instructional dataset: students were tasked with learning to present information to a public audience first, and then followed this with arguing to a public audience. Because arguing publicly requires a considerable amount of information to appeal to a general (rather than specific, private) audience, the two genres see significant overlap. We also see from these results that 1101 and 1102's argument corpora are overall quite similar to each other in terms of distance, indicating that the rhetorical practices used in each are similar (this matches our finding of similar rhetorical strategies in the local analysis); however, 1101 is consistently the furthest away from the instructional ARGUMENT archive among the argumentative archives examined here, which warrants some further investigation.

5.3 Step Three: Diagnose Differences from Comparing across Contexts

To further understand the rhetorical dimensions that underlie the placement of the 1101 archive relative to other archives containing argumentative writing, we now determine the sources of the difference revealed in step two. Table 7 shows the mean values for the 16 rhetorical categories in 1101 argument and in the ARGREF archives.

Table 7

Proportion of the Text (%) Belonging to the Given Rhetorical Category, on Average, for Archives 1101 Argument and ARGREF

Rhetorical category	1101 Argument	ARGREF
Personal	**4.5	6.5
Emotion	4.0	4.2
Assertive	**2.7	3.5
Description	5.4	7.4
Public	*11.8	10.2
Academic	**18.5	15.4
Future	1.7	1.9

Rhetorical category	1101 Argument	ARGREF
Past	1.0	1.1
Personal Relations	2.6	2.4
Reasoning	**3.5	4.8
Interactive	*1.1	1.8
Elaboration	11.7	11.7
Reporting	13.7	13.6
Directives	0.4	0.4
Narrative	2.7	2.8
Character	6.6	5.8

Note. Asterisks show categories that are significantly different between 1101 and ARGREF:
* $p<0.05$; ** $p<0.01$.

We found that 1101 essays are significantly different ($p<0.01$) from ARGREF on four dimensions. They make less use of the personal register (mean proportions of text belonging to the personal register are 4.5% vs. 6.5%, for 1101 and ARGREF, respectively), they are less assertive (2.7% vs. 3.5%), they are more academic (18.5% vs. 15.4%), and use less reasoning (3.5% vs. 4.8%). They are also marginally more public (11.8% vs. 10.2%, $p<0.05$) and less interactive (1.1% vs. 1.8%, $p<0.05$).

One way to explain these differences is by considering the different rhetorical situations of 1101 and other argumentative corpora. While more advanced argument writing (such as public argument writing in the *NYT* or data from the instructional course produced by professional M.A. students) is focused on convincing an audience in real and authentic situations, argument writing in 1101 is helping freshmen to become acculturated into academic writing as a genre. More advanced public-facing writers for the *NYT* or professional writing M.A. students in the instructional course ultimately focus on putting their own voices into their argument so that their arguments can appear personable and convincing to a public audience. In contrast, freshmen who are learning academic writing often need to learn to take their voices out of the argument and to focus on their research.

To this end, we see personal and assertive less in 1101 writing because these language features point to a higher presence of the author’s voice. In the following two textual examples, the first from the instructional ARGUMENT corpus and the second from 1101, we see that the more advanced writer uses assertive language (italicized) throughout the paper to justify their own personal argument (here, that prenatal yoga is not harmful), while the freshman writer uses assertive language only briefly in their paper to suggest what future research should do:

> "You have to make sure in all twisting poses that you are not putting *too much* pressure on your abdomen."
>
> "Physicians *need to* be properly informed of music therapy treatments and *must* begin to explain to patients the positive outcomes."

In this case, assertive language is being used by 1101 writers, but is limited to only a specific, small portion of the entire text that focuses on the future action of research. In addition, the argument essay from the instructional data focuses around the writer's personal experience in this yoga class, while the 1101 writer is again focusing on research rather than personal experience. In this sense, the use of less personal and assertive language in 1101 may be justified by the overall rhetorical and epistemic goals of the writing assignment.

The prevalence of academic language in the 1101 argument essays is also explained by the rhetorical situations, as well as the sequencing of assignments as revealed in the local analysis. Because 1101 writers are being first introduced to an academic context, they are learning to become more "academic" and may be over-using this language in an effort to become acculturated to academic writing. The students' conception of their audience may also influence their use of academic language (that is, we may postulate that the students are trying to write to a more academic audience, and thus writing with more academic language). Both of these explanations are tentative, though, and would require a fuller investigation into the course design to explain in a way that leads to concrete course revisions. Additionally, we see higher amounts of academic language in 1101 as a whole. The local analysis revealed that all three assignments in 1101 had an academic nature, while only the final two assignments in 1102 were traditional academic genres. The consistent focus on academic writing in 1101 may also have contributed to the prevalence of the academic language in the final argument assignment. Table 8, below, shows the increased usage of academic language across the argument corpora.

Table 8

Proportion of Text Falling Under the Academic Category, Across the Different Argument Archives Used in this Study

Dataset	Academic
NYT	13.2
Instructional argument	14.3
TOEFL	14.7
GRE	15.8
1102 argument	15.9
MICUSP	17.5
1101 argument	18.2

From this table, we see that 1101 and 1102 are more similar in academic language to other student writing, especially the GRE and MICUSP corpora. This suggests that while 1101 and 1102 are higher in academic language than more public-facing argumentative writing, this is perhaps to meet an epistemic goal of acculturating students to academic writing as a genre, as well as to match the sequence of the course.

6.0 Discussion

The three steps presented above provide a means for writing program administrators to describe and analyze the student writing produced in their writing programs. Step one demonstrated how assignments in each class built on each other to create a sequence. By evaluating the rhetorical strategies used in each assignment, we were able to determine what rhetorical skills students are practicing and how those might sequence together coherently in each course. In the case of the courses at USF, both 1101 and 1102 allow the students to build up academic writing skills from evaluating sources and a conversation in an academic field to contributing their own argument into that discourse. Moving into step two, we were able to determine how student output compares to that of other writing programs or comparable corpora in the same genre. Realizing that this step revealed some difference, we turned to step three to diagnose the sources of this difference. In the case of USF, 1101 in particular was different from comparable corpora in terms of academic, personal, assertive, and reasoning language. By looking back at the local analysis, as well as at example texts, we determined why differences might be occurring, which appears to a be a combination of both student skill level and their rhetorical situation as freshmen writers.

For writing program administrators performing these analyses on their own programs, recall that we intend these analyses to be primarily descriptive and diagnostic, rather than prescriptive or evaluative. We expect administrators might use these analyses in an iterative process, using the diagnosed areas of difference as a lens to evaluate their course sequence and the skills that successful students are demonstrating. For example, an administrator at USF would see through this analysis that their students are writing with higher amounts of academic language than most other genres of argumentative writing, and could ask themselves if this is something they desire (perhaps they are interested in acculturating students to academic writing, or perhaps they are critical of a heavily academic approach to first-year writing, as some are). If they took issue with this finding, they might return to the assignment prompt to see if it is suggestive of a very academic assignment, or investigate teaching practices that might lead students to believe this is the writing they should be producing. We cannot fully make recommendations on the USF corpus, as we do not have the insider knowledge necessary to evaluate our findings in light of the program's goals. However, we believe this method is a fruitful starting point for gaining a fuller understanding of the state of a writing program before useful recommendations for change and adaptation can be proposed. In this sense, this method provides tools for description and diagnosis that we believe can be useful in helping writing programs to ask students to perform tasks that build on each other cohesively and are useful in other contexts, as well as makes learning goals clearer in a larger move towards "transferable 21st century skills" (National Research Council, 2012).

7.0 Conclusions

In this project, we set out to answer two research questions: First, what is the trajectory of the skills targeted by the sequence of tasks in the two courses, as evidenced by the rhetorical strategies employed by the writers in successive assignments? Determining the course sequence revealed a trajectory that built towards entering an academic conversation and evidenced multiple rhetorical strategies that worked together to build up to that point. Second, focusing on the final argument assignments, how similar are they to argumentative writing in other contexts, in terms of rhetorical profiles? Comparing across contexts, we observed an overall similarity but also a few statistically significant differences in terms of language usage between the USF argument papers and other argumentative writing. Combining these analyses together, we sought to provide a cohesive method by which to analyze a writing program and compare students' use of rhetorical strategies in relation to other argumentative contexts. We believe this method to be useful not only to individual writing programs, but to assessment literature broadly.

We also recognize two key limitations of our study. First, though we believe our corpora set to be well-curated for the purpose of calibrating against argumentative writing, corpora used in the global analysis (especially those that made up the ARGREF corpus) could benefit from a wider sourcing of texts. Argumentative writing is a complex, far-reaching genre, and determining what sources to include as a reference corpus is a rhetorical choice that might vary by a program's particular goals. Second, the writing program analyzed here is not our own, nor are we writing consultants for the program. Because of this, our knowledge about the context and expectations of these particular assignments is limited. While our analysis is able to show the sequencing of rhetorical skills and calibrate these against other argument writings based on what are considered successful student papers, we do not know how well these skills and calibration match with the particular, stated goals of the program or nuances of the classes that we drew from. In addition, the rhetorical strategies we found here might be nuanced in different ways if done by an analyst who had closer knowledge of the program-specific goals and teaching practices. In order to fully evaluate the results of this method and suggest concrete program changes, we would need the insider knowledge of the particular rhetorical context of the writing program. While these limitations are important to consider when conducting an analysis on a different writing program, the overall method ultimately provides writing programs with a more complete view of their student outcomes, how those compare to other contexts, and a means by which to describe and diagnose differences.

8.0 Directions for Further Research

This work provides an iterative process that is a first step in description and diagnosis for further writing program assessment. Future work in this direction might be focused in two key areas: First, we anticipate learning how this process will feed back into pedagogy and improve assignment practice. In this project, we sought primarily to provide a process by which to determine sources of difference that might need to be addressed. However, determining practically how writing programs will move these results into pedagogy opens the door for further research in assignment design, instructor practice, and overall program goals. Ultimately, we believe that this movement to pedagogy must be uniquely contextualized to each individual writing program's needs and goals for their students. Additionally, this project looked only at A papers from the courses so as to analyze curriculum, not students. Further research might investigate how these types of analysis can be used for more individualized feedback and assessment of student writing.

Second, the results from this study suggest a method by which to study argument writing as a genre. We used this method to test specific textual instances against the genre of argument, and to see what dimensions made up that difference. Considering genre as "social action" (Miller, 1984), we believe methods like ours can help us identify how similar action is accomplished through linguistic resources: the similarities in rhetorical strategies across our argumentative data might allow us to consider what linguistic forms and patterns "do" the action of argument. Further research might explore this path and investigate how this type of analysis affects our understanding of genre, its boundaries, and definitions. Advancing our theoretical understanding of genre in hand with a corpus-based analytical method would provide us with important developments not only in rhetorical theory, but in genre-based pedagogy and continuing efforts to improve our writing program instruction.

Author Biographies

Hannah Ringler is a PhD student in Rhetoric at Carnegie Mellon University. Her research interests focus on the application of computational textual analysis methods in rhetoric, especially investigating their utility to writing studies, composition, and Writing in the Disciplines.

Beata Beigman Klebanov is a senior research scientist at Educational Testing Service R&D. Her research interests focus on using Natural Language Processing for automated evaluation of writing, including aspects such as effective argumentation, topicality, use of facts, sourcing, vocabulary choice, and use of figurative language. Together with T. Veale and E. Shutova, she has co-authored the book *Metaphor: A Computational Perspective* (Morgan and Claypool Publishers, 2016) for the Synthesis Lectures in Human Language Technologies series.

David Kaufer is the Mellon Distinguished Professor of English and Rhetoric at Carnegie Mellon University. His research interests focus on rhetorical theory and computational textual analysis from a rhetorical perspective.

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