

2015

Cohesion and Perceived Proficiency in ITA Oral Communication across Engineering and the Sciences

Jennifer Haan

University of Dayton, jhaan1@udayton.edu

Follow this and additional works at: http://ecommons.udayton.edu/eng_fac_pub



Part of the [Arts and Humanities Commons](#)

eCommons Citation

Haan, Jennifer, "Cohesion and Perceived Proficiency in ITA Oral Communication across Engineering and the Sciences" (2015).

English Faculty Publications. Paper 89.

http://ecommons.udayton.edu/eng_fac_pub/89

This Book Chapter is brought to you for free and open access by the Department of English at eCommons. It has been accepted for inclusion in English Faculty Publications by an authorized administrator of eCommons. For more information, please contact frice1@udayton.edu, mschlangen1@udayton.edu.

Cohesion and Perceived Proficiency in ITA Oral Communication across Engineering and the Sciences

By Jennifer Haan,¹ University of Dayton

International Teaching Assistants (ITAs) often require additional instruction because their speech is not easily understandable. This lack of perceived proficiency may be attributable to mistakes in sentence level grammar or pronunciation, but may also be affected by discourse level structures including overall organization and coherence of talk. This chapter examines spoken data from an ITA proficiency test to better understand the relationship between cohesion – the linguistic property used to build coherence – and perceived comprehensibility of ITAs. The study analyzes the use of cohesive ties (such as pronouns and conjunctions), across different proficiency levels in order to characterize and describe how ITAs at varying levels of language proficiency use different patterns of discourse in their talk. Results indicate that although ITAs at lower proficiency levels do use cohesive ties, they display difficulty using certain types correctly, and are more likely to have unproductive pauses when attempting extended discourse. These results have significant implications for ITAs teachers and mentors interested in developing strategies to help ITAs use extended discourse for the professional purpose of teaching. The strategies include consciousness-raising activities for ITAs as well as sample outlines of organizational

1. Author contact: jhaan1@udayton.edu

schemas from science and engineering with particular importance placed on framing words and cohesive ties.

Successful teaching requires the use of extended discourse. Classroom instructors use lectures, tutors develop extended explanations and definitions, and laboratory instructors provide instructions and descriptions. Across different contexts and classrooms, it is vitally important for international teaching assistants (ITAs) to be able to talk in a way that is comprehensible to their undergraduate students. And, while it is sometimes easy to recognize when an ITA is comprehensible in the classroom, it is much more difficult to define the specific characteristics that lead to, or detract from, that comprehensibility. Undergraduates, when complaining about ITAs, often attribute their lack of understanding to the ITA's "accent" or "pronunciation," or may even focus on the instructor's "grammar." Certainly, violations of expected pronunciation patterns or syntactic structures do play an important role in impeding intelligibility (Tyler, Jefferies & Davies, 1988), but it is easy to fall into the misconception that comprehensibility *only* relates to sentence-level grammatical accuracy and pronunciation. It is easy to forget the role that discourse level features play in the overall spoken ability of ITAs. The types of classroom talk, however, that ITAs must be able to use involve discourse units that are longer than phrases or sentences. Therefore, when trying to describe the specific language features that comprise communicative ability in the classroom, it is important to move beyond the sentence to understand how the structure of the discourse can facilitate or detract from successful communication. If we can better understand how features of longer discourse affect the perceived comprehensibility of ITAs, then we can teach ITAs how to use those features effectively to better communicate with their students.

This chapter looks at ITA oral communication beyond the sentence level to examine which features in longer units of discourse affect the perceived communicative ability of non-native English speaking international graduate students who are participating in an ITA testing and training program. In particular, the study uses 40 spoken responses from an ITA English proficiency test to examine discourse features related to cohesion, including the use of cohesive ties and pausing, across longer units of spoken text. The study

asks: 1. What types of cohesive ties are used across different proficiency levels of speech that either facilitate or detract from overall comprehensibility? 2. How are these cohesive ties used differently across different proficiency levels? and 3. What additional linguistic features play a role in facilitating or detracting from the overall coherence and comprehensibility of ITAs' extended discourse? Throughout the chapter I describe the relationship between the use of cohesive ties and perceived communicative ability, and also describe how ITA educators, whether from the field of ESL or not, can address cohesion to help ITAs develop more comprehensible and coherent speech, and thus more effectively communicate ideas to U.S. undergraduates.

Literature Review

Key Terms in Second Language Learning: Communicative Competence and Discourse Competence

Communicative competence. Throughout the 1970s and 1980s the second language learning/applied linguistics community shifted the focus of language teaching and learning from grammatical accuracy to communicative competence. Communicative competence is "the ability to function in a truly communicative setting – that is, in a dynamic exchange in which linguistic competence must adopt itself to the total informational input, both linguistic and paralinguistic, of one or more interlocutors" (Savignon, 1972, p. 8). This definition broadens the view of language proficiency to include aspects other than the correct usage of grammatical rules. ITA educators coming from the English as a second language (ESL) field have used this concept of communicative competence as a starting point for ITA instruction and training, focusing specifically on the ways that ITAs communicate in an authentic academic classroom setting. More recent definitions of communicative competence have included a number of more narrowly construed competencies which ITAs must be able to perform in order to be successful. See Table 1.

Table 1. Components of Communicative Competence

Competence	Definition	Examples
Grammatical competence	The ability to correctly employ the sentence-level linguistic code of the language.	Correct use of tenses, articles, pronunciation, intonation.
Sociolinguistic competence	The way in which the linguistic code can be manipulated appropriately in different settings and contexts.	Appropriate choice of words in the given context and audience.
Strategic competence	The ability to use compensation strategies when linguistic resources are inadequate.	Talking around a word that is unfamiliar, using specific language learning and communication strategies.
Discourse competence	The way that speakers use specific linguistic features in order to appropriately structure written and oral texts beyond the sentence level.	Connecting phrases and sentences in ways that are coherent and understandable.

Note. Drawn from Canale & Swain, 1980; Crossley, Salisbury, & McNamara, 2010; Halliday & Matthiessen, 2004; Riggan, 1999.

Although ESL specialists and ITA educators have long been interested in the role of grammatical competence in successful classroom communication, less has been written about the role of specific discourse features and their relationship to perceived communicative ability. Because ITAs are required to produce long, discourse level speech in their pursuit of teaching content to undergraduate students, the current study focuses on the feature of cohesion in developing discourse competence.

Discourse competence and ITAs. Discourse competence is the ability to produce texts beyond the clause and sentence level to “form structures, convey meanings, and accomplish actions” (Shiffron, 1994, p. 6). In the context of ITAs’ talk in classrooms, this means being able connect examples to definitions, transition from one topic to another, or explain logical connections between points in such a manner so as to help undergraduates understand the course content. This type of communicative ability is important for ITAs, and for all teachers in higher education, for a number of reasons. In their role as ITAs, non-native English speaking graduate students are expected to be able to participate in extended types of discourse in their second languages, both oral and written. As

tutors, lab instructors, and recitation leaders in engineering and the sciences, ITAs are expected to give U.S. undergraduates definitions of complex, discipline-specific terms and ideas; provide instructions for laboratory procedures, tests, and homework assignments; and respond to student questions in one-on-one tutoring sessions. They have to give extended explanations, descriptions, and examples. A deeper understanding of the features of successful extended discourse can help ITAs develop these types of talk in ways that are clear and understandable for undergraduates.

Key Terms for this Study: Coherence and Cohesion

Coherence. In order to be comprehensible, extended stretches of talk (discourse) must be coherent. Here I define coherence as a general sense of connectedness in a text. A number of features go into the creation of a coherent text: topic, theme, rationality, and development, but at its core, coherence has to do with whether or not the entirety of the discourse can be interpreted as a unit by the listener or reader (Anderson, 1995). From a psycholinguistic perspective, coherence has to do with how relationships are perceived and represented in the minds of both the speaker and the listener (Crossley et al, 2010). Because coherence has to do with relationships within the discourse, a number of features can lead to a perception of incoherence in a spoken text, in turn causing communication breakdown. For example, if an instructor begins a lecture discussing one topic and abruptly changes to a different topic, the lecture might be deemed incoherent because the relationship between the two topics is not logically defined. Similarly, if a tutor is providing instruction and her response to a question does not show a clear relationship to the question asked, her response may be considered incoherent. So, for an ITA to communicate effectively and coherently, his/her talk needs to convey relationships in ways that the listener can understand and interpret.

In order to develop coherence, speakers use both content (theme, logic, topic) and linguistic properties (words and grammatical constructions). The use of linguistic properties to develop coherence is called cohesion, and it involves the use of vocabulary items (often termed cohesive ties or discourse markers) to build

relationships (Halliday & Hasan, 1976; Liao, 2009) and strategic pausing to show phrasal structure (Chiang, 2011).

Cohesion. If coherence is the global sense of interconnectedness of the ideas in speech communication, then cohesion comprises the specific *linguistic* tools speakers use to bring this coherence about. According to Halliday and Hasan (1976), cohesion is brought about when speakers use vocabulary and grammatical structures to indicate connected meaning both within and across sentence boundaries. Some examples include the use of conjunctions, the use of clearly connected phrases (through rhythm, intonation, and pausing), and thought groups (Chiang, 2011), and the use of repeated words or synonyms.

Cohesion is integral in creating a unified, coherent meaning in spoken texts, and the vocabulary words and grammatical structures used to bring this about are often referred to as cohesive ties, which “enable readers or listeners to make the relevant connections between what was said, is being said, and will be said” (Castro, 2004, p. 215). The definition of cohesive ties goes back to Halliday and Hasan’s 1976 work, but variations on these cohesive features in both speaking and writing have been examined under a wide variety of terminologies, including “discourse markers” (Fung & Carter, 2007), “cohesive devices” (Lui & Braine, 2005), and “small words” (Hasselgreen, 2005). All of these terms are used to describe the specific lexico-grammatical features that speakers use to build relationships between different parts of the discourse. Speakers use these linguistic features in combination with logical content and/or argumentation to build an overall coherent discourse. The current study uses Halliday and Hasan’s 1976 theoretical framework to focus specifically on the relationship between the use of cohesive ties and overall comprehensibility. See Table 2.

Table 2. Types of Cohesive Ties

	Definition	Types	Classroom Examples
Referential Cohesion	Lexical items which must be interpreted in accordance with another element in the discourse. Two categories are exophoric – referring to concepts outside the text and endophoric – referring to an item within the text.	Pronominals	<i>For homework, do the binomial equations in the book. They are on page seven.</i>
		Demonstratives	<i>You should always show your work. That is part of being a good student.</i>
		Definite articles	<i>We are learning about Newton's 3rd law. The law states that...</i>
		Comparatives	<i>Some students study very little. Those who want good grades study more often.</i>
		Collocation	<i>In the fraction 4/5, 4 is the numerator and 5 is the denominator.</i>
Substitution	The replacement of one lexical item with another item that is not a personal pronoun	Nominal	<i>Read problems 1-30 in your textbook. Complete the even ones.</i>
		Verbal	<i>Take your time to work through the problems. Doing them quickly will lead to errors.</i>
Ellipsis	Substitution by zero	N/A	<i>Are you returning our tests on Friday? I am. (returning your tests)</i>
Conjunctive Cohesion	The use of conjunctions, connectors, or transitional words to bring together clauses, paragraphs, or discourse.	Simple additive	<i>To do well in this class, you must attend each class session. You must also hand in each assignment on time.</i>
		Simple adverbative	<i>Pick partners for you next project. However, make sure you have not worked together before.</i>
		Causal and reverse causal	<i>Because you are having difficulty with the concepts, I am postponing the test until next week.</i>
		Temporal and sequential	<i>First, develop a hypothesis. Then test it.</i>
		Complex	<i>If you do not hand in your homework, then you will receive a 0 on the assignment.</i>

Notes. Drawn from Halliday and Hasan (1976). Collocation, under referential cohesion, is defined as two or more words that frequently co-occur and are used to build lexical cohesion because of their systematic, semantic relationships (*numerator/denominator, boys/girls, dollars/cents, stand up/sit down*).

Previous Research on Cohesion and Comprehensibility

A number of studies on spoken language have examined the use of cohesive ties and discourse markers in the perceived comprehensibility of speech. One study by Tyler, Davies, and Jeffries (1988) examined teaching demonstrations of eighteen Chinese and Korean teaching assistants whose students had complained about their ITAs' language ability. They noted: "although pronunciation problems do contribute to their comprehensibility...even if their pronunciation were NOT a source of difficulty, these students would STILL be perceived as being incoherent by American English listeners" (p. 102). They argued that discourse structure is as important as pronunciation when it comes to communicating effectively.

A second study by Tyler (1992) looked at the discourse patterns of a Chinese graduate teaching assistant's spoken English and compared it with that of a native speaker of North American English. The Chinese teaching assistant's English had been perceived as hard to follow by native English speakers, and Tyler contended that the ITAs' use of discourse structuring devices caused breakdowns in communication. The ITA in her study mixed different types of lexical discourse markers, starting the lecture with sequential discourse markers such as *and then* and *after that*. The ITA then shifted to additive markers such as *also* and *and*. According to Tyler, "the additive markers give ambiguous signals. It is not clear if they are signaling the elaboration of an already established topic or the introduction of a new major point" (p. 719). From this analysis, Tyler suggested that discourse-based differences contribute substantially to communication difficulties, and are, therefore, important to address. Additional studies have also found that the correct and explicit use of discourse markers and cohesive ties can lead to *greater* comprehensibility. Publishing in the same year as Tyler, Williams (1992) found that ITAs who used explicit connecting words to build relationships between sentences were rated as more comprehensible than those who did not.

How cohesive ties are used and the issue of "distance." As shown previously, existing research has indicated that using a greater number of cohesive ties increases comprehensibility in extended discourse. But it may be the case that the use of these cohesive ties is only helpful in facilitating communication when they

are used correctly and there is not an over-reliance on a particular form. So, it is not only the number of ties that seems to matter, but also the way that the ties are used. If the ties are used incorrectly, or only a narrow range of cohesive ties are used or are overused (such as *yeah*, Liao, 2009), then the extended discourse and talk of TAs may sound incomprehensible to listeners.

An additional factor seems to be *distance* between the referent and the word to which it refers. The lower the distance between the tie and the reference, the more discursively competent the extended speech will be. Compare: *Here is your assignment. It begins on page 54*, with *Here is your assignment. After you read through the chapter we will be having a quiz and conducting an experiment. It begins on page 54*. In the second example, because of the distance between the tie and the referent (*assignment* and *it*), the meaning of the cohesive tie is obscured. A large distance between a cohesive tie and the referent could involve a longer length of time, perhaps due to pausing, or could also involve the insertion of additional phrases or sentences, as can be seen in the second example. Although previous studies have provided important information about how ITAs use cohesive ties and discourse markers to build coherence and increase comprehensibility, more information is still needed to understand how non-native speakers are using these lexico-grammatical features in speech.

How Other Linguistic Features Add to or Detract from Comprehensibility

Although not usually addressed in formal theories of cohesion, some previous research indicates that linguistic features such as rate of speech and pausing patterns are of significance to the overall comprehensibility of second language learner speech. Excessive pausing has been found to be especially problematic when it comes in the middle of phrases and sentences, and breaks up “focus clusters” of information (Chafe, 1985). When considering the comprehensibility of non-native speaker teaching assistants, Rounds (1987) states, “if there is not a smooth flow of talk with silences at phrase boundaries...students may begin to lose what is commonly called the train of thought. Such silences tend to diffuse attention rather than focus it” (p. 654). These silences also lead to a lack of cohesion in the text by increasing the distance between cohesive ties and their referents.

Research Questions

The current study examines the use of cohesive features across different proficiency levels of an Oral English Proficiency test given to ITAs at a large research university. The overall research purpose is to explore ITA candidates' use of cohesive ties such as one of the tasks of an Oral English Proficiency Test. The current study adds to the literature cited above, and in addition makes suggestions easily adapted to program-level, course-level, and mentor-level interventions. In particular the research asks:

1. What types of cohesive ties are used across different proficiency levels of oral communication that either facilitate or detract from overall comprehensibility?
2. How are these cohesive ties used differently across different proficiency levels, in terms of number and distance from referent?
3. What additional discourse level linguistic features such as rate of speech and pausing patterns play a role in adding to or detracting from the overall coherence and comprehensibility of the extended discourse?

Method

Participants

The study participants were 40 international graduate students with a variety of first languages including Korean, Chinese, Arabic, Bengali, Turkish, Ukrainian, Kannada, and Greek. The participants were matriculated students who were enrolled in engineering or science graduate programs. These students were typical for international graduate students going through an Oral English Proficiency Program at the institution where this study took place. In this program, students typically take a locally constructed oral proficiency test, which is described in the Materials section below. The test is given to determine if they can be placed as a TA in a classroom with U.S. students, or if they need additional training and instruction in English before taking up their teaching. Typically students take this test at the beginning of the preparation program, after participating in a short online orientation. Students' responses are recorded in this test, some of which formed the data set for this

study. After testing, ITA candidates' responses are scored and put into proficiency levels. For this study, ten recordings from each of the four higher levels of proficiency were randomly selected, resulting in 40 samples of responses to a specific item on the test. Because the language samples were rendered anonymous and collected randomly from among a pool of responses, and because the samples comprised existing data routinely captured for program purposes, the study was exempt from review by the Institutional Review Board.

The participants' responses to the items on the test were scored by holistically by two independent raters on a scale from three to six. Participants with scores of three and four were deemed not comprehensible enough to be placed in a classroom, and were asked to complete a one-semester oral English course before becoming TAs, while individuals getting scores of five and six were considered comprehensible and proficient enough to be exempt from the course. They could immediately be certified to begin teaching or serving in an instructional capacity in contact positions with undergraduates. If participants did not take this local oral proficiency test, they could also achieve certification by scoring a 27 or higher on the speaking section of the TOEFL iBT (Educational Testing Service, 2014; see also Griffiee & Gorsuch, this volume), a 76 or higher on the Pearson Test of Spoken English, or a 50 or higher on the Test of Spoken English (TSE).

Materials

The main material for this study was an Oral English Proficiency Test designed to test the oral English ability of international graduate students who were offered funding to be TAs at a large U.S. research institution. The test, designed by applied linguists and ESL-based ITA training specialists, has been in use for over ten years, and consists of seven items which were thought to capture the graduate students' ability to communicate in a variety of academic situations. The test item tasks include a read-aloud of an institutional document, a graph interpretation task, an opinion response task, a compare and contrast task, a giving advice task, a pass-on-this-information memo item, and a pass-on-this-information telephone message item.

Table 3. Oral Proficiency Test Items

Read Aloud	Graph Interpretation	Opinion Response	Compare and Contrast	Advice Giving	Pass on Information: Memo	Pass on Information: Telephone
Test takers read aloud a provided university document.	Test takers are given graphs to explain and interpret.	Test takers read and respond to a short opinion piece.	Test takers compare and contrast different texts.	Test takers give advice to a student with a problem.	Test takers read a memo and pass the information on to a colleague.	Test takers hear a voicemail message and pass the information on to a colleague.

The test takers are given two minutes to think about their answers and then respond, out loud, to the prompts given. They are given a maximum of two minutes to respond, but they do not have to talk for the entire two minutes. The test is semi-direct and computer-based, and test takers' responses are monologic; that is, there are no interlocutors.

This study focuses specifically on participants' responses to the advice-giving item, which elicits speech that is spontaneously constructed without the aid of other types of written materials (such as graphs or articles). The prompt states:

Dear instructor,

In one of my other classes, I have a foreign teaching assistant. I believe that you are both from the same country. My problem is that I cannot understand anything she says. If I come to your office hours today, can you please give me some advice about how to handle this?

Respectfully,
Joe Smith

Procedure and Analysis

The 40 speech samples were transcribed and coded according to the number and type of cohesive ties, sample length, and rate of speech. In order to answer RQs #1 and #2, I analyzed the use of cohesive ties according to Halliday and Hasan's (1976) framework, including their classifications of five primary classes of cohesive ties: reference, substitution, ellipsis, conjunction, and lexical cohesion (see Table 2). After these five categories were coded, they were then broken down further into sub-types of reference (pronominal, demonstrative or definite article, or comparative), types of conjunction (additive, adversative, casual, and temporal), and types of lexical cohesion (reiteration or collocation)(see Table 2). To better understand how these features were used across different proficiency levels, after the items were coded, I analyzed the cohesive ties for their number and density across different proficiency levels, the distance between the cohesive tie and the referent across proficiency levels, the type of cohesive ties across proficiency levels, and the manner of use of the cohesive ties across levels. In order to address research question 3, I analyzed additional discourse level linguistic features, namely rate of speech and pausing, across different proficiency levels to determine their effect on the perceived comprehensibility and proficiency of the speakers.

Results and Discussion

Research Questions 1 and 2. The research questions were: 1. What types of cohesive ties are used across different proficiency levels of oral communication that either facilitate or detract from overall comprehensibility? 2. How are these cohesive ties used differently across different proficiency levels? An analysis of the use of cohesive ties across proficiency levels revealed that students in the two highest levels, five and six, used both more and different types of cohesive ties than students at middle levels three and four. Table 4 below summarizes the general findings; these are then explained in more detail in each section thereafter. Please refer to Table 2 for a review and examples of cohesive ties.

Table 4. Average Number and Characteristics of Cohesive Ties Across Proficiency Levels

	Level three	Level four	Level five	Level six
Number of referential ties	6	9	11	12
Characteristics of referential ties	Use of personal pronouns only in reference to the prompt (<i>she, her</i>).	Use of personal pronouns in reference to prompt, plus additional pronouns (<i>it, that</i>) in reference to other issues or problems.	Use of personal pronouns and additional pronouns, additional inclusion of relative pronouns (<i>which, that</i>).	Use of personal pronouns and additional pronouns, additional inclusion of relative pronouns (<i>which, that</i>).
Number and characteristics of ellipsis and substitution	None	None	None	None
Number of conjunctions	7	9	14	14
Characteristics of conjunctions	Few conjunctions, 95% simple additive (<i>and, also, but</i>); incorrect use of simple connectors.	65% simple (<i>and, also, but</i>), generally used correctly; also include internal temporal connectors (<i>first, second</i>) inconsistently.	Only 56% simple (<i>and, also, but</i>). Consistent use of different types of conjunctions including internal temporal, causal (<i>because</i>), and complex conjunctions (<i>if...then</i>).	Only 54% simple (<i>and, also, but</i>). Consistent use of different types of conjunctions including internal temporal, causal (<i>because</i>), and complex conjunctions (<i>if...then</i>).
Number of repeated words (lexical cohesion)	8	7	4	4
Characteristics of repeated words (lexical cohesion)	Reliance on non-productive repetition (<i>This...this... this...problem</i>).	Reliance on non-productive repetition (<i>You should talk... talk</i>).	Less repetition overall, more repetition to strategically connect ideas.	Less repetition overall, more repetition to strategically connect ideas.

Referential cohesive ties. The most common references across all of the levels were given in reference to the advice prompt (Table 3). These, first of all, included pronomial reference items such as *she* and *her* to refer to the teaching assistant described in the prompt. A second common reference to the prompt was in the use of the demonstrative article *this* as well as the definite article *the* when talking of *the problem* or *the situation* that was described in the prompt. Higher-level participants seemed more willing to use pronomial, comparative, and demonstrative articles than participants at the lower levels. In level three, only one respondent made use of referential items to refer to anything in her discourse other than *the problem* and *the TA* in the prompt. In levels four through six, however, additional pronomial and demonstrative reference items were used. Participants at these higher levels seemed more comfortable using these reference items to talk about elements other than within the prompt itself. Many used *it*, *this*, or *these* to refer to the advice they were giving; they also used *that*, or *this* to refer to notes or materials from the imagined class. Some used *them* or *they* to refer to other students. These subtle trends suggested that students at higher levels of proficiency were more comfortable with the ambiguity of reference that can sometimes come with the use of referential ties. Level three participants, on the other hand, seemed to prefer to repeat lexical items directly from the test prompt so as to avoid this ambiguity, rather than build cohesion by way of referential items.

One additional difference between the middle level (three and four) and the higher level (five and six) participants had to do with their use of relative pronouns such as *who* or *which* as referential ties. Eight of the ten participants at levels five and six made use of at least one relative pronoun in their responses. This use was significantly lower at the level four, while at level three, no participants used relative pronouns in a subordinating clause. Participants at the higher levels displayed the ability to use relative pronouns to build cohesion. This seemed to be an indication of their ability to use referential cohesive ties to develop more complex sentences, while building relationships between concrete and abstract people and ideas.

Ellipsis and substitution. No evidence of either ellipsis or substitution was found across any of the recorded responses in

the Oral English Proficiency Test Data. This is likely due to the fact that both of these types of cohesive ties are found most often in oral communication between two or more people. Although this test examines oral proficiency, the item chosen here did not elicit interactive speech.

Conjunction. Data indicates that while participants in all proficiency levels used a number of transitional devices within their discourse, these connectors became more prevalent and complex for participants in the higher levels. Participants in level three used the fewest number of conjunctions in their responses, averaging only seven per two-minute response. These participants used simple additive connectors such as *and* and *also* most frequently in their discourse. 54% of the level three responses is the conjunction *and*, and if *also* is added to that, the two ties together comprise 64% of the conjunction use. Virtually all of the conjunctions participants used in level three fall into the categories of simple additive, simple adversative, or simple causal. Some examples of these conjunctive ties from participants in level three were:

- (1) *I think you can ask him or her to speak slowly...and...uh...you should encourage him to express himself...freely.*
- (2) *I also had the similar experiences.*

Although the level three participants used these types of simple connectors, including *but* and *so*, they sometimes experience difficulty using them in expected ways. One level three participant said:

- (3) *I'm sorry...but...I will try to talk with her about this problem.*

The use of the adversative conjunction *but* in relation to the *I'm sorry* leads the listener to expect something negative. By following the conjunction with a positive statement, the listeners' expectations are confounded. Other examples which may confound listeners were the simple causal conjunction *so*:

- (4) *She wants to always wants to help you...so...uh...the problem between you and her come from always come from communication.*
- (5) *The problems are...uh...overcome by written and reading form...so...I know you have the difficult procedure.*

The use of *so* prepares the listener for a causal relationship between the two parts of the discourse (i.e. *she wants to help you, so feel free to talk to her*); but instead, the speakers go back to reiterate the problems and difficulties. The cohesive tie *so*, then, has the effect of leaving the listener waiting for a causal relationship while the speaker goes on to address a different topic altogether.

In the level four speech samples, participants used *and* in 54% of the total number of conjunctions, much like level three respondents. 65% of all the lexical cohesive ties are simple conjunctions. Each respondent at this level included some type of either internal temporal or correlative sequential conjunctive tie. These conjunctions are used to organize the discourse and move it from one point to the next, and include such connectors as *first, second, finally, and next*. Although the level four test takers used these connectors to try to give direction to the text, they did not use them consistently and therefore potentially violating the expectations of the listeners. In other words, just because a participant used *second* as a connector, he or she did not necessarily mean there was an explicit *first* or *third* spoken.

Participants in levels five and six did not differ from each other, but together they differed from level three and four participants in their consistent use of internal temporal and correlative sequential conjunctions. This was also true for their use of complex conjunctive constructions such as *not only...but also* as well as reversed causal connectors such as *because*. These participants were engaged in a higher level of discourse in that they were not only giving advice, *per* the test item, but were also giving reasons for that advice. They are able to construct the discourse using appropriate cohesive ties to demonstrate that logical connection.

- (6) *My best advice would be to go and talk to him about it **because** um you need to get a good grade.*
- (7) *I would suggest you to uh go to the professor uh who's in charge of this course and talk to him about the situation **because** the situation is completely inappropriate.*
- (8) ***Not only** is this situation a problem for you, **but it is also** a problem for other students.*

In addition to using reverse causal connectors to offer reasons for their advice, participants at levels five and six were able to hypothesize about a variety of situations by using *if...then* constructions. The ability to use these complex constructions allowed the test candidate to be specific in his/her advice to the student.

- (9) *If I can't be of any assistance, **then** I'll try to find someone who will be able to help you out.*
- (10) *If you think speaking to her is not going to make any difference and that um she is really not going to be able to help you then maybe it would be a good idea to go and speak to the person who has assigned the teaching assistant to your class.*

The participants made use of complex conjunctival relationships which allowed them to be more specific and enhance their perceived proficiency in the role as a teacher using English. They also brought different types of cohesive ties together in close proximity to each other in the utterance in order to show the logical connections between points. Both examples (9) and (10) included simple additive conjunctions, complex "if...then" conjunctival statements as well as relative pronouns for subordination. This potentially allows listeners to attend more easily, thereby increasing the perception that the speaker is proficient in English.

Lexical cohesion. In all four of the levels examined (see Table 4), the participants reiterated terms such as *the problem*, *the situation*, or the *teaching assistant*. This simply means that some participants used words more than once in their discourse to connect ideas. Participants in levels three and four incorporated a higher percentage of reiteration throughout their test responses than did participants in levels five and six. At first glance, this may suggest a higher overall cohesive quality to the spoken responses, but upon closer analysis, this reiteration might actually detract from the coherence of their talk. Participants at levels three and four seemed to be using reiteration not as a cohesive tie, but rather as a type of non-productive lexical item which might be used to compensate for limitations in vocabulary.

- (11) *You cannot **understand...understand** her talking.*

- (12) *I also have...have...similar...similar problem.*
- (13) *It can help you to make up for...make up for what you... what you left behind.*

Research question 3. The research question was: What additional discourse level linguistic features play a role in facilitating or detracting from the overall coherence and comprehensibility of the extended discourse? From the data, two additional features emerged as significant discourse level factors impacting the overall coherence and comprehensibility of participants' extended discourse. These were the rate of speech, and the number and type of pauses in talk. Even though it is natural for fluent speakers of a language to have a certain amount of pausing within a two-minute talk, an analysis of participants' responses in this study indicated that as one goes up in terms of test levels three, four, five, and six, the number and length of pauses used by participants decrease. The test candidates were given a two-minute time limit to talk, but they were not required to talk the entire two minutes. Eight of the ten level three participants talked for two minutes, but because of their slow rate of speech and excessive pausing, they said fewer words in two minutes than participants in levels five or six said in one minute, on average. Stated in numerical terms, participants in level three averaged .77 words per second. Level four participants averaged 1.48 words per second, and level five participants used 2.23 words per second on average. Level six participants used on average 2.43 words per second.

Certain types of pausing, particularly pausing in the middle of phrases (example 14) and pausing that increases the distance between anaphors and their antecedents (examples 15 and 16), may reduce the comprehensibility of extended talk. Here are examples from participants in levels three and four:

- (14) *I understand your [pause] situation.*
- (15) *The problem is [pause] a [pause] difficult [pause] difficult [pause] problem.*
- (16) *The teaching assistant has [pause] problem [pause] the problem [pause] she [pause] has to improve [pause] her [pause] English.*

During these pauses, the participants seemed to be searching for a word or a grammatical form. This caused them to pause within information units, and seem less proficient in English.

Discussion and Implications for ITAs

This study presented a qualitative analysis of ITAs' extended talk across different proficiency levels. See Table 5.

Table 5. Characteristics Across Proficiency Levels

Proficiency Level	Rate of Speech	Repetition/Pronoun use	Use of Conjunction
Level 3	Slow speech (.77 words/minute), pausing within phrases and constituents.	Excessive repetition of words, particularly unproductive repetition. Little use of pronomial reference (<i>it, this, she</i>), rather continued repetition of nouns.	Incorporation of few conjunctions, primarily simple additive connectors (<i>and, also</i>); often misuse conjunctions.
Level 4	Somewhat quicker speech (1.43 words/minute), continued pausing within phrases as well as extended time between anaphor and antecedent.	More use of personal and demonstrative pronouns, some unproductive repetition, but less than at the lower level.	Use of conjunctions, but rely heavily on simple additive, adversative, or causal; include temporal and sequential conjunctions as well (<i>first, second; next</i>).
Level 5	Acceptable rate of speech (2.23 words/minute), some pausing, and not within phrases or constituents.	Little unproductive repetition, personal and demonstrative pronouns are used, additionally relative pronouns are used to subordinate clauses and build cohesion.	Use of temporal and correlative sequential conjunctions as well as complex conjunctival constructions (<i>not only...but also</i>) and reversed causal connectors (<i>because</i>)
Level 6	Faster speech (2.43 words/minute), fewer pauses overall, pauses at appropriate phrase boundaries.	Repetition is used primarily to build cohesion, personal and demonstrative pronouns are used, additionally relative pronouns are correctly used to subordinate clauses and build cohesion.	Use of temporal and correlative sequential conjunctions as well as complex conjunctival constructions (<i>not only...but also</i>) and reversed causal connectors (<i>because</i>)

For ITA mentors and instructors across different disciplines, an awareness of these differences in discourse patterns at different levels of proficiency can be helpful both to identify ITAs and ITA candidates at particular proficiency levels, and then provide instruction so as to improve their speech comprehensibility. If ITA educators and mentors recognize the importance that cohesion plays in the comprehensibility of extended talk, then they can provide ITAs with important tools for developing the needed skills. ITAs can be taught to notice the ways that referential items and conjunctive ties organize discourse in lectures, explanations, and discussions. This type of explicit noticing instruction can help the students to increase their awareness of these types of discourse markers and the ways they are used in their disciplines.

Noticing activities. Mentors and ITA instructors can use a variety of noticing activities to help ITAs see the way that discourse is structured. Here is one: The following excerpt is from *A Handbook for Mathematics Teaching Assistants* published by the Mathematical Association of America (2014).

Calculus is usually split into two types: differential and integral. Differential calculus deals with instantaneous rates of change: how things change right now, not over six years or ten miles (those are average rates of change), not over six seconds or six one-hundredth of a second, but right now, this instant. We will be learning about this instantaneous change this so-called derivative, how to find it, how to manipulate it, and how to use it in problems from physics and chemistry to business and economics. For instance, if the instantaneous change takes place over time, then this derivative is the velocity of the object that is moving, and this concept is of special interest to physicists and engineers; it is one of their tools for explaining the physical world. When Isaac Newton wrote $F = ma$, for instance, he was saying that forces are related to acceleration, and acceleration is a derivative, a rate of change.

To help students better understand how repetition, conjunction, and discourse markers are used in this type of lecture, mentors can have ITA candidates read this type of text doing different tasks. As a first step, ITAs can read through the text looking for repetition of terms and ideas for cohesion (*differential, derivative, instantaneous, etc.*) and discuss how this repetition shapes the discourse and helps

to move it along. We can see, for example, that already in the first line the repetition of the term *differential* helps to organize the talk because it becomes clear that the overall lecture will be about two types of calculus, but at this moment the instructor is discussing the first type (*differential*).

As a second step, ITAs can also find pronouns throughout the excerpt and discuss how those pronouns make connections between different parts of the text. ITAs can discuss the use of the pronoun *it* when referring back to *derivative*. Mentors and ITA instructors might point out that the pronoun is used in close proximity to the antecedent to which it refers, but when the lecturer begins a new sentence about the same topic, the noun can be repeated rather than the pronoun, to avoid potential ambiguity. ITAs can be led through a discussion of the use of the demonstrative *this* to build connections, particularly when talking about the derivative. Instructors and mentors can draw ITAs' attention to different types of conjunctions and discourse markers throughout the text that help to organize it. Some of these are simple (*and, or*), but there are also more complex ties including *not...but* as well as *if...then*, and *for instance*. Finally, once ITA candidates are able to notice these cohesive ties, instructors and mentors can guide ITAs to develop lecture excerpts of their own using appropriate cohesive ties. For example, mathematic ITAs could be asked to think through and compose a paragraph addressing integral calculus along the lines of the structure presented in the excerpt above.

Providing models, outlines, and handouts. In addition to these types of noticing activities, ITA educators and mentors in engineering and the sciences can also provide models, outlines, or handouts to help ITAs incorporate cohesive ties appropriately according to the discourse conventions of their fields. Wankat and Oreovicz (1992) note that when teaching beginning level engineering students, "organiz[ing] the lecture in a linear, logical fashion" (p. 94) can be helpful. The same authors encourage engineering teachers to "include stage directions in their lecture notes" (p. 95). ITA educators and mentors could provide outlines of different discourse organizational schemes in lectures, brief explanations, recitations, and lab instructions using the types of conjunctive ties typical to the lecture context, so that ITAs can more appropriately organize their discourse. Here is one example: One of the tasks of

many newly-arrived ITAs in the sciences is to lead laboratory sections. Because lab experiments are procedural by nature, the use of internal temporal conjunctions, such as *first*, *second*, *third*, are of importance in instructing undergraduate students on the relationships between steps in the experiment. ITA mentors can offer a sample outline that includes these types of cohesive ties. When ITAs are developing their own procedural instructions, they can follow the example. See Table 6.

Table 6. Sample Lab Procedure

<u>Sample Lab Procedure</u>	<u>Sample Outline</u>
<i>First, add 5 drops of ionic liquid to the test tube. Then, record your observations.</i>	<i>First...</i>
<i>Second, add 5 drops of a second ionic liquid to the same test tube.</i>	<i>Then...</i> <i>Second...</i>
<i>Third, mix the liquids using a clean stirring rod.</i>	<i>Third...</i>
<i>After you have mixed the liquids, record your observations.</i>	<i>After...</i> <i>Then...</i>
<i>Then, repeat the experiment in a different tube with different solutions.</i>	

Felder (2000), suggests that much instruction in engineering and the sciences takes place using an explanation plus practical application or example discourse structure. This is a communication context where the relationships between different segments of the discourse must be clearly delineated in order for students to follow the flow of the activity. ITAs can be provided with sample organizational schemas, to show the relationships between explanation and application. See Table 7.

Table 7. Schema for Explanation Plus Example

Sample Schema for Explanation plus Example	Sample Organization
<p><i>In this section we are going to talk about function and function notation.</i></p>	<p><i>In this section...</i></p>
<p><i>First, what is a function? An equation is a function if for any x in the domain of the equation the equation will yield exactly one value of y.</i></p>	<p><i>First...</i> <i>Now...</i></p>
<p><i>Now, let's look at an example.</i></p>	<p><i>Example 1...</i></p>
<p>Example 1 <i>Determine if each of the following are functions.</i></p>	<p><i>This first one...</i></p>
<p>(a) $y = x^2 + 1$ $y = x^2 + 1$</p>	<p><i>This second one...</i></p>
<p>(b) $y^2 = x + 1$ $y^2 = x + 1$</p>	<p><i>Now...</i></p>
<p>Solution</p>	
<p><i>(a) This first one is a function. Given an x, there is only one way to square it and then add 1 to the result. So, no matter what value of x you put into the equation, there is only one possible value of y.</i></p>	
<p><i>(b) This second one is not a function. The only difference between this equation and the first is that we moved the exponent off the x and onto the y. This small change is all that is required, in this case, to change the equation from a function to something that isn't a function.</i></p>	
<p><i>Now we need to take a quick look at function notation...</i></p>	

Note. Adapted from tutorial.math.lamar.edu

This explicit instruction and modeling of cohesion in discourse can make ITAs feel more comfortable in the overall structuring of their explanations, while at the same time providing their students with tools to understand the material being discussed. ITAs need to develop the ability to present coherent extended discourse in English. As shown in this report, this involves more than a focus on sentence level grammar and pronunciation. Attention to cohesion as a feature of coherent and comprehensible speech is indispensable to build ITAs' repertoire for successful professional communication.

In a Nutshell

1. In longer oral and written discourse (language use beyond the sentence level), cohesive ties play an important but complex role in organizing texts and aiding listener comprehensibility.

2. 40 two-minute recordings of ITAs at four different levels of proficiency were analyzed for cohesive ties. ITAs were assigned to middle proficiency levels 3 and 4, and higher proficiency levels 5 and 6 according to a locally administered speaking performance test designed to determine ITAs' readiness to teach.
3. There were marked differences in how ITAs at different levels of proficiency used cohesive ties, resulting in less, and more, comprehensibility.
4. Participants at levels 5 and 6 seemed more able to incorporate relative pronouns (*which, that*) to correctly develop subordinate clauses (*This small change is all that is required, in this case, to change the equation from a function to something **that** isn't a function.*)
5. At lower-level 3 participants used fewer conjunctions to relate ideas together, and often used conjunctions incorrectly (overuse of *so*). At higher-level 4, participants were able to use more conjunctions and more correctly, but continued to rely on simple conjunctions. Participants at levels 5 and 6 were able to use complex conjunctions (*because* and *if... then*).
6. Repetition of ideas may, in some cases, increase cohesion in talk. However, ITAs at lower proficiency levels upon arrival used excessive, unproductive repetition, where ideas were being repeated in very close proximity without regard for cohesion. ITAs tested at higher levels, however, were able to use repetition to build connections between different parts of their talk (*This small change is all that is required, in this case, to **change** the equation from a **function** to something **that** isn't a function.*)
7. As participants' proficiency level increased, so did their rate of speech. At lower levels, pauses within units of information and phrase boundaries, and excessive listening time between antecedent and anaphor seemed to lead to a lack of comprehensibility (*The problem is [pause] a [pause] difficult [pause] difficult [pause] problem.*)
8. ITAs can benefit from noticing activities which help them to pay attention to the kinds of cohesive ties used to organize speech in academic settings. ITA instructors and mentors

- can build these types of activities into their instruction or mentoring by having ITAs listen to in-discipline lectures while focusing on cohesive ties such as productive repetition, and conjunctions.
9. Mentors and instructors can provide sample outlines of discourse to show how to use connecting words and cohesive ties to organize their speech. References

References

- Anderson A.H. (1995). Negotiating coherence in dialogue. In M.A. Gernsbacher & T. Givon (Eds.), *The negotiation of coherence* (pp. 41-58). New York: John Benjamins.
- Canale, M. & Swain, M. (1980). Theoretical bases of communicative approaches to second language teaching and testing. *Applied Linguistics*, 1, 1-47.
- Castro, C. (2004). Cohesion in the social structure of meaning in the essays of Filipino college students writing in L2 English. *Asia Pacific Education Review*, 5, 215-225.
- Chafe, W. (1985). Some reasons for silence. In D. Tannen & M. Saville-Troike (Eds.), *Perspectives on silence* (p. 77-89). Norwood, New Jersey: Ablex.
- Chiang, S. Y. (2010). Pursuing a response in office hour interaction between U.S. college students and international teaching assistants. *Journal of Pragmatics*, 43, 3316-3330.
- Crossley, S., Salisbury, T. L., & McNamara, D. S. (2010). The role of lexical cohesive devices in triggering negotiations for meaning. *Issues in Applied Linguistics*, 18(1), 55-80.
- Educational Testing Service (2014). *TOEFL iBT: About the test*. Available: <https://www.ets.org/toefl/ibt/about>
- Felder, R.M. (2000). The future of engineering education II. Teaching methods at work. *Chemical Engineering Education*, 34, 26-39.
- Fung, L., & Carter, R. (2007). Discourse markers and spoken English: Native and learner use in pedagogic settings. *Applied Linguistics*, 28(3), 410-439.
- Halliday, M.A.K., & Hasan, R. (1976). *Cohesion in English*. London: Longman.
- Halliday, M.A.K., & Matthiessen, C. M. I. M. (2004). *An introduction to functional grammar*. London: Arnold.
- Hasselgreen, A. (2005). *Testing the spoken English of young Norwegians: A study of test validity and the role of "smallwords" in contributing to pupils' fluency: Studies in language testing*. Cambridge: Cambridge University Press.
- Liao, S. (2009). Variation in the use of discourse markers by Chinese teaching assistants in the U.S. *Journal of Pragmatics*, 41, 1313-1328.

- Liu, M., & Braine, G. (2005). Cohesive features in argumentative writing produced by Chinese undergraduates. *System*, 33(4), 623-636.
- Mathematical Association of America (2014). *A handbook for mathematics teaching assistants*. Available: <http://www.maa.org/programs/students/student-resource/a-handbook-for-mathematics-teaching-assistants>
- Riggenbach, H. (1999). *Discourse analysis in the language classroom*. Ann Arbor: University of Michigan Press.
- Rounds, P. (1987). Characterizing successful classroom discourse for NNS teaching assistant training. *TESOL Quarterly*, 21, 643-671.
- Savignon, S. J. (1972). *Communicative competence: An experiment in foreign-language teaching*. Philadelphia: Center for Curriculum Development.
- Schiffrin, D. (1994). *Approaches to discourse*. Oxford: Blackwell Publishers.
- Tyler, A. (1992). Discourse structure and the perception of incoherence in international teaching assistants' spoken discourse. *TESOL Quarterly*, 26, 713-729.
- Tyler, A., Jeffries, A., and Davies, C. (1988). The effect of discourse structuring device on listener perceptions of coherence in non-native university teacher's spoken discourse. *World Englishes*, 7, 101-110.
- Wankat, P.C., & Oreovicz, F. (1992). *Teaching engineering*. Purdue University: McGraw-Hill.
- Williams, J. (1992). Planning, discourse marking, and the comprehensibility of international teaching assistants. *TESOL Quarterly*, 26, 693-711.