Investigating Functional Grammar Analysis as an Instructional Tool for Meaning-Making with Fourth-Grade English Learners

by

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DEDICATION

This dissertation is dedicated to Ms. Youssef and her students.

research community's history, and my desire to become a part of this community was affirmed. As a recipient of her generous attention, I was given one opportunity after another to realize my potential. Through her example, I have learned the importance of having grace, integrity and humility in a scholarly life.

I want to thank my family who has been by my side through and through. I owe a very special thanks to my mom and dad without whom I would not be here. Thank you for all the conversations and for always believing in me. Finally, thank you to my husband, Herminso, for his unwavering support and for always cheering me on: Keep it up!

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ABSTRACT

According to the U.S. Department of Education, 9.1% (4.4 million) of the students in U.S. schools are learning English as a new language. Unfortunately, an achievement gap between English learners and their native English-speaking peers has persisted for years. It has become imperative for English learners to have equitable access to instruction that will advance their literacy development; mainstream classroom teachers must know how to meet the needs of linguistically diverse students.

Literacy and language scholars suggest this requires adopting a linguistic orientation to reading comprehension instruction with which teachers can support English learners' language development and content-area learning simultaneously. However, there are few empirical models to which teachers can turn to understand how this can occur, with what tools, and the challenges they might encounter. The present study aims to redress this gap. Stemming from *Systemic Functional Linguistics* theory, functional grammar analysis is a technique that may support teachers in bringing a linguistic orientation to meaning-making with text. This case study investigates one fourth-grade teacher's enactment of a curriculum designed to support English learners' meaning-making with a functional grammar approach.

To study the teacher's enactment over the course of a year, I employed qualitative data collection methods including field notes, video recordings, interview, and teacher artifacts. Data analysis drew on constant comparative methods and discourse analysis. This study demonstrates how functional grammar analysis provides a metalanguage with which teachers can facilitate discussions about key ideas that are central to the meanings in text. Through iterative readings of

select text excerpts and visual representations of students' emergent understandings, teachers can scaffold the analysis of word meanings and clauses to help students build causal relations while reading narrative texts and logical/referential relations while reading informational science texts. This study also reveals challenges, such as making metalanguage useful for analyzing characters and teaching both the individual stages of an argument and how the stages should ultimately cohere. For teachers and researchers interested in how we can promote the advancement of English learners' literacy development, this study illustrates how a linguistic orientation to meaning-making can be translated into a literacy and language pedagogy.

CHAPTER 1: INTRODUCTION

English Learners' Reading Achievement: A Call To Action

In U.S. schools, at least one in nine students is learning English as a second language (Goldenberg, 2011). Projections suggest that by the year 2028, this ratio will change to one in five (Goldenberg, 2008). According to Nation's Report Card (NAEP, 2013), when compared to their native English-speaking peers, English learners are not faring well in the area of reading. Since 1969, National Assessment of Educational Progress (NAEP) reading tests have been administered every two years to a large representative sample of fourth, eighth, and twelfth graders from states across the nation. Although standardized tests provide a limited view of students' capacities, the results of these assessments enable us to see the trends of students' scores by demographic groups, which is helpful when attempting to determine how well English learners are performing on these tests and in turn may suggest how well they are performing in school overall.

Not only are fourth-grade English learners performing significantly lower on the NAEP reading assessment than their native English speaking peers, the majority of fourth-grade English learners who take the NAEP are performing at the level of "below basic." This statistic is disheartening, especially considering that this has been the case for at least 15 years. Although a small percentage of English learners have moved from "below basic" to "basic" over the past 15 years, basic is still not "proficient;" it is even further removed from "advanced."

The NAEP scores indicate that English learners are struggling with reading comprehension, but we must remember that the scores may also reflect these students' struggle

with English. The scores do not reveal whether English learners are struggling with *reading comprehension* or *understanding the language* of the test—two distinct but closely related skills that will be defined in more detail below—but we know that both of these skills are essential for success on standardized tests and, more importantly, in school.

It is a moral imperative that we strive to ensure that English learners have equitable access to instructional contexts that will advance their literacy development (Goldenberg, 2011). Their large presence in U.S. schools, combined with their consistent underachievement on standardized measures of reading, is cause for great concern; it suggests that our schools are failing to meet the needs of a large percentage of students from diverse linguistic and cultural backgrounds. Historically, English learners have been placed in lower-level courses on the basis of their language proficiency; in such cases, they are deprived of opportunities to engage with grade-level texts, collaborate with peers, and use English for meaningful, academic purposes (Allen, 2002; Harklau, 1994; Scribner, 2002). Without access to high quality instruction that supports language learning as well as content learning goals, English learners are not being given opportunities to fully develop the literacy skills and capacities necessary for success in school and society.

One would think that with English learners comprising such a large percentage of the student population, there would be a significant number of instructional studies to which teachers could turn to better understand how to meet the literacy learning needs of English learners in their classrooms. Unfortunately, this is not the case. To date, in comparison to reading comprehension instructional research that has been conducted with native English speakers, there is a paucity of instructional research addressing effective literacy instruction for English learners (Goldenberg, 2011; Saunders & O'Brien, 2006; Shanahan & Beck, 2006). The history of English

learners' performance on standardized reading assessments and the lack of instructional research in this area make evident a case for providing more support—and perhaps taking new approaches in this support—for teachers who are trying to meet the needs of the English learners in their classrooms.

A Linguistic Orientation to Meaning-Making

Linguistic diversity is one of the hallmarks of the "New Mainstream" classroom (Enright, 2011). Whereas some classrooms may have only a few English learners, others may be comprised entirely of English learners, such as the classroom in the present study. Although linguistic diversity enriches society and the classroom, English is the language of instruction in most U.S. classrooms, and teachers are expected to help their students become facile with reading, writing, and speaking *in English* within a short period of time. This demands that, alongside the teaching of content, teachers also need to be able to support students' academic language development. In the upper elementary grades, this means ensuring that English learners acquire foundational literacy skills, such as comprehending texts of different genres *and* developing proficiency with English. However, most mainstream classroom teachers are not equipped with strategies and techniques for facilitating language development alongside reading comprehension.

Meaning-Making

Reading comprehension is a process of extraction and construction (RAND, 2002). Whereas extraction is synonymous with decoding print (Snow & Sweet, 2003), construction is a process of creating a coherent mental representation of the text (Kintsch, 1998; Van den Broek & Kremer, 2000). Although we can use cognitive theoretical models to explain the reading comprehension process for individual readers, meaning-making is a social process that occurs

over time through which the individual learner internalizes an understanding of the text (Vygotsky, 1978; Wertsch, 1979). Recognizing the importance of social context, the reading research community is now engaged in what Wilkinson and Son (2011) refer to as the 'fourth wave' of research on reading comprehension instruction, which is comprised of exploring the value and efficacy of dialogic practices including text-based discussions (Kucan & Palincsar, 2013). When students engage with text and the exchange of ideas through discussions, they engage in a collective process of meaning-making that involves actively interacting with texts through reading, listening, talking, and writing. When skillfully scaffolded, this social, discursive process is beneficial for all learners, particular English learners for whom oral language proficiency is positively correlated with English reading comprehension (Geva, 2006). English learners need a language-rich learning environment in which they have opportunities to engage with oral and written language for meaningful, academic purposes (Schleppegrell, 2013). For English learners, teachers also need to know how to integrate support for language development into reading comprehension instruction (Han & D'Angelo, 2009). This means adopting a linguistic orientation to meaning-making.

A Linguistic Orientation

Literacy and language scholars who are concerned about English learners' literacy development in schools have been calling for teachers to adopt a linguistic orientation to meaning-making (Fillmore & Snow, 2000; Han & D'Angelo, 2009; Schleppegrell, 2010; Turkan, de Oliveira, Lee, & Phelps, 2014). Having a linguistic orientation to meaning-making means understanding the multifaceted role of oral and written language in teaching and learning, and using this understanding to inform instructional decisions to better meet the needs of English learners (Fillmore & Snow, 2000). Referred to as *Disciplinary Linguistic Knowledge* (Turkan et

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al., 2014), this means understanding how linguistic features in text present meaning and how they do so differently across disciplines (Schleppegrell, 2004, 2011; Turkan et al., 2014). With knowledge of discipline-specific linguistic features in texts, teachers are better equipped to help English learners construct meaning with texts across genres and content areas (Schleppegrell, 2010; Turkan et al., 2014).

Coupling attention to linguistic features in text with a meaning-based approach to reading comprehension instruction provides English learners with opportunities for understanding "how meaning is encoded linguistically" (Han & D'Angelo, 2009, p. 179). Such an approach necessitates explicit attention to language in instructional texts and a systematic way of talking about language. *Systemic Functional Linguistics*, or SFL (Halliday, 1978), is a sociolinguistic theory of language development that can be translated into a practical, applied linguistic orientation to meaning-making with text for teachers and their students. In the present study, this approach is called *functional grammar analysis*.

Functional Grammar Analysis

Based on the assumption that grammar is a network of choices that serve various functions or purposes (Halliday & Matthiessen, 2014), functional grammar analysis can facilitate students' understanding of both the structure and the function of language in texts. Situated within instructional frameworks supportive of the dialogic construction of meaning, such as text-based discussions, teachers can use functional grammar analysis to facilitate discussions about both the language and the meaning in texts. Functional grammar analysis is an instructional technique that, when used in specific, flexible ways (e.g., to help students attend to the essential meanings in clause) and realized in a teacher's instructional discourse, becomes an instructional tool. A curriculum informed by SFL that provides a technique such as functional grammar

analysis may support mainstream classroom teachers in adopting a linguistic orientation to reading comprehension, and as a result, support English learners' meaning-making with texts across genres and content areas. The present study investigates a case in which a fourth-grade teacher implemented such a curriculum. Through this study, teachers and researchers can better understand the affordances and limitations of adopting an SFL-inspired linguistic orientation to meaning-making with upper elementary English learners.

This Case Study

This dissertation is an embedded case study of a fourth-grade teacher's enactment of a curriculum that was designed to support elementary English learners' literacy development. In the context of text-based discussions, the teacher used *functional grammar analysis* as an instructional tool to engage students in: (a) analyzing characters in narrative fiction texts, (b) writing character analyses, (c) interpreting science text, and (d) constructing arguments with the use of informational science texts. The teacher in this study, Ms. Youssef, and all of her students are native Arabic speakers. Most of the instruction and classroom discourse occurred in English.

My research question was: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific instructional practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with text? To answer this question, I employed qualitative data collection methods: observation field notes, audio and video recordings, a semi-structured interview, and student- and teacher-created artifacts. Data analysis drew on constant comparative methods as well as discourse analysis. The study investigated the instructional practices, opportunities, and challenges revealed in Ms. Youssef's enacted curriculum over the course of a year.

I refer to Ms. Youssef's students as "English learners" because I recognize that in the classroom her students are constantly faced with the challenge of learning both the content and English as a second language. But I use the term "English learners" with caution. Students who are learning English as a second language in U.S. schools are referred to with a variety of labels (e.g., English language learners, second language learners, emergent bilingual students, students with limited English proficiency, L2 learners, bi-literate learners). A label is, by nature, limiting for a group of individuals who come from diverse socioeconomic backgrounds and represent a vast range of identities, languages, home countries, cultures, dialects, religious affiliations, cognitive aptitudes, degrees of motivation, interests, and ages. In no way does the term "English learners" convey the diversity of students who can be characterized in terms relative to their learning of English.

This study grew out of my work with the Language and Meaning project. The Language and Meaning project was a three-year, design-based research project that was directed by co-principal investigators Mary Schleppegrell and Annemarie Palincsar and funded by the Institute of Education Sciences. The project's team (of which I was a member) consisted of the two principal investigators and several graduate students in the Educational Studies department in the School of Education at the University of Michigan. In the Language and Meaning project, we worked together to integrate principles of SFL (Halliday, 1978) into a language arts curriculum, and investigate how such a curriculum could support reading and writing instruction with elementary students who were learning English as a second language.

To translate principles of SFL into a language arts curriculum, the Language and Meaning team adopted a functional approach to the teaching of "how language means" (Halliday, 1993). This functional approach to understanding the language in the text was referred

to as *functional grammar analysis*. This instructional approach was *functional* in the sense that it served content-driven, meaning-making purposes. With an accompanying metalanguage, functional grammar analysis can give readers a way to analyze the meanings of language in texts. For English learners, for whom meaning in text is not immediately apparent, this metalanguage can be a crucial tool for understanding general notions of meaning across the genres students typically encounter in school (Schleppegrell, 2004). Meaning-making is central to the study presented here.

In the Year 3 Language and Meaning curriculum, the Common Core State Standards for English Language Arts (National Governors Association Center for Best Practices, 2010) and the school district's science content goals defined the purposes for reading and responding to text. These curricular goals and the sociocultural, sociolinguistic theoretical orientations underpinning the design of the curriculum helped define the construct of meaning-making for each unit of instruction.

The organization of this dissertation is as follows. In Chapter 2, I review the theoretical and empirical literatures that inform this work. In Chapter 3, I discuss my research methodology. In Chapters 4 through 7, I present the findings from each of the four units of instruction. Finally, I conclude with Chapter 8 in which I synthesize the findings, discuss the implications and limitations of this study, and suggest directions for future research.

CHAPTER 2: LITERATURE REVIEW

According to the U.S. Department of Education, 9.1% (4.4. million) of the students in elementary and secondary schools are learning English as a second language (U.S. Department of Education, 2014) . Unfortunately, these students are not faring well in U.S. schools. An achievement gap between English learners and their native English-speaking peers has persisted for years. It has become more imperative than ever before for English learners to have equitable access to instructional contexts that will advance their literacy development. Therefore, mainstream classroom teachers must know how to meet the needs of linguistically diverse students. In particular, mainstream classroom teachers need instructional techniques with which they can support English learners' reading comprehension and language learning simultaneously. SFL (Halliday, 1978) offers a theoretical foundation from which teachers and researchers can develop a linguistic orientation to reading comprehension instruction (e.g., functional grammar analysis), thereby making language and meaning in texts explicit for students who are learning English as a new language in school. As an instructional tool, the potential of *functional grammar analysis* needs to be studied in the context of a teacher's practice in the classroom with English learners and developed in response to the insights yielded from such investigations.

In this chapter, I begin my explanation of what English learners need to make meaning with texts by reviewing theories of reading comprehension that apply to readers more generally. Then I discuss the instructional implications that stem from the theories and review empirical work that provides insight on these instructional implications, particularly for English learners. Following the section on reading comprehension, I turn to a discussion of language learning.

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Based on what we know about how language develops and the expectations for students to use academic language in schools, I discuss instructional implications, which lead to a close look at functional grammar analysis as a potential tool to support English learners' meaning-making. To conclude, I explain why I have chosen to study the opportunities and challenges of a linguistic orientation to meaning-making as phenomena arising from a teacher's enactment of a curriculum situated in the context of a classroom.

What English Learners Need to Make Meaning with Text

As readers, English learners are similar to native English speakers in many respects. When reading, both English learners and native English speakers make use of the following types of knowledge: graphophonic (sound-symbol), lexical (vocabulary), semantic (meaning), syntactic (language structure), background and textual knowledge (schemata), and cognitive strategies (Garcia, 2003). However, English learners must navigate obstacles specific to the process of comprehending texts written in a foreign language. English learners' prior knowledge is encoded in their native language/s and cultures, which may make it difficult to leverage relevant background knowledge in service of making connections in and across texts written in English (Rueda, 2011). Furthermore, when English learners read texts written in English, they encounter more unfamiliar words and fewer familiar topics (Garcia, 2003), which places higher demand on working memory and increases the cognitive load (Rueda, 2011; Sweller, van Merrienboer, & Paas, 1998). English learners also have difficulty knowing when to infer and when to use the text to answer implicit questions (Garcia, 2003).

Although these challenges to comprehension are specific to English learners working to comprehend texts in English, they are not unique. Other readers, not just English learners, often struggle with these same issues (Kucan & Palincsar, 2011). For all students, teachers need to

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provide high quality reading comprehension instruction that strategically anticipates what may hobble students' meaning-making.

Theories of Reading Comprehension

Reading comprehension is a cognitive and social process (Wilkinson & Son, 2011) that is shaped by the text, the reader, the activity, and the sociocultural context in which reading is situated (RAND, 2002). Cognitive theories of reading comprehension explain how the mind processes and stores text-based information. Walter Kintsch's construction-integration theory (Kintsch, 1998) and Paul Van den Broek's landscape model of text comprehension (Tzeng, Van den Broek, Kendeou, & Lee, 2005) provide robust and complementary definitions of the reading comprehension process and the higher order thinking skills involved.

In his construction-integration model of reading comprehension, Kintsch (1998) describes two types of readers' mental representations of text: the textbase and the situation model. The textbase model represents the understanding one constructs using just the information in the text. The situation model represents the textbase model *plus* the reader's prior knowledge (Kintsch, 1998); the situation model can be represented through the reader's ability to infer, synthesize, interpret or use text to accomplish a task.

Van den Broek's landscape model also emphasizes the construction of a mental representation of the text (Tzeng et al., 2005). The landscape model depicts this construction as dynamic and cyclical, occurring during and after reading. As a reader proceeds through a text, the mind works to process the current phrase or sentence, residual information from the previous phrase or sentence, the current mental representation, and the reader's prior knowledge. The mind works to connect new concepts to previously stored information in long term memory, and

concepts are strengthened through associations and connections in the reader's effort to create a coherent mental representation of the text.

In other words, the creation of a coherent mental representation of text is contingent upon a reader's ability to 1) draw upon background knowledge, and 2) infer referential and causal/logical relations among text elements (Van den Broek & Kremer, 2000). Referential relations are made when readers keep track of people, objects and events across a text. This requires storing and retrieving information while reading. For example, when a referent word such as "he" appears in a text, the reader needs to recall to whom *he* is referring. Causal/logical relations help readers understand the connections among different people, events or facts. For example, when readers make inferences about *why* a character in a story acts in a certain way, they are inferring causal relations. When readers work to understand an informational text that explains *how* an electric current produces light in a light bulb, they are establishing logical relations. Logical relations also include understanding the sequence of things, processes or procedures. Furthermore, comprehension requires readers to know what, in the text, is deserving of their attention (Van den Broek & Kremer, 2000). A successful reader can determine what is important, attend to it, and remember it so that referential and causal/logical connections can be made. Learning how to do *this*, to comprehend text, occurs as the result of an interaction between the reader, the text and a more knowledgeable other who can mediate and scaffold this complex, language-based process (Van den Broek & Kremer, 2000; Vygotsky, 1978).

Learning to comprehend text does not occur in isolation. Learning is a social process (Vygotsky, 1978; Wertsch, 1979). "Higher mental functions" first exist in the external, social context in which the individual learner is immersed (Vygotsky, 1978). Through tools such as speech, visual and physical interactions with more skilled others (e.g., the teacher and students

with greater levels of proficiency in the skill being learned), the individual learner masters (i.e., develops proficiency) and appropriates (i.e., takes up and makes their own) new concepts, strategies and skills. As a learner's proficiency with a task becomes greater over time, the more skilled other can provide fewer degrees of scaffolding.

Instruction in Support of English Learners' Meaning-Making

Because reading comprehension is a dynamic, cognitive, and social process, teachers need to employ instructional practices that provide opportunities for groups of students to actively co-construct meaning. Through whole-class, shared readings of a text, teachers can skillfully scaffold the meaning-making process for all students. Teachers can be deliberate about text selection and limit the amount of text students read, which helps students focus their attention on the important ideas or concepts (Van den Broek & Kremer, 2000). With shorter segments of text, teachers can direct students' attention to certain aspects of the text and revisit the central concepts in different ways so that students have multiple opportunities to establish causal/logical connections necessary for comprehension. In language learning, this is referred to as *iteration* (Larsen-Freeman, 2012). Unlike mere repetition, iteration provides opportunities for learners to revisit text for various meaning-making purposes and reconstitute the context anew with each encounter (Larsen-Freeman, 2012). This iterative construction of meaning reinforces readers' abilities to learn from text.

Furthermore, the interactive nature of teacher-led, text-based discussions increases the chances for meaning-making because the students have access to the teacher's and other students' background knowledge with which they can better understand material that might otherwise be inaccessible due to a lack of relevant prior knowledge. Scaffolding reading comprehension through discussion requires teachers to constantly assess students' understanding

and skillfully respond to their contributions (Pearson & Fielding, 1991). From this shared knowledge-base and the use of causal/logical questions (e.g., questions beginning with why or how), teachers can help students remember important pieces of information, 2) infer implied meanings, and 3) synthesize the gist of what's been read, all of which are necessary for comprehension (Van den Broek & Kremer, 2000). Furthermore, this dialogic process encourages English learners' oral language development, which in turn supports reading comprehension (Geva, 2006).

Text-based discussions.

An extensive body of research on text-based discussions has confirmed the positive effects resulting from teachers and students engaging in conversations about text (Applebee, Langer, Nystrand, & Gamoran, 2003; Chinn, Anderson, & Waggoner, 2001; McKeown & Beck, 2006; Nystrand, 2006; Wilkinson & Son, 2011). Teacher-led, text-based discussions enable the teacher to guide students through a text that may otherwise be inaccessible due to the text's linguistic demands or students' lack of familiarity with the content (Kucan & Palincsar, 2013). Below, I review several studies that have examined the use of text-based discussions with elementary English learners.

Collaborative Strategic Reading.

In Klingner, Vaughn, and Schumm's (1998) exploratory study, they investigated an intervention in which they taught Collaborative Strategic Reading (CSR), a cooperative learning approach designed to foster strategic reading, to fourth graders of whom half were learning English as a second language. The students then used the strategies to talk about informational history text in small groups. The investigation included five 4th grade classrooms with heterogeneous student populations. Three of the classrooms received the intervention and the

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other two served as control conditions. Students in both conditions received the same content—a unit on Florida's economy from a Florida state history book—and students in the intervention classrooms also received reading strategy instruction. The strategies included previewing the text, click and clunk (i.e., monitoring comprehension), get the gist (i.e., determining importance) and wrap up (i.e., summarizing). Researchers provided all of the instruction in both conditions. In the intervention condition, researchers led the first three class sessions; in the remaining eight sessions, the students worked together in groups of five or six to read and learn the content through discussing the text and using the CSR strategies. In the control condition, the researcher followed the teaching guidelines in the textbook to lead whole class readings and discussions about the text.

The researchers used a pre/post reading comprehension measure (Gates-MacGinitie Reading Test) and a post content measure, which consisted of 50 questions derived from the textbook and its teaching manual. In addition, they audiotaped the small groups in the intervention to analyze the discourse for strategy usage, but only the discourse of one target group per class was analyzed. According to the results on the pre/post measures, students in the intervention showed statistically significant growth in reading comprehension, but on the content knowledge measure, there was no significant difference between students' scores in the intervention versus control condition. Klingner and colleagues' (1998) analysis of the results suggested that the children who were English learners did not respond differently than native speakers to this intervention.

Discourse analysis enabled the researchers to investigate the students' strategy use, forms of conversation, and amounts of higher-level discussion. The findings showed that the CSR groups regularly utilized three of the four strategies (preview, click and clunk, and get the gist).

Furthermore, the findings suggested the CSR groups spent over half of the time (65%) discussing academic content and a quarter of the time (25%) discussing procedures. However, only 6% of the academic content discourse reflected higher-level thinking (e.g. multiple word responses, the articulation of complete ideas, extended thinking about the meanings of word phrases). The authors speculated that the nature of the task or the text may have prohibited higher-level discussions, or perhaps the authors' strict criteria for higher-level thinking prevented them from more closely analyzing nuances of discourse which may, in fact, have reflected higher-level thinking.

The authors claimed that CSR gave English learners more opportunity for participation as compared to the opportunities typically found in whole-class, textbook reading instruction. Small groups may in fact afford more opportunities for participation and language use, which are critical for English learners, but meaning-making with the text also needs to remain foregrounded. If text-based discussions fail to promote higher level thinking about text, opportunities for participation may not lead to a coherent understanding of the text.

The majority of Klingner, Vaughn, and Schumm's (1998) findings focused on the comprehension strategies used, how often and in what way. These findings help us know which strategies students might employ in small group, student-led, content-focused textbook discussions when assigned specific roles and a protocol such as CSR. When discussions were not as successful, it seemed to be due to either students' lack of prior knowledge or students' inability to build from one another's ideas. A teacher can mediate such limitations more skillfully than students, especially when students are first learning how to have text-based discussions, and such facilitation might be necessary for English learners when they have the task of negotiating the language as well as the meaning of the text.

Instructional Conversations.

Throughout their 15 years of working in language-minority schools, Saunders and Goldenberg investigated how instructional conversations (Tharp & Gallimore, 1988) support English learners' communicative engagement with and about text. Saunders and Goldenberg (1999) examined the effects of an instructional intervention with Spanish-speaking English learners: discussion-based approaches to mediating English learners' reading comprehension of narrative fiction text. This study was conducted in a fourth-grade classroom at an urban elementary school with 82% Hispanic students, 69% limited English-proficient and 62% of the students receive free or reduced lunch. More than 75% of the fourth graders in this school were below grade level in reading. Most of the students in the class were transitioning from Spanish to English. Saunders and Goldenberg compared the effects of four different types of teacher-led, small group instruction: literature log only, instructional conversation only, instructional conversation paired with a literature log, and a control group. In phase 1 of the study, the teachers administered a pretest for which students were asked to write an essay on the meaning of "giving," a central theme in the story they were preparing to read. Several days later, the teacher provided a synopsis of the text and read aloud the first page of the six-page story. Students finished reading the story independently. Then students took a comprehension pretest measure.

In phase 2 of the study, the teachers implemented the experiment by providing the conditions mentioned above (literature log only, instructional conversation only, instructional conversation paired with a literature log, and a control group). For the literature log, teachers asked students to write about experiences they have had that were related to those of the main character. In the literature log groups, the students wrote and then read their pieces aloud. In the

instructional conversation groups, teachers aimed to develop students' literal and thematic interpretations of the story. In the instructional conversation plus literature log groups, these two conditions were paired during the 45-minute lesson. Phase 3 consisted of posttests, which were the same as the pretests.

Saunders and Goldenberg (1999) measured three categorical types of comprehension: factual, interpretive, and thematic. On measures of factual comprehension, they found that students in the instructional conversation plus literature log group scored *higher* than the students in the instructional conversation only group and *significantly higher* than those students in the literature log only or control group. On measures of interpretive comprehension, the instructional conversation plus literature log group and the instructional conversation group scored significantly higher than the control group, although the instructional conversation plus literature log produced a stronger effect than the instructional conversation alone. The literature logs alone did not yield results higher than those of the control group. The individual effect of the instructional conversation and its combined effect with literature logs produced stronger results on measures of interpretive comprehension than measures of factual comprehension. On measures of thematic comprehension, native English speakers' scores across all three experimental conditions were high, but it appears that the varying conditions supported the English learners differentially. English learners in the instructional conversation plus literature log group and the instructional conversation group showed more improvement than the native speakers on the posttest measures of thematic understanding. In the instructional conversation plus literature log groups, a large number of English learners were able to clearly articulate the theme; this was not the case in the other conditions.

These results suggest that students, English learners in particular, benefit from small

group, text-based discussions, especially when the conversations are paired with a writing task that requires some form of interpretation. It also appears that text-based discussions paired with writing are perhaps more supportive of interpretive and thematic comprehension (i.e., a situation model) than of factual comprehension (i.e., a textbase mental representation). This relationship between text-based discussions paired with writing and interpretive/thematic understanding of text is worth considering, especially in light of Klingner, Vaughn, and Schumm's (1998) finding that showed that only 6% of the discussion content in their study could be coded as higher level thinking (Klingner et al., 1998). Perhaps teacher-led, text-based discussions paired with writing can provide more scaffolding for students' higher-level thinking. On the other hand, it could also be the case that discussions of narrative text produce more interpretative thinking than discussions of informational text, which would call into question how we might recognize students' higher-level thinking in discussions about informational science and history texts. On measures of factual, interpretive, and thematic comprehension, instructional conversations on their own produced stronger effects than literature logs alone or the control group. Saunders and Goldenberg's (1999) results also show that English learners benefited more from the instructional conversations than the native English speakers. This finding suggests that best practices for English learners are not necessarily the same as those for native English speakers.

In their continued work on instructional conversations, Saunders and Goldenberg (2007) further corroborate the benefits of text-based discussions for English learners. In their 2007 study, they sought to determine if instructional conversations (IC) developed students' understanding of complex concepts and literal comprehension of stories and if so, which teacher-moves prompted this understanding. They also wanted to know if students who were

transitioning from Spanish to English could participate in instructional conversations in English about texts written in English.

This study was conducted in a fourth-grade classroom at an urban elementary school with similar demographics to their previous work: 93% Hispanic students, 88% limited English-proficient students and 80% of the students receive free or reduced lunch. Three-quarters of the students in this school were below grade level in reading. Most of the students in the class were transitioning from Spanish to English. Students were randomly assigned to a control or IC group, with four groups total. The students read a short story about friendship and then engaged in either an IC or a control group conversation, which resembled a recitation. Pre and post essay questions about friendship, classroom video and instructional discourse were analyzed.

Their findings suggest instructional conversations can facilitate a more nuanced interpretation of literature, greater degrees of literal comprehension, and English-based oral participation from students who are transitioning from Spanish to English. In this study, unlike Saunders and Goldenberg's previous study (1999) discussed above, the high- to middle - achieving students (as rated by their teacher) benefited more from the instructional conversations than those with lower levels of English proficiency. This suggests that students with lower levels of English proficiency may benefit equally from recitation or instructional conversations. More direct display questions may serve as a springboard for students who can benefit from guided literal interpretations of text rather than more open-ended conversations (Boyd & Rubin, 2006). However, for those students with greater levels of English proficiency, more evaluative questions requiring more abstract thinking position them to develop more sophisticated analyses of text. The findings from Saunders and Goldenberg (2007) imply that mainstream classroom teachers need to have a repertoire of instructional strategies and discourse moves that can be used flexibly

to meet the needs of English learners who possess varied degrees of English language proficiency.

ESL pull-out, small-group instruction.

In their observational study of teacher discourse moves during text-based discussions, Boyd and Rubin (2006) examined the effects of teacher questioning. This study was conducted in a 4th and 5th grade ELL classroom over a period of six weeks. The six students in this pull-out classroom spoke three different native languages and came from homes with a wide range of parental education and literacy levels. The students themselves were all in at least their second year of learning English. Classroom observations, videos of instruction, and interviews with the teacher were analyzed. Challenging the assumption that *display* questions—questions to which the teacher knows the answer—limit student contributions, the findings in this study suggest that in text-based discussions, the *type* of question matters less than the nature of the teacher's response to students' contributions. Contingent response and questioning paired with a lack of evaluation of students' contributions yielded student participation that was extended, coherent, and socially engaged. These findings suggest teacher-directed classroom dialogue, characterized by contingently responsive teacher behaviors (including display questions and authentic questions), promotes students' oral English language use during text-based discussion. Although the model portrayed in Boyd and Rubin's study resembled recitation, it did not restrict student contributions or turn taking. On the contrary, the text and the teacher's questions provided a scaffold for English learners' communicative exchanges.

Several years later, Boyd (2012) drew from data used in the study above to illustrate how the teacher adjusted her instruction to address students' struggle with meaning-making as they read and discussed a poem. In the episode Boyd analyzed, the teacher had originally planned to

use two poems to help students compare and contrast the different ways whales can be viewed. Although the first poem was challenging for the students, the teacher refrained from simply telling the students the meaning of the poem. Instead, she repeatedly redirected students' attention back to the text and asked questions aimed at student reasoning. As a result, they spent three-quarters of the instructional time on one poem. The teacher self-reported a concern about not meeting her *content* goals (comparing and contrasting how whales were viewed in the two texts), but Boyd argues that the teacher's flexibility and willingness to divert from her original instructional objectives allowed for more opportunities for student talk, interpretive authority, and idea generation. In contrast to Boyd and Rubin's earlier analysis (2006) discussed above, the conversation in this episode allowed for even greater degrees of English learners' interpretive authority.

Limitations of small-group participation structures.

All of the studies reviewed thus far have employed small-group participation structures (Boyd & Rubin, 2006; Boyd, 2012; Klingner et al., 1998; Saunders & Goldenberg, 1999, 2007). Small groups can allow for needs-based instruction; and yet, with small-group participation structures, it is difficult for the teacher to ensure that all students are receiving the necessary supports to optimize their learning (Klingelhofer, 2014). For example, in Idding's (2005) case study of a second-grade classroom, she wanted to know how the English learners were integrated into the *community of practice* (Lave & Wenger, 1991), defined as "learning involving participation in the practices of a given community" (Iddings, 2005, p. 166), and how English learners gained access to those practices. The teacher primarily used small-group participant structures. During reading, the English learners received less rigorous instruction, below their cognitive abilities for their age (e.g., phonics-based skill practice), while the other groups,

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comprised of native English speakers, read and discussed grade level literature. If English learners are placed in homogeneous small groups without the necessary scaffolds for engagement with grade level text, they miss opportunities to learn grade-level content while reading and speaking in English for academic purposes.

Similarly, Gebhard (2004) investigated the practices of Web Magnet school at the school level and the individual student/family level by shadowing three English learners and interviewing their parents to investigate the ways the school facilitated—or failed to facilitate—these students' integration into the community of practice. In this case, the English learners were not given low-level, skills based work, but they also were not successfully integrated into the classroom's common literacy practices. Gebhard observed a reading and writing workshop structure in which students were expected to work independently for large blocks of time while the teacher conferred one-on-one with students. The lack of teaching and explicit instruction during the large blocks of independent work time made it difficult for the English learners to learn the practices, norms, forms of knowledge, language and skills that were seemingly automatic for the rest of the children in the class.

The Idding (2005) and Gebhard (2004) studies highlight the potentially problematic nature of unguided, small group participation structures, especially for English learners who need more explicit language instruction and scaffolding. In contrast, during whole-class instruction a teacher can use instructional techniques to scaffold the reading of grade-level, content-rich material, and students have the opportunity to participate—directly or peripherally—in the communicative meaning-making process (Lave & Wenger, 1991; Wertsch, 1979).

Summary of instruction in support of English learners' meaning-making.

Scholars in the field of reading comprehension recognize the complexity of mediating the reading comprehension process for a group of diverse learners, each of whom possesses unique culturally and linguistically informed networks of prior knowledge (Kucan & Palincsar, 2011; Rueda, 2011). English learners face challenges such as not having the prior knowledge needed to make sense of a particular text, encountering unfamiliar words and concepts, and not knowing when to infer or use the text to answer implicit questions (Garcia, 2003). Text-based discussions can support English learners in navigating these challenges. Meaningful, guided conversations about text support oral language development (Boyd, 2012; Klingner et al., 1998) and comprehension (Saunders & Goldenberg, 2007), especially when paired with a written response (Saunders & Goldenberg, 1999). When leading discussions with learners who posses a range of English proficiency, teachers can ask questions that support both literal and interpretive thinking and respond to students as individual readers and as a group during reading (Boyd & Rubin, 2006; Boyd, 2012). However, due to the language demands in academic texts and tasks, mediating reading comprehension through text-based discussions is not sufficiently supportive of English learners' meaning-making. Teachers also need to provide explicit attention to the language in texts (Goldenberg, 2008; Schleppegrell, 2013). In the section below, I turn to the linguistic aspect of meaning-making for English learners.

A Theory of Language Learning

SFL is a sociolinguistic theory developed by Michael Halliday that explains how language is learned and used for meaning-making purposes in social contexts (Halliday, 1978). By studying how infants develop language through interactions with their caregivers, Halliday (1980/2004) illustrated and explained the stages of language development from birth forward.

Even before they have words to express their feelings or thoughts, infants communicate with their caregivers through sound and gesture. The exchange between a child and a caregiver scaffolds the child's understanding of how language is used. The responsiveness of the caregiver and her explicit feedback (e.g., gestures, facial expressions, pauses in turn-taking) teach the child how to communicate (Menyuk & Brisk, 2005). Through the caregiver's constant use of words and association of words to objects and people, the child begins to learn that words have meaning. Meaning is co-constructed through both the child's attempts to convey feelings and thoughts with a limited vocabulary, and the caregivers' responses that serve to extend the conversation into more fully formed phrases and sentences. These dialogic interactions mediate shared understanding; this meaning-making process is the foundation of language development.

Halliday's theory of language development is consistent with sociocultural theories of development in which meaning-making is a social, collective phenomenon mediated by language (Vygotsky, 1978, 1986; Wells, 1994) . Language develops through interacting with others for the purpose of sharing experiences and enacting relationships. As illustrated above in the review of literature on text-based discussions with English learners, teachers can provide opportunities for students to use oral language as a means for constructing understanding about text, and in doing so teachers create a social context in which language is used for meaningful, academic purposes. Halliday's theory of language development also illustrates the need for *explicit attention to language* and *feedback to learners* as they work on producing the language. Therefore, to support language learning within a meaningful social context, teachers need to be explicit about the language in texts across genres and content areas. In other words, teachers need to adopt a linguistic orientation to meaning-making.

A Linguistic Orientation to Meaning-Making

In addition to understanding the multifaceted roles of oral and written language in teaching and learning, a linguistic orientation to meaning-making involves understanding how the language in texts differs across disciplines and genres and being explicit about the language in instructional texts. To be explicit about language, teachers need metalanguage, a systematic way of talking about language. Functional grammar analysis is an instructional tool that teachers can use to talk about the language and the meaning in texts.

Teacher knowledge about language.

Teachers need to develop their own awareness about oral and written language and how it can be used for a variety of purposes, all of which are essential to English learners' success in school (Fillmore & Snow, 2000). As SFL makes clear, understanding how language shapes meaning-making requires exploring how language is used, for what purposes, and in what contexts (Martin & Rose, 2007). If teachers understand how language is used differently across disciplines and genres, they are better equipped to make the features of academic English explicit for students. To clarify, I use the term *academic English* to refer to the forms of English used and found in classroom discourse and texts. (For a more thorough treatment of this term, see Schleppegrell, 2012, 2013; Snow & Uccelli, 2009; Turkan et al. 2014.)

Understanding the role of oral and written language.

In addition to having frequent interactions with people who speak English fluently, English learners need to learn from people who know English well enough to explain how the language works and how it can be used (Fillmore & Snow, 2000). Aspects of academic English—both oral and written—need to be explained explicitly by more knowledgeable others. Using academic, discipline-specific language to talk about meanings in text requires the ability to

move along a continuum of mode from everyday meanings to abstract, technical, 'academic' meanings (Schleppegrell, 2004). If teachers want English learners to use language to talk about text, or any abstract academic concepts (e.g., matter and energy), it is helpful to start with the concrete 'here-and-now,' and through various forms of scaffolding, mediate the students' ability to use discipline-specific language to talk about abstract ideas (Gibbons, 1998, 2004, 2015). But this process is not unidirectional. English learners also need to be supported in moving *from* academic meanings *to* everyday meanings, flexibly navigating modes as they work to make meaning with concepts in text.

Disciplinary linguistic knowledge.

The knowledge for teaching about the language in texts, and the ways in which authors use language in texts to achieve particular purposes, has been referred to as *Disciplinary Linguistic Knowledge* (Turkan et al., 2014). In addition to content knowledge and pedagogical content knowledge (i.e., the specialized knowledge teachers need to teach) (Shulman, 1986), teachers need disciplinary linguistic knowledge to meet the academic language learning needs of their students (Turkan et al., 2014). When teachers have disciplinary linguistic knowledge, they understand how authors use particular linguistic features to present subject matter and how authors do so differently across disciplines (Fang & Schleppegrell, 2008). For example, in the discipline of history, the text in history textbooks is usually structured as short passages in which authors use language to retell events, describe, or explain (Fang & Schleppegrell, 2008). By understanding discipline-specific linguistic features, teachers can model how to use metalinguistic tools to analyze text, and in doing so, help make content accessible to English learners (Turkan et al., 2014). In the case of history texts, teachers can ask three metalinguistic questions to help students think about how authors use language to present key ideas: *How did*

the author organize this section? What is going on in the text? What is the perspective of the author? (Fang & Schleppegrell, 2008). But teachers often do not have the necessary linguistic knowledge that would enable them to analyze how texts are typically structured within a discipline, and in turn, use this linguistic knowledge to support English learners' meaning-making with content-area texts. As an area of research in teacher learning or professional development, much more work is needed. "One largely unexplored reason L2 learners have trouble learning to use disciplinary discourses, especially in print, is that teachers often have not developed an explicit understanding of how language works in the texts they routinely require students to read and write in school" (Gebhard, Chen, Graham, & Gunawan, 2013, p. 108). If teachers know how to analyze the language of instructional texts, they can support their students in doing the same in the context of text-based, meaning-making endeavors (Fillmore & Snow, 2000; Harman, 2013; Kucan, Hapgood, & Palincsar, 2011; Schleppegrell & Go, 2007). In addition to understanding how discourse differs across disciplines, teachers need to become familiar with the principle of *genre*.

Genre.

The Common Core State Standards for reading and writing use genre as an organizing principle (National Governors Association Center for Best Practices, 2010). For reading, they recommend students read literature (e.g., stories, drama, poetry) and informational texts (e.g., literary nonfiction and historical, scientific and technical texts). Aligning with the NAEP's framework for reading, the CCSS recommend that in and before fourth-grade, students read 50% literary and 50% informational texts. Between fifth and eighth-grade, the ratio changes to 45% literary and 55% informational. By twelfth grade, the CCSS recommends students' reading to consist of 30% literary and 70% informational texts. Students need to be able to read and

respond to a variety of genres across the grades and across content areas. If teachers have knowledge about how language differs across genres and can make genre-specific linguistic forms and patterns explicit for students, students can make cross-disciplinary connections as they use linguistic resources to interpret and learn from different genres.

Genre can be defined in many ways. In this conceptual framework, I draw upon two complementary definitions from the fields of linguistics and education respectively. Scholars from the SFL and applied linguistics traditions define genre as "a staged, goal-oriented social process"(Martin, 2009, p. 13) or "abstract, socially recognized ways of using language" (Hyland, 2007, p. 149). Genre has also been defined as "recurring and recognizable communication with particular communicative purposes and particular features to accomplish those purposes" (Duke, Caughlan, Juzwik, & Martin, 2012, p. 6). These definitions share three central features: different genres reflect particular purposes (i.e., they are goal-oriented); those purposes are rooted in communicative (i.e., social) processes; and genres have recognizable features (i.e., stages and language features).

A text's genre is a realization of the author's purpose. When authors write in recognizable, patterned ways to achieve particular purposes, pieces of text can often be classified by genre (e.g., narrative fiction, informational science, poetry). However, it is important to note that within a macro-genre or overarching purpose for a text, sub-genres can and often do exist (Martin, 2009). Authors draw upon multiple grammatical and structural resources to accomplish their purposes and rarely are these purposes accomplished by using only one genre.

Disciplinary knowledge is represented in different ways through various genres. Genres differ because of the ways authors use language to present ideas or information, and there are patterns in the ways language is used within genres (Christie, 2012; Martin & Rose, 2008;

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Schleppegrell, 2004). In narrative texts, authors use language to describe characters, setting, problems and relationships. In informational history texts, authors primarily use language to describe or explain historical/social events, people and places. In informational science texts, authors mainly use language to describe or explain scientific processes, phenomena and concepts. In SFL, many other genre types have also been described, each with its own stages and common linguistic features (see Martin & Rose, 2008 for further discussion).

Each genre presents affordances and challenges. "Narrative genres are used to share and interpret past or present experiences (real or imagined) the author has lived, has researched or knows about" (Duke et al., 2012, p. 28). Narratives are story-like in their structure. By their very nature, narrative genres allow for high degrees of subjectivity. They reveal an author's personal bias, perspective, and cultural orientation to how and what is written. This is not to say that informative texts are culturally or perspectively "neutral," but given the purpose of narrative text, personal perspectives (either of the author or characters in a story) are, unlike informational texts, central to the genre. Given that there is a preponderance of narrative text in the elementary grades, it is critical that students learn how to recognize narrative features and use metalinguistic tools that help them unpack implicit meanings in the narrative genre. Students also need language with which to interpret texts for purposes of discussing and responding to narrative texts.

Informational texts are challenging for several reasons as well. In science texts, authors use technical vocabulary to name, classify, and/or describe complex structures, processes and phenomena (Fang & Schleppegrell, 2008). For many young readers, especially English learners, this vocabulary may be unfamiliar until students have had substantial exposure to concepts. Another challenge is the level of abstraction in science texts. Processes are often packaged into

abstract nouns; this nominalization can require some careful monitoring of comprehension as the reader has to work to decipher implied cause and effect relationships that can be omitted in nominalization (Fang & Schleppegrell, 2008). Endophoric referents (e.g., this, that, they) can present an additional challenge in informational texts (Schleppegrell, 2004) To establish referential relations throughout a text, a reader must track to what or whom a pronoun refers (Van den Broek & Kremer, 2000). Informational texts also have their affordances, especially for English learners. Since informational texts often present scientific or historical information, learning the language of a discipline enables readers to build discipline-specific, schematic networks of vocabulary and gain familiarity with how ideas are typically presented in disciplinary texts. Because technical texts are often written to present information objectively, meaning-making does not require as much interpretation as narrative fiction texts.

As is evident, narrative and informational texts possess linguistic affordances and challenges for English learners. Students will encounter both genres throughout school so from the earliest grades on, students should have many experiences reading and writing both narrative and informational texts. Historically, students in the lower elementary grades have not had sufficient exposure to informational texts (Duke, 2004), despite the fact that in the later elementary years and onward, most academic content is communicated using informational genres (Fang & Schleppegrell, 2008). Concerns about the challenges of informational texts and the belief that students find narrative texts more interesting have discouraged teachers from using informational texts in the younger grades (Cervetti, Bravo, Hiebert, Pearson, & Jaynes, 2009).

In their study of genre, topic, and reader preference, Cervetti and colleagues (2009) investigated students' understanding of two different science topics: snails and the formation of sand. Using two different genres (fictional narrative and informational science), 74 third and

fourth-grade students read about these two topics and the researchers interviewed the students individually after reading. The researchers asked a series of comprehension questions designed to measure students' conceptual understanding of each topic. The results indicated that the reading of the informational science texts yielded greater and more accurate knowledge of the science topic. The reading of the fictional narrative genre, on the same topics but written in a style commonly found in children's literature in which science concepts are anthropomorphized in order to make the content more appealing or engaging for young students, actually led to misconceptions about the content. As it turned out, based on questions about interest and preference, students did not prefer the fictional narrative to the informational science text.

Although English learners' reading comprehension was not a central focus in the Cervetti et al. (2009) study, 33% of the students in the sample were English learners. In their discussion of the results, the authors make several valuable points about the relationship between genre and accessibility for English learners. Some people believe narrative texts are easier and more entertaining to read because of their story-like structure, but narratives can actually be more challenging for English learners (Cervetti et al., 2009). Much more so than informational texts, narrative texts reflect implicit cultural biases, and the stylistic, colloquial language can often be challenging to navigate without having the prerequisite insider-knowledge of the author's culture, including geographic as well as temporal influences on language.

Cervetti and colleagues (2009) cite Hiebert's (2007) work on the comparison between narrative and informational texts in which Hiebert explains the text factors that make informational texts easier for English learners. Informational texts provide footholds for English learners, including the repetition of key vocabulary that is central to the information presented in the text. Bernhardt (2006) , also cited in Cervetti et al. (2009), has provided a clear set of reasons

why narratives are more difficult for English learners; these include: assumed background knowledge, frequent use of metaphors and idioms, and the economical use of language (Cervetti et al., 2009, p. 505-6).

Cervetti and colleagues' (2009) research also helps to distinguish genre from topic. It is important to recognize that science and social studies content standards can be taught through a variety of genre, but as Cervetti and colleagues (2009) found, informational text leads to fewer misconceptions, can be equally if not more engaging than narrative texts, and provides more footholds with which English learners can comprehend the text and build conceptual understanding. To build content knowledge through reading texts (in school and beyond), students need a healthy curricular diet of informational texts from the earliest grades forward (Duke & Bennett-Armistead, 2003). As educational research has indicated and as the CCSS for language arts specify, this curricular imbalance relative to the genres students read needs to be redressed. To encourage familiarity with varied genres, teachers need to understand genre-specific text features, and in turn, make the purposes—and the linguistic challenges and affordances—of both informational and narrative texts explicit for all students, especially English learners.

Explicit attention to language in texts.

Unlike a first language that can be learned implicitly through experiences with the language, second language acquisition requires both meaningful experiences with the language *and* explicit instruction of syntax, grammar, vocabulary and pronunciation (Goldenberg, 2008; Han & D'Angelo, 2009), especially if the goal is to be able to use the target language in academic and professional settings. To ensure English learners have access to what can often be a 'hidden curriculum,' different registers (everyday versus academic) and the contexts in which

they are used need to be made explicit (Schleppegrell, 2004). Second language learners benefit from instruction that makes the grammatical structures of the target language explicit (Andringa, de Glopper, & Hacquebord, 2011), but rather than teaching language explicitly in isolation, language learners benefit from interactions with materials designed to highlight form-meaning relationships and activities that foster learners' communication about grammar (Pica, 2005) in authentic contexts of use.

Since spoken and written language are the primary mediums through which content is communicated and learned in schools (Fang & Schleppegrell, 2008), discussions about text provide the ideal meaning-making context for explicit attention to language. Explicit attention to language in meaningful academic contexts promotes academic language development (Schleppegrell, 2013). By explicitly highlighting features, forms and patterns of language in texts as they are characterized and typified by genres, disciplines and content (Fillmore & Snow, 2000), teachers encourage the linguistic consciousness-raising and attention needed to develop language (Ellis & Larsen-Freeman, 2006). To be explicit about language in texts, teachers need a systematic way of talking about language with students.

Metalanguage: A systematic way of talking about language in texts.

In SFL, language is described as having three overarching metafunctions—the interpersonal, the ideational, and the textual—that are all simultaneously realized in every clause. Language is used to enact relationships (interpersonal); represent experience (ideational); and organize text so that it moves along (textual) (Martin & Rose, 2007). We can analyze a clause, using SFL, to recognize the language resources that realize each of these metafunctions. To analyze language, we need a *metalanguage* with which to talk about language (Halliday, 1980/2004). "A 'metalanguage' is a language that is used to talk reflectively and to some extent

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systematically *about* language use" (Locke, 2010, p. 70). A metalanguage enables us to, in essence, take a bird's eye view of language itself and examine it through a lens with which we can understand how the relationships among its features, structures, and ideas present meaning.

For example, when analyzing a sentence and its meaning, readers can begin by identifying what is referred to in SFL as the *process* (i.e., what is happening in the sentence). This is not limited to the verb but rather includes the verb and the other words that communicate what is happening. In the sentence, "Tomás stood in front of the library doors" (Mora, 1997), the phrase "stood in front of" would be the process. This entire phrase constitutes the meaning of what is happening. In SFL, various discourse systems associated with the interpersonal, ideational, and textual metafunctions offer various metalinguistic terms that can be used to analyze and discuss text (Martin & Rose, 2007). *Process* is one of the terms, or grammatical resources, associated with the ideational metafunction; a *process* is one part of a family of resources that are used to convey and share experience. A constellation of ideational terms (i.e., participants, processes, circumstances of time and place) is used to describe one set of relationships within SFL's complex theoretical model, which consists of multiple layers and intricate networks designed to explain how language functions as a meaning-making system. In the present study, my discussion of an SFL-inspired metalanguage is delimited by the ways in which select metalinguistic features were incorporated into an English Language Arts curriculum designed for elementary classroom teachers and students. (For a more thorough treatment of SFL as a theory and a system for understanding the English language, see Martin & Rose, 2007.)

As a tool for meaning-making, Halliday (1978) explains that acquiring a metalanguage itself is not the end goal of analyzing the language in texts. Reading comprehension instruction informed by a linguistic orientation to text should remain focused on constructing meaning rather

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than the memorization of metalinguistic terms or labeling of language features. As a functional approach to grammar, learning about how authors use language should support students' understanding of the relationship between language and meaning.

As a matter of fact, the metalanguage for text analysis can initially be implicitly embedded within reading comprehension instruction. If teachers apply metalinguistic knowledge in their own analysis of instructional texts when planning, their knowledge of the text can guide their instruction even if they choose to not explicitly introduce metalinguistic terms. For example, rather than asking students to find the *process*, if teachers ask questions such as "What's happening? What's going on in this sentence?" they can elicit the identification of the process without explicitly using SFL-inspired metalanguage. Perhaps initially, approaching text analysis without the added cognitive load (Sweller et al., 1998) of learning a metalanguage for analysis can give students access to functional ways of thinking about text without having to use new terminology for linguistic features during discussions about text. Once the foundation of analysis is established, specific metalanguage can be introduced and used over time to become a shared discourse. To further illustrate how metalanguage can be used as an instructional tool in English Language Arts, I turn next to several empirical studies that have investigated teachers' use of an SFL-inspired metalanguage to support English learners' literacy development.

Functional Grammar Analysis with English Learners

In this section, I review some empirical studies that have investigated teachers' use of an SFL-inspired metalanguage to support English learners' reading and writing. I review two studies from the Language and Meaning Project, the larger research project from which this dissertation stems. These two studies focused on teachers' use of metalanguage in the context of teaching students how to interpret narrative texts. Then I review a study conducted with 3rd and

4th grade students in which a teacher employed an SFL genre-based approach to teaching students how to analyze the features and stages of informative/explanatory texts so that they could produce their own texts in that genre.

Using a Functional Grammar Metalanguage to Analyze Text

To investigate the instructional potential of an SFL-inspired functional grammar metalanguage, Schleppegrell (2013) studied the instructional discourse in second-grade classrooms from Years 1 and 2 of the Language and Meaning project. In a professional development institute, teachers were introduced to the four speech functions (according to SFL): offer, statement, question, and command. Primary functions of speech can be described using these four categories. Teachers were also introduced to the grammatical moods—declarative, interrogative and imperative—that are realized in speech and writing. In the first episode presented in this study, the teacher facilitated a whole-class, text-based discussion about a narrative fiction text. The teacher's questions about *mood* and *speech functions* supported an extensive discussion about how a speech function (e.g., commanding) can be communicated through various moods. Through a discussion about the language in the text, students made realizations about language use in general, such as the different ways one message can be delivered*; how* someone says something is just as important as *what* they say. Learning the metalanguage of speech functions and moods helped students classify the language in the text to have a better understanding of the author's craft, English language more generally, and the meanings implied in the text.

Authors of narrative texts use different speech functions and grammatical moods in characters' dialogue to implicitly convey characters' attitudes and relationships, which, in narrative texts, are central to the meanings. Through helping teachers understand these subtle

differences in speech functions and mood, they are better equipped to help their students recognize how implicit and subtle characterizations are encoded linguistically in narrative texts.

In the second episode presented, a different second-grade teacher and her students were engaged in a text-based discussion about a different narrative text. The teacher asked her students to identify a character's *doing processes* as a way to track how the character changed from the beginning of the story to the end. Through a whole-class discussion about the character's doing processes, the teacher was able to recognize how particular abstract segments of text were a source of confusion for some students. The discussion about the language in the text, aimed at understanding the character and supported by the metalanguage of *doing processes*, enabled the teacher to scaffold students' analysis of the character's actions.

In both cases presented in this study, the teachers' students, most of whom were English learners, were supported in constructing meaning by using metalanguage to talk about the language in the text. These findings suggest that, given appropriate supports, elementary classroom teachers can use a functional grammar metalanguage to make aspects of language concrete, explicit, and meaningful in the context of language arts instruction.

In their investigation of how teachers can support students' analysis of characters in narrative texts, Moore & Schleppegrell (2014) examined data from Year 2 and reported findings from three different classrooms in grades 3, 4 and 5. They found that the SFL-inspired functional grammar metalanguage supported explicit talk about figurative language for the larger purpose of analyzing characters in narrative text. For example, with the metalanguage of *positive/negative*, *turned up/turned down* and *process types*, teachers were able to support students' participation in extended, analytical discussions about characters' attitudes. These findings suggest that an SFL-inspired metalanguage can be used as an instructional tool to bring

explicit attention to specific linguistic features in text within the context of meaningful

discussions aimed at constructing disciplinary knowledge (e.g., character analysis in literary

texts).

In 2014, Gebhard, Chen, and Britton reported on a longitudinal study of one 3rd/4th grade

ESL teacher who used SFL to support English learners' reading comprehension and writing

development of informative/explanatory texts (Gebhard, Chen, & Britton, 2014). Lynne, the

third author and focal teacher in this study, had four years of ESL teaching experience. During

the time of data collection, she was enrolled in a master's degree program and teaching ESL full

time at an elementary school. She had been selected for this study based on a presentation she

gave on SFL as part of her degree program and three of her ESL students were selected as case

study participants for this study.

Data sources included the instructional units developed as a result of the authors'

collaborative planning, classroom observations of Lynne's enactment of the lessons, and

students' writing collected before, during, and at the end of the study. The collaborative

instructional planning between Lynne and the researchers supported Lynne in her use of an SFL

genre instructional approach. Over the course of three units of study, Lynne used model texts to

help her students deconstruct the structure and function of historical, biographical, and scientific

explanations, and then the students wrote their own explanatory texts. Although the authors

make no claims about the causal link between a literacy pedagogy informed by SFL and the

students' overall gains, they suggest that Lynne's methodical and systematic use of particular

SFL metalanguage (e.g., *processes* and *participants*) along with explicit instruction on "time

words" (e.g., temporal conjunctions) and genre stages influenced English learners' writing and

language development. Three focal, case study students' post-writing samples showed varying

degrees of SFL genre stages, SFL feature uptake, and longer text lengths. Additionally, their post-reading and English language proficiency scores increased.

Overall, Gebhard, Chen, and Britton's (2014) study is an example of a robust, exploratory case study of one teacher's use of SFL with native Spanish speakers. It emphasizes the utility of SFL for language development. However, the link between the teacher's use of SFL and students' meaning-making is not clear. The students' pre/post reading comprehension scores indicate growth, but the mechanism for this growth is unknown. Although the authors say that the longitudinal nature of the study allowed them to see changes in the teacher's practices, including her use of SFL over the year, this article focuses primarily on the analysis of the different texts and genres with which the SFL was applied and the students' growth over the year rather than the evolution of the teacher's practices. The teacher used SFL with her students for text analysis and co-deconstruction of genre stages, but this was used to support students' use of these stages in their own writing and not with the aim of supporting students' analysis of the text's content. Historically, SFL has most commonly been used as an instructional tool to support students' writing. Studies by Christie & Derewianka (2008) as well as the Gebhard et al. (2014) study reviewed above follow this tradition. In contrast, Schleppegrell (2013) and Moore & Schleppegrell (2014) from the Language and Meaning project reviewed above illustrate how an SFL-inspired metalanguage can also support students' analysis of text for the purpose of comprehension or meaning-making.

These studies suggest that a linguistic orientation to meaning-making can be realized as a discussion-based instructional approach focused on constructing understanding with the text. By highlighting particular linguistic features in texts, teachers can help English learners understand how language is organized to communicate ideas and enact relationships. SFL offers a

"functional grammar that connects language forms with meaning in contexts of use" (Schleppegrell, 2013, p. 155). As such, functional grammar can be a resource with which teachers and students make-meaning with text in the classroom.

Summary of empirical studies using an SFL-inspired metalanguage.

In the classroom context, metalanguage can be a tool with which teachers talk about the language in texts with students to make abstract aspects of reading (e.g., identifying themes, analyzing characters, explanations of scientific processes) more concrete for English learners. Because they are developing two languages, bilingual students have more awareness of language as a system and tend to outperform monolingual students on metalinguistic awareness tasks (Menyuk & Brisk, 2005). To capitalize on this strength, teachers need to explicitly teach English learners how to leverage their metalinguistic knowledge in support of comprehension. "One of the problems of less successful L2 readers is that they may not have the requisite metalinguistic knowledge or they are incapable of using this knowledge to support L2 comprehension" (Grabe, 2009, p. 132). Although the idea of a metalanguage is in itself a rather abstract notion, it has the potential to become a shared discourse (Tharp & Gallimore, 1988) among teachers and students in classrooms where talking about the language in, and meaning of, texts is common practice. As a shared discourse, using metalanguage to talk about texts can become a classroom norm, and in being familiar, metalanguage can come to be a shared resource for meaning-making.

Two dynamic processes—language learning and reading comprehension—coexist in the sociocultural context of the classroom. All learners, not just English learners, are constantly navigating and negotiating meaning-making in the classroom, and for all learners, this includes learning language, learning *through* language, and learning *about* language (Halliday, 1980/2004). "The development of reading comprehension is inseparable from the development

of language" (Tharp & Gallimore, 1988, p. 131). However, English learners are faced with the added challenge of learning a *new* language (Schleppegrell, 2010). If we, as a field, are going to move the needle on English learners' achievement in U.S. schools, teachers need to have tools and strategies with which they can assist English learners in successfully engaging with these complex processes.

Above, I discussed how a sociolinguistic theory of language development, a sociocultural theory of learning, and cognitive theories of reading comprehension can inform literacy instruction that supports English learners' language development and reading comprehension simultaneously. To investigate how a linguistic orientation to meaning-making translates to teaching in the classroom, I conducted a situated study of one teacher's enactment of a curriculum that featured functional grammar analysis for the purpose of supporting English learners' metalinguistic awareness and meaning-making with text.

A Situated Study of Practice

Taking all that has been reviewed and discussed above into consideration, it is evident that addressing both the literacy and language learning needs of English learners is a highly complex endeavor. Paired with instructional practices that have proven to be supportive of English learners' literacy development (e.g., text-based discussions), a linguistic orientation to reading comprehension instruction rooted in the theoretical principles of language learning and reading comprehension holds promise as a way for mainstream teachers to more effectively meet the needs of the English learners in their classrooms. To explore the validity and viability of this theory, including the affordances and limitations of such an instructional approach, the close study of a teacher's practice situated in the classroom enables a critical analysis of the theory instantiated via interactions among the teacher, the students and the curriculum.

In the act of teaching, an interaction among the teacher, the students, and the curriculum occurs. If we view teaching and learning as transformative and dynamic processes, this interaction among the teacher, the students, and the curriculum is the result of a complex system in which various components are working together "to produce an overall state or form at a particular point in time" (Larsen-Freeman & Cameron, 2008, p.26). But, as a complex system, it is also the case that classroom teaching and learning "interact with contextual factors as they *change* over time" (Larsen-Freeman & Cameron, 2008, p.34, emphasis added). Therefore, adopting the perspective of classroom teaching and learning as a complex system, the study of particular moments in time in a classroom is warranted, as well as the study of how the interactions among the teacher, the students, and the curriculum change over time. In the present study, I examine both: particular moments in time as revealed through classroom discourse, and how the teaching and learning in one classroom evolved over the course of a year as the result of interactions among the teacher, the curriculum, and the students.

Rather than a mere transmission of a written curriculum, the teacher's enactment of a curriculum is a dynamic part of this complex system. In the present study, the "enacted curriculum" refers to the ways in which the teacher brings the written curriculum to life through her instructional practices with students (Remillard, 2005). In instructional research, the term "practice" can be used and interpreted in a variety of ways (Lampert, 2010). A written lesson plan can suggest some of the essential ingredients for practice, but by its very nature of being written versus enacted, what is printed on the page remains inert until it is embodied and instantiated by a teacher. Variability is expected in an enacted curriculum; this variability in practice is the result of the interaction among the teacher, the teacher's preparation for teaching, her decision making, the students' learning needs and contributions, the text, and the curricular

materials (Remillard, 2005), all of which are context specific and part of a complex system (Larsen-Freeman & Cameron, 2008). If teachers' enactment of curricula can inform the development of written curricula, as it was intended to in the Language and Meaning project, there is a greater chance that written curricula can contribute to professional practice (Ball & Cohen, 1996). Also, on a broader scale, if instructional research can contribute to a better understanding of the relationships among the components in the complex system of reading comprehension instruction, then the knowledge generated by such research will be more valuable for those who are interested in how we can promote the advancement of English learners' literacy development in the elementary grades. As stated in the RAND report (2002):

> To maximize the possibility that research will yield *useable knowledge*, instructional research, regardless of the method employed, needs to attend to each of these elements [reader, text, activity, sociocultural context] of reading comprehension. Careful descriptions of both the texts used in the research and the specific context of instruction need to accompany careful descriptions of the participants. The context includes, but is not limited to (in the case of classroom-based research), general classroom conditions (reported in Pressley et al., 2001) that set the stage for effective instruction, the specific nature of the instructional activity or activities in which the learner is engaged, and the specific nature of the support that teachers, peers and instructional tools (e.g., computers) provide. (p. 30)

A close examination of one teacher's instructional practices enables us to see the craft of teaching in which the teacher, as a decision-maker, draws upon various resources (e.g., the curriculum, knowledge of her students, knowledge of learning, language, physical space, time, texts, student participation, and subject-specific content) to support students' construction of

meaning with text. A close study of one teacher's enactment of the Language and Meaning curriculum enables us to see the opportunities and challenges in taking a functional grammar approach to facilitating English learners' meaning-making in the context of text-based discussions in a fourth-grade classroom.

CHAPTER 3: THE METHODS

This dissertation is an embedded case study, specifically a "telling" case, of one fourth-grade teacher's enactment of the Language and Meaning curriculum in the last year of a three-year research project. A case study is "a detailed presentation of ethnographic data relating to some sequence of events from which the analyst seeks to make some theoretical inference. […] Each case study is a description of a specific configuration of events in which some distinctive set of actors have been involved in some defined situation at some particular point of time" (Mitchell, 1984, p. 237). This study qualifies as an embedded case study (Yin, 2014) because in it, I analyze four units of instruction, each of which presented a unique context shaped by the genre of the text and the overarching instructional goals particular to that unit. Therefore, each unit of instruction warranted its own analysis that considered the contextual factors influencing the unit. However, it is also true that these units were not separate or isolated instances of instruction. They were all part of a yearlong curriculum, designed by the Language and Meaning research team and enacted by the same fourth-grade teacher with the same group of students. These unifying factors also enabled the analysis of the curriculum as a whole, across the year, across genres and across modalities (i.e., reading, speaking and preparing to write).

A "Telling" Case

Specifically, this dissertation is one type of case study. It is best described as a "telling" case, "in which the particular circumstances surrounding a case, serve to make previously obscure theoretical relationships suddenly apparent" (Mitchell, 1984, p. 239). In the case presented here, several theoretical relationships are illuminated and made available for analysis.

Primarily, theories of language learning, reading comprehension, and the argument genre that underpinned the design of the Language and Meaning curriculum were translated into teacher-student, text-based discussions, which involved the text, the written curriculum, and Ms. Youssef's instruction. The particular circumstances that surrounded this case were the Language and Meaning research project (e.g., the professional development, the iterative design of the curriculum), the teacher, the students and the context of the classroom. Additionally, the factors of time, genre and modality were considered to be circumstances that defined this case.

Context and Participants

The school district and the school.

This case study was conducted in an urban school district that serves a predominantly Arabic-speaking community. In the schools, 90% of the students speak Arabic and a large portion of the teachers, administrators and staff do as well. The schools serve a student population of whom 90% qualify for free and reduced-cost lunch. The school in which this study was conducted was one of five schools that participated in the Language and Meaning project. Adjacent to a busy, urban thoroughfare, the school serves 585 students, approximately 82% of whom are designated by the school district as "LEP" (limited English proficient) and 89% of whom receive free and reduced-cost lunch.

The Language and Meaning project.

In the Language and Meaning project, the larger research project from which this dissertation grew, SFL informed the design of the language arts curriculum that was enacted by participating teachers. Particular SFL resources from the interpersonal, ideational, and textual metafunctions were translated into a *functional grammar metalanguage* to enable elementary classroom discussions about the language and meaning in texts. By focusing on the linguistic

features of texts, the Language and Meaning curriculum was designed to support a functional approach to the analysis of text. This approach was "functional" in the sense that it was focused on meaning-making; it was referred to as *functional grammar analysis*.

The Language and Meaning project was conceived of and directed by Mary Schleppegrell and Annemarie Palincsar with the help of graduate student research assistants, Jason Moore and Catherine O'Hallaron. In 2009, Schleppegrell and Palincsar wrote an Institute of Education Sciences grant proposal, which was awarded. It supported the iterative development of a three-year, design-based research project that consisted of a first year in one elementary school and a subsequent expansion in the following two years to include a total of 29 teachers and 14 literacy coaches in six elementary schools across the district (Schleppegrell & Palincsar, 2009). Located in an urban, public school district with a high percentage of English learners, the project's original research questions were: How can teachers better support English Language Learners' (ELLs) reading development, enabling them to read for deeper meaning, make inferences, and recognize the points of view that a text presents? What strategies can teachers use to help students extract and construct meaning from text?

The Language and Meaning project was designed to develop a curriculum that would address the Common Core State Standards for English Language Arts *and* encourage students' understanding and use of language in the context of reading and writing. The curriculum was designed to enable 2nd through 5th grade teachers' use of functional grammar analysis as a tool to engage students in analyzing characters in narrative fiction, writing character analyses, interpreting informational text, and constructing arguments with the use of text. Consistent with sociocultural learning theory, to promote oral language, the lessons were written for discussion-based instructional contexts in which the teacher and students worked together to read and

understand shared pieces of text.

The Language and Meaning research project spanned three years. The data for the study presented here were collected in the third year of the project. The third year featured four units of instruction—two of which were designed to support the reading and analysis of narrative fiction texts and two of which were designed to support the reading and analysis of informational science texts. Additionally, teaching students the metalanguage of argumentation was an integral part of the instruction in two of the units, Units 2 and 4. The Language and Meaning team facilitated professional development institutes prior to teachers' enactment of each unit. The enactment of these four units occurred across the academic year from October 2012 to May of 2013. This case study is the first to follow the yearlong evolution of the Language and Meaning curriculum enactment in one classroom.

The Language and Meaning curriculum and professional development.

This study investigates one fourth-grade teacher's enactment of four language arts units. Each unit consisted of lesson plans and supplemental materials (e.g., texts, hand-outs, graphic organizers, power point files, and for Unit 3, hands-on materials for building a simple circuit). All of the documents were provided in hard copy and digitally through the project's website (www.functionalgrammar.org). The lesson plans were intended to be a comprehensive guide to support sequential, meaningful literacy instruction with whole-class and small-group participation structures, as well as individual writing. Although the layout of the written lesson plans for each unit varied slightly as the result of the iterative design process, all the lessons suggested procedures and instructional dialogue with which to facilitate the analysis of text.

The supplemental materials were integral to the lesson plans; they provided visual and graphic representations of concepts central to each unit and scaffolds for student learning. In

Units 2 and 3, the materials also supported tactile, collaborative experiences. For example, when Ms. Youssef introduced the stages of a character analysis in Unit 2, she used a power point that explained each stage in tandem with two model texts, one that she posted on the wall and another that students, in groups of three, reconstructed.

With the exception of Unit 1, the Language and Meaning team wrote the texts for each unit. For Unit 2, since we were aiming to support teachers in their use of functional grammar as a tool for helping their students analyze characters, we wrote our own texts to ensure they had certain features. The texts needed to have multiple excerpts in which the author used *doing processes* to show the character's persona; they needed to be short so that students could easily build a coherent mental representation of the entire story and spend the majority of their time analyzing the characters rather than piecing together the plot; the stories needed to present a character-driven dilemma that could support analyses of characters based on evidence from the text; and the vocabulary and content needed to be accessible and engaging for the respective grade levels.

For Unit 3, we authored our own texts to ensure students could strategically apply functional grammar analysis to derive meaning while reading. In an attempt to simplify concepts, many elementary science texts either anthropomorphize scientific concepts or present the material in simplified ways that are not reflective of how science texts are written at the secondary level (Graesser, McNamara, & Kulikowich, 2011). We intentionally crafted texts with specific features (e.g., grammatical metaphor) more typical of secondary language arts and science texts (Christie & Derewianka, 2008). Without texts that are sufficiently complex, teachers cannot prepare students to navigate texts used in school in the later grades. The texts for Unit 3 were informed by research on life science, earth science, and physical science issues. For

Unit 4, the texts needed to be brief, but they also needed to provide a substantial amount of conceptual information (e.g., evidence) with which students could craft a well-reasoned argument. The specifics of each unit will be described in the following findings chapters.

In addition to designing the curriculum, the Language and Meaning team facilitated daylong professional development institutes for the participants. In the third year of the project, 18 teachers and 13 literacy coaches/resource teachers from 5 schools participated. The main purpose of each institute was to: 1) provide an opportunity to work with the functional grammar concepts embedded in the curriculum, and 2) thoroughly review the curriculum in grade-level specific groups. After each professional development institute, the teachers would implement the lessons in the curriculum, and the research team would observe the lessons, gather video and audio data, and take field notes using a semi-structured observation protocol. As an iterative, design-based research, the project also aimed to learn from the teachers by studying their enactment of the lessons and integrating the teachers' feedback into the overall design of the instructional materials and professional development institutes. Over the course of the year, there were five institutes; four were held prior to implementation of a new unit and one was held at the end of the year to gather post-assessment data on teachers' knowledge of functional grammar and to receive feedback on the fourth and final unit.

The teacher.

This study focuses on one of the fourth-grade teachers from the Language and Meaning research project, Ms. Youssef (a self-selected pseudonym) and her 21 students (thirteen boys and eight girls) for whom English is a second language to their native Arabic. The year in which these data were gathered was Ms. Youssef's twelfth year teaching at the same public school.

Like her students, Ms. Youssef's native language is Arabic, and she considers herself to be an English language learner.

Ms. Youssef holds an undergraduate degree in English Literature from King Abdulaziz University in Saudi Arabia. Most of her teachers at King Abdulaziz University were British and American. Ms. Youssef received her teacher training from the American University in Beirut with a professor who earned her Ph.D. in the United States. After immigrating to the United States herself, Ms. Youssef received her Master's degree in English and a bilingual teaching endorsement from a research university located in a large city in the Midwest. She also furthered her professional development through participating in workshops hosted by the bilingual department in her school district (Ms. Youssef, personal communication, January 29, 2015). Prior to joining the Language and Meaning project in the third year of the project, in the 2006-2007 school year, Ms. Youssef had participated in several professional development workshops led by Mary Schleppegrell. These workshops, which were held at the school in which Ms. Youssef was teaching, introduced teachers to functional grammar analysis.

When Ms. Youssef joined the Language and Meaning project for the 2012-13 school year, she did so with a sense of conviction. On the first day of our first professional development institute, as I was handing out forms to be signed, she introduced herself and said, "You know, I've been working with functional grammar for some time now. Mary came to our school several years ago, and when I was asked if I wanted to join the project this year, I was certain I would do it because the focus on language is so powerful for our students." When observing her lessons, the thoughtfulness with which she planned and enacted her lessons was apparent. She appeared to understand not only the curriculum but also the sociolinguistic, meaning-making principles underpinning it. Her pedagogy was reflective of the expertise that develops from years of

teaching experience, including a depth of literacy content knowledge and a clear understanding of the purpose of comprehension instruction, which made her an ideal case study teacher.

In an interview with Ms. Youssef conducted a year after her enactment of the Language and Meaning Curriculum, I asked how she defines reading comprehension:

It's like a three-legged stool. Number one, success to reading comprehension relies on the teacher, the delivery. The planning and the delivery. Number two, choosing the appropriate selection that is going to help you as an instructor target what you want in your objectives. And number three, engagement. How am I going to engage the student in my delivery? Engagement can be short and sweet. I do like the turn around and talk to a smaller group. I do like for them to get up and participate. I do like assigning them a small chunk in the book and saying, go work on it and discuss. They love to discuss. (Ms. Youssef, personal communication, July 14, 2014)

Ms. Youssef views reading comprehension as a teacher-mediated process. By carefully selecting texts that support the learning goals and employing practices that encourage social, discussion-based meaning-making, students use language to interact with one another and the text. I also asked, in her opinion, what accounts for the difference between a good and poor reader in fourth grade:

The poor reader is the one who most of their energy is wasted decoding. If I am directing the lesson, comprehension is no issue because with my scaffolding and engaging them, they can comprehend what's going on, and bilingual students usually learn tools to help them. After they reach a certain level of reading, they develop tools to help them get the implicit or the overall meaning, figure out the big idea in order to survive and succeed and get the whole idea of the lesson. But when the reader is stuttering, by the time they

reach the end of one sentence, they forget what the sentence is about. So fluency, fluency

is a crucial and you have also some students who are fluent who read everything fast,

fast, and they read it correctly, but they don't pause to think about okay, who is involved,

and what is going on? The fast readers with no comprehension are easier to train and say,

slow down, let's look at it, let's dissect it. (Ms. Youssef, personal communication, July

14, 2014)

Ms. Youssef's response reiterates the importance of the teacher's role as a facilitator in

the comprehension process. She also alludes to cognitive theories of comprehension that explain

the construction of a mental model as dependent upon the reader's ability to decipher and store

important information from one sentence to the next, infer implicit meanings, and synthesize

main ideas (Kintsch, 1998; Van den Broek & Kremer, 2000). To be effective teachers of reading

comprehension, teachers need to draw upon a theoretical model of reading comprehension

(Kucan et al., 2011; Pearson & Fielding, 1991). These interview data suggest Ms. Youssef

understands the reading comprehension process as well as the important role of the teacher's

skillful scaffolding and mediation in reading comprehension instruction.

The students.

The students' levels of English proficiency in this fourth-grade class varied. Some

students self-reported using English as the primary language at home, whereas some students

who had just newly arrived to the United States at the beginning of this study spoke no English at

home or in the classroom. However, the majority of the students fell in the 3 to 4 range on the

English Language Proficiency Assessment (ELPA), which has a five-point scale, with "1"

indicating advanced proficiency and "5" indicating that the child cannot speak or understand

English (beyond a few concrete, high-frequency words). With respect to the students' reading

skills, the school uses the individually administered Developmental Reading Assessment, which assesses phonemic awareness, knowledge of the alphabetic principle, oral reading fluency, vocabulary, comprehension, and reading engagement. Scores are reported on a range from 1-80, with scores in the 40s considered proficient in fourth grade. End-of-year DRA scores for the students in Ms. Youssef's class ranged from 14-60, with a class average of 41.6 and a standard deviation of 12.05.

Data Sources and Data Collection

Video and audio records of 24 lessons were collected over the course of a school year from October 2012 to May 2013. One member of the research team recorded video and audio during each of these periods while she simultaneously took field notes using a semi-structured observation protocol to code for the presence of functional grammar metalanguage, and noted the participation structures. (I was in the classroom to collect data for two lessons in Unit 1, three lessons in Unit 2, one lesson in Unit 3, and one lesson in Unit 4). On several occasions, the literacy coach or the teacher herself recorded the instruction and a member of the research team watched the video and took observational notes at a later date.

The reflection logs were electronic, "Google Doc" surveys designed by the Language and Meaning team. Ms. Youssef completed all seven logs: two during the enactment of Unit 1 and one after; one midway through Unit 2 and one after; one after Unit 3; and one after Unit 4.

One interview with Ms. Youssef was used as a data source in this study. I conducted the interview on July 14, 2014. This interview took place in Ms. Youssef's home.

Data Analysis

In this dissertation, my unit of analysis was *an episode of meaning-making with text*. In the present study, meaning-making was regarded as a social, dialogic, flexible process that

occurs over time during which individual learners internalize understandings of texts (Vygotsky, 1978, Wertsch, 1979, Wilkinson & Son, 2011). I reviewed the videos in their entirety and, in the process, I identified episodes (Lemke, 1990) of meaning-making with text. An episode was defined by a discourse signal from the teacher or a student: clearly marked beginnings of whole lessons (e.g., stating objectives, reviewing previous material), observable changes in focus during instruction, and clearly marked endings of lessons (e.g., summarizing, returning to the day's objectives to see if they had been met). Observable changes in focus during instruction were marked by transitions from one text excerpt to another, transitions from one participation structure to another, or moments when Ms. Youssef directed her students' attention to a new or different aspect of the text or ideas being discussed. Each episode was numbered, titled and labeled with the date and time according to where it occurred in the video, and coded.

With the video data from Units 1 and 2, I transcribed every episode and engaged in open coding (Corbin & Strauss, 2008). I began by coding each *turn of talk.* A turn of talk was defined as either a teacher or student contribution, and the turns were grouped in teacher-student exchanges. For example, in the following conversation excerpt (Figure 4.5), there are eight turns of talk and four exchanges (1-2, 3-4, 5-6, 7-8), the first of which is initiated by the teacher. The class is discussing the character of Tomás from the story *Tomás and The Library Lady* (Mora, 1997).

Codes for teacher turn in exchanges	Teacher Talk	Student Talk	Codes for student turn in exchanges
elicits claim	1. T: Wonderful. (commenting on a previous student's response). Who can think of another trait, another thing that is showing? A different description?	2. S4: Careful, careless.	makes claim
elicits clarification	3. T: Careful? What	4. S4: Not careful,	attempts to repair

	do you mean?	care.	
confirms repair	5. T: Care. You are on the right track.	6. S4: And kind.	makes claim
elicits claim	7. T: OK, so you mean caring. Caring and kind. OK, so let's see how they acted. They acted in what way?	8. Ss: Helpful way	makes claim

Figure 3.1. An example of coded exchanges from Lesson 3.

After coding each turn in terms of the function of the teacher or student's talk, I coded each exchange. There were multiple exchanges within an episode. By analyzing the discourse in the exchanges, I was able to identify the overarching instructional purpose/s of each episode. The codes for exchanges attempted to characterize the kinds of thinking Ms. Youssef was eliciting (e.g., identification of a process, interpreting attitude, making a claim, reasoning). Then I coded each episode for its overall instructional characteristics.

In Unit 1, I used three primary episode codes: MM (meaning-making specific to analyzing character), LANG (explicit attention to language without the use of functional grammar), and FG (explicit attention to language with the use of implicit or explicit functional grammar metalanguage). Questions such as, "What's happening here? What did he *do*?" were considered to be an implicit use of functional grammar metalanguage (i.e., eliciting students' identification of *doing processes* without using that particular terminology). The FG code was further delineated into categories for specific FG features (PART, PROC, ATT).

In Unit 2, I expanded the coding to account for discussions shaped by the stages of a character analysis. I also added a vocabulary code to account for explicit vocabulary instruction. Unit 2 codes consisted of: MM (analyzing character), LANG/VOCAB (explicit instruction of vocab or attention to language without the use of functional grammar), ARGU (analyzing

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character with the metalanguage of the stages of an argument) and FG (explicit attention to language with the use of implicit or explicit functional grammar metalanguage).

With the video data in Units 3 and 4, I approached my initial analysis at the level of the episode. In Unit 3, I used four primary episode codes: vocabulary, genre, functional grammar and meaning-making. The vocabulary and genre codes remained general (VOCAB and GENRE) and served as a signal for instances of discourse that contained explicit teaching of vocabulary or an explicit reference to informational text. The functional grammar codes were derived from my initial stages of open coding in Units 1 and 2. These codes were used to identify the implicit or explicit presence of functional grammar metalanguage in the instructional discourse (e.g., PART, PROC, ATTITUDE). At this stage of analysis, I used a general code of meaning-making (MM) to identify episodes in which Ms. Youssef and the students were engaged in text-based discussions aimed at building conceptual understanding. In Unit 4, I continued to code episodes of meaning-making with text using the codes I had developed in Units 2 and 3. (For a complete glossary of codes, see the Codebook, Appendix B.)

In addition to coding the video episodes in all four units, I summarized each episode and noted the instructional practices the teacher used during the episode. Upon analyzing these practices, I noticed that they varied in grain size (e.g., discourse moves, instructional techniques, participation structures). This finding informed the way I operationalized the construct of *instructional practices* in this study: the observed ways in which the teacher used, modified and supplemented the *written curriculum* to transform it into an *enacted curriculum* (Remillard, 2005). Instructional practices are also the ways in which the teacher shaped the conditions for learning through her use of varying participation structures, instructional techniques and discourse moves.

I also developed questions and hypotheses in response to episodes. These notes served as markers that informed my findings and cross-cutting implications. Below, Figure 3.1 is an example of coding and notes taken during an analysis of an episode in Unit 3.

Time stamp	Episode Code	Episode summary	Instructional Practices	Questions	Hypothesis
31'37 – 34'36	ATT	She asks students to read the next three paragraphs in the text in their table groups and find attitude words.	The instructional practice here is to give students time to read the text on their own with a purpose/task to accomplish. The task in this case is to find attitude - FGA provides the metalanguage that is central to the purpose.	How does this analysis of attitude differ from an analysis of attitude in narrative fiction?	It is the analysis of the author's attitude rather than a character's attitude. In both genres, authors show attitude but in informational text, the attitude is attributed to the author unless the text is describing a person or thing that is embodying attitude as a result of personification.

Figure 3.2. An excerpt from the episode coding and notes in Unit 3 analysis.

This identification of practices, questions and hypotheses generation was followed by axial coding (Corbin & Strauss, 2008), looking for broad patterns and sorting the episodes into instructional categories that emerged (e.g., meaning-making with functional grammar, explicit attention to language with functional grammar, meaning-making without functional grammar, explicit attention to language without functional grammar, meaning-making within the stages of an argument). The frequency of episodes within each category was quantified, and these results will be discussed in the following chapters.

Subsequently, I reviewed all of the episodes in each unit to determine the presence of opportunities for meaning-making and challenges. Opportunities for meaning-making in this study were defined as chances for students to construct meanings of a text through discussions. In this study, the teacher often led whole group discussions; but discussions about text, and concepts presented in the texts, also occurred among students in pairs and small groups. Challenges were defined as potential obstacles to meaning-making. These included, but were not limited to, ways in which the written curriculum or professional development may not have provided sufficient support, instances in which Ms. Youssef's instruction may not have supported the construction of meaning, or moments in which students struggled to understand Ms. Youssef's instruction or the language in the text.

During the initial identification of episodes and in the summary notes of each episode, opportunities for meaning-making and challenges were noted. By returning to my research question and the definition of meaning-making as it pertained to each unit's goals, I was able to review the data and identify episodes of instruction that afforded opportunities and presented challenges. This review revealed that opportunities for meaning-making were not limited to the episodes coded as "meaning-making." Opportunities for meaning-making were also present in some episodes in which Ms. Youssef provided explicit attention to the language in the text. It was also true that opportunities for meaning-making did not always include the use of functional grammar. The same was true for challenges; they existed throughout the data and were not confined to one instructional category or another.

I used the episode codes, notes and categories to identify and transcribe key instructional moments in each unit that could speak to my research question: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her

specific instructional practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with text? With this question driving my analysis, I analyzed the discourse of key episodes to illustrate: 1) particular practices she used to during the enactment of the curriculum, 2) opportunities for meaning-making, and 3) challenges that arose throughout the unit.

To understand how, through her enactment, Ms. Youssef modified the written curriculum I engaged in a document analysis of the written lesson plans. I reread the written lesson plans for each unit, located each key episode within each unit, and compared and contrasted the written lesson plan with Ms. Youssef's enactment. This enabled me to speak to the differences between the written curriculum and the enacted curriculum. I also engaged in a document analysis of Ms. Youssef's reflection logs and interview to confirm or disconfirm the conclusions drawn from my analysis of the classroom video data.

Reliability Measures

With this study, I took several measures to ensure reliability. First, I developed a research question that enabled me to conduct a thorough analysis of the data. Given that I was a member of the Language and Meaning team and was heavily involved in the project during the year of data collection for the present study, the research question needed, as much as possible, to offset potential bias. My initial research question was, "How does functional grammar analysis serve as an instructional tool for meaning-making in text-based discussions with English learners in a 4th grade classroom, and does the tool use differ as a function of reading narrative fiction and informational science texts?" I realized that this question made an assumption: functional grammar analysis served as an instructional tool. Instead, a more objective study would investigate how the teacher used functional grammar analysis, including both the opportunities

and challenges that arose, in her enactment of a curriculum that was designed to support her use of functional grammar analysis in the context of literacy instruction. The revised, final research question that guided this study was, "What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific instructional practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with text, and how does this enactment differ as a function of reading narrative fiction and informational science texts?"

Secondly, I conducted a comprehensive analysis of the data sources used in this study. Rather than assuming meaning-making would occur in select lessons or episodes, I viewed the full data set of classroom video from which I selected instructional episodes of meaning-making with text. When developing codes for the video data, the initial major codes were co-constructed with another researcher on the Language and Meaning team, Annemarie Palincsar, who was very familiar with the context and data. In addition to the video data, I used Ms. Youssef's reflection logs and interview data to achieve triangulation of data sources.

Third, I engaged in member checking with Ms. Youssef. On July 14, 2014, a year after her enactment of the curriculum, I conducted a formal interview with Ms. Youssef. Prior to the interview, I sent my questions to her. She and I spoke at length about her pedagogy, her perspectives on reading comprehension, and her use of functional grammar analysis since the culmination of the project. Throughout this study, Ms. Youssef and I maintained ongoing email correspondence. She consistently welcomed follow-up questions and always provided answers to my questions via email.

Finally, I created an audit trail with this study. If other researchers want to follow the steps of this study, they can view the data sources in their entirety and trace the sequential, iterative process I used to arrive at my claims.

CHAPTER 4: UNIT 1 – INTERPRETING AND EVALUATING CHARACTERS IN NARRATIVE FICTION TEXT

Introduction

In this chapter, I present my study of Ms. Youssef's enactment of the first unit in the Language and Meaning 2012-2013 Curriculum. Unit 1 was designed to teach students how to examine the language in a story to learn about characters. In this study of Ms. Youssef's enactment of Unit 1, I sought to address the question: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific teaching practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with *narrative fiction* text?

The organization of the chapter is as follows: To begin, I reiterate the importance of studying how a teacher supports students' reading the narrative fiction genre in schools. This is followed by a brief description of my data sources and data collection for this particular unit of study and a description of the written curriculum for Unit 1. Then, I present the findings. I identify the instructional practices Ms. Youssef used to facilitate students' meaning-making with narrative fiction text. Subsequently, I provide illustrative examples of opportunities for meaning-making with functional grammar that arose as a result of Ms. Youssef's enactment of the Unit 1 curriculum. These examples highlight how functional grammar analysis supported the teacher in developing a patterned way of talking about text. In turn, a patterned way of talking about text made the process of interpretation and evaluation explicit for students. Additionally, I

discuss the challenges specific to functional grammar that were revealed in her enactment of Unit 1. I conclude with a summary of the findings and instructional implications.

The Value of Reading Narrative Fiction in the Elementary Grades

When authors write narrative fiction, they make use of story elements such as setting, characters, problems and resolutions to portray a slice of life. A story's ability to stir the human imagination is a powerful force. "This power enables readers to transform words-on-a-page into emotional experiences that function as mirrors and windows into our lives and the lives of others" (Galda, 1998, p. 1). In the Common Core State Standards, grade four standards for literature emphasize the need for students to be able to "describe in depth a character, setting or event in a story or drama, drawing on specific details in the text" (National Governors Association Center for Best Practices, 2010, p. 12). Fourth-grade students are expected to be able to "determine the meaning of words and phrases as they are used in a text" (National Governors Association Center for Best Practices, 2010, p.12). These standards also speak to the importance of teaching students how to explain the meaning of texts by referring to what the text explicitly says and drawing inferences regarding what is implied. In cognitive terms, the Common Core State Standards advocate for readers to go beyond the textbase; they advocate for the construction of a coherent mental representation of text that involves an integration of the text's elements and meaning (Kintsch, 1986; Van den Broek & Kremer, 2000). As this chapter will illustrate, all of these standards were reflected in the first unit of the written, and enacted, Language and Meaning curriculum.

Reading and knowing how to comprehend literature or, specific to this study, narrative fiction, is a skill that carries importance in and out of school. While Galda (1998) makes one claim, it is also the case that literature is read simply for enjoyment and aesthetic appreciation. In

school, when students read and respond in writing to narrative fiction, they do so with increasing sophistication as they progress through the grades. In their analysis of response genres across the school years, Christie and Derewianka (2008) found that, in the early elementary years, the predominant form of written response is a personal one in which readers express whether or not they liked a text and make some observations about it. In the later elementary and early middle school years, students are expected to respond through reviewing texts. Book reviews allow for a personal opinion regarding the text, but they require a greater degree of objectivity, as readers need to describe the text and judge it. In upper middle school and high school, readers are expected to write character analyses, which consist of interpreting and evaluating characters.

Informed by the tradition of using SFL to support students' literacy growth in Australian schools, Christie and Derewianka's (2008) conception of response genres, in particular character analysis, influenced the Language and Meaning research team's thinking about the design of Units 1 and 2. With Unit 1 of the Language and Meaning curriculum, teachers were given written lesson plans to support students' analytical thinking with narrative fiction text that is reflective of both the CCSS for reading literature and response genres most commonly found in secondary schools. The rationale behind this was the following: if English learners were given sufficient linguistic support while reading grade-level narrative texts, perhaps they could think about text in analytical, meaningful ways reflective of the kinds of thinking most valued in the discipline of English Language Arts. English learners are not often given opportunities in school to engage with texts using higher order thinking because there is a false assumption that they need to reach some basic threshold of English before being able to benefit from doing so (Goldenberg, 2011). The curriculum for English learners is often "dumbed down," despite

recognizing that this does not promote overall language learning, academic achievement, or engagement (Harklau, 1994).

If we want students to acquire the ability to think about texts in sophisticated ways, especially those students for whom English is not a first language, then we need to scaffold opportunities for them to engage with texts in meaningful ways. Teacher-student conversations can provide opportunities for English learners to bridge their native language resources with academic English during the meaning-making process (Gibbons, 2004). Sociocultural theory (Vygotsky, 1978; Wertsch, 1991) further supports the idea that reading text and talking about its meaning via discussions gives readers the opportunity to socially and verbally develop ways of thinking that eventually translate into a written response, such as a character analysis.

Data Collection: Unit 1

For this unit in the Language and Meaning curriculum, the research team selected four stories, a different one for each grade level from the school district's Houghton Mifflin anthologies. The accompanying curricular units were designed to help students read a story and analyze the language in the text specifically for the purpose of interpreting and evaluating the characters.

In September of 2012, a member of the research team piloted the curriculum for Unit 1. The pilot took place over the course of six days in a 3rd grade classroom in a school that was participating in the *Language and Meaning* project. The pilot concluded on September 18th. The materials for each grade level were revised in response to the pilot data, and the professional development institute designed to support teachers' implementation of Unit 1 was held on September 28th, 2012.

The following month, Ms. Youssef enacted the grade-four, Unit 1 curriculum. It consisted of ten lessons. The video data for this chapter were collected over the course of seven nonconsecutive days in October of 2012, between October 11th and October 23rd.

The data sources for this chapter consisted of: audio and video recordings of Lessons 3, 6, 7, 8 and 10; observational field notes; Ms. Youssef's three reflection logs (two of which were submitted during the enactment and one was submitted after completion of the unit); the July 2014 interview with Ms. Youssef.

The Written Curriculum: Unit 1

The curricular unit of instruction under investigation in this chapter was designed to: 1) introduce some of the main functional grammar metalanguage in the context of a story, and 2) establish a foundation for character analysis, which would be further developed as a written genre in Unit 2. The fourth-grade Unit 1 lessons were based on Pat Mora's, *Tomás and The Library Lady* (1997), a story of Tomás, the son of migrant farm workers. At the beginning of the story, Tomás is sad and uncomfortable as his family travels north for migrant work. However, Tomás loves to listen to his grandfather's stories; the stories take his mind off the family's hardships. Tomás's grandfather encourages him to go the library to discover more stories. Although fearful at first, Tomás goes to the library where the librarian befriends him, and he falls in love with reading. Tomás then becomes the family's storyteller.

Unit 1 focused on four functional grammar features: *processes*, *attitude*, *polarity* and *force*. From the ideational metafunction, the lessons emphasized *processes*, or what's happening in the text. Every clause has a process. There are four types of processes: *doing*, *saying*, *sensing*, and *being*. *Doing processes* are actions (e.g., walked, carried). *Saying processes* are words that tell us someone said something (e.g., said, hollered, mumbled). *Sensing processes* tell us what a

character thinks or feels (e.g., I never feared thunder again.). *Being processes* are words that describe or define what someone or something *is* or *has* (e.g., He has brown eyes. She is scared.). In the written curriculum, the metalanguage of *process* was introduced in Lesson 6, and it was defined as one of the "meaningful chunks" of language in a sentence: "the happenings; the center of a sentence." "Meaningful chunks" are phrases that, in order to be meaningful, need to be recognized in their whole. In the Language and Meaning curriculum, identifying "meaningful chunks" was intended to help students recognize all the words that belong together to make the meaning in the functional roles of *process*, *participant*, and *circumstance* (M. Schleppegrell, personal communication, May 30, 2015). The term "meaningful chunk" was explicitly introduced to students in Lesson 6. The four processes types were introduced in Lesson 7.

Identifying the process in a clause can help readers understand, for example, what a character is doing, saying or sensing or how the character is being described by the author. Authors use sensing or being processes to directly describe characters' attitudes. Authors use doing or saying processes to indirectly describe characters, and with such indirect characterization, readers need to make inferences to understand the character's attitude or persona. For example, in the following text excerpt the author used doing processes (underlined below) to illustrate the character's attitude: "Tomás walked around and around the big building. He saw children coming out carrying books. Slowly, he started climbing up, up the steps" (Mora, 1997). The author does not explicitly state how the character, Tomás, was feeling. But because Tomás walked around and around the big building, saw children coming out carrying books, and began to slowly climb up the steps, the reader can infer Tomás was feeling curious but hesitant.

From the interpersonal metafunction, *attitude* was introduced in Lesson 4. Attitude in functional grammar refers to the language resources in which affect (i.e., feelings) and judgments

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(i.e., opinions) are presented. In this curriculum focused on character analysis, attitude referred to a character's thoughts or feelings. In the Unit 1 lesson plans, students were often asked to identify the *polarity* of a character's attitude (i.e., to characterize it on a linear array from positive to negative). To make the concept of polarity accessible to children, a heuristic of an attitude 'line' (like a number line) was used to visually represent the spectrum of positivity and negativity (see Figure 4.1).
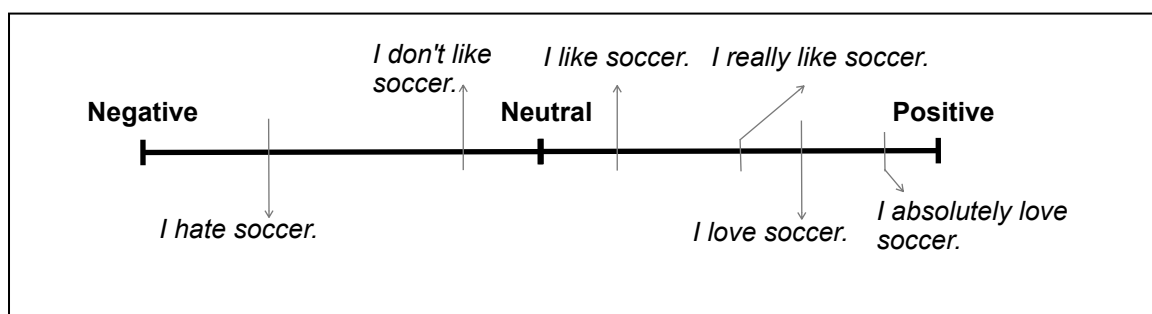
Figure 4.1. The attitude line. (Moore & Schleppegrell, 2014).

The feature of *force* (amplifying or softening the intensity of the attitude) was also framed in kid-friendly terms as *turning up* and *turning down* to indicate the intensity of the attitude. Used as a metalinguistic tool, these functional grammar features—*processes*, *attitude*, *polarity* and *force*—were intended to encourage readers to discuss characters' actions, dialogue, thoughts and feelings with a specific, nuanced vocabulary to support a more nuanced understanding of characters. The table below depicts all of the functional grammar metalanguage incorporated into the Unit 1 written curriculum for grade four.

Metalanguage	Lesson introduced	Purpose
Characteristics	2	Help students gain awareness about how authors present characters' traits through their actions, dialogue, and attitudes.
Direct/indirect characterization	3	Recognize how an author communicates a character's personality
Attitudes: Positive/negative	4	Focus on the words that communicate the attitudes – the actions or dialogue that show

Turned up Actions, dialogue		characters' attitudes.
Turned-down attitudes	5	Recognize when attitudes are turned down
Meaningful chunk: processes	6	Attitudes are often presented in chunks of words that go together: recognizing processes
4 types of processes	7	Identifying when processes present attitudes
Doing process: show and tell	8	Using processes to make inferences about character's attitudes by learning how actions communicate attitudes
Saying processes, Sayer, Message	9	Identifying attitude in dialogue and recognizing the meaningful chunks in which attitude is presented

Figure 4.2. Functional grammar metalanguage in Unit 1, Grade 4 (Schleppegrell, 2014).

In the lesson plans, teachers were asked to help their students understand how Tomás's character was revealed through what he did (actions), what he said (dialogue) and how he thought or felt (attitudes). The Unit 1 written curriculum provided a three-column organizer with which teachers could organize and display the thinking generated during discussions about the text (see Figure 4.3).

Words from story: *Character actions, dialogue, attitudes*	*Do these words show feeling or opinion? What emotion?*	*What do these words show about what kind of person he/she is?*

Figure 4.3. The template for the three-column organizer.

Intended to be a "conversation guide," the column headers on the organizer served as a scaffold for the kinds of questions that would elicit students' analyses of the main character. The "key" for the organizer, which was included in the materials for Unit 1, identified particular text excerpts for analysis and provided answers to the questions in the headers. If necessary, teachers could use the answers in the guide to support their own analysis of the text (i.e., to understand

the thinking of the curriculum developers) as well as to guide their students in their analysis of characters (see Figure 4.4). (For the complete "key" that was provided in the curricular materials, see Unit 1: Main Organizer Key in Appendix A).

Words from story: Character actions, dialogue, attitudes	Do these words show feeling or opinion? What emotion?	What do these words show about what kind of person he is?
Example (pg. 162) Early the next morning Mamá and Papá went out to pick corn in the green fields. All day they worked in the hot sun. Tomás and Enrique carried water to them.	Does not show emotion but still tells us about Tomás	He is a caring person because he brings water to his thirsty family members.

Figure 4.4. An excerpt from the three-column organizer key.

In addition to the three-column organizer, each lesson plan included a series of questions (very similar to those in the graphic organizer) that teachers could use to help students analyze the "meaningful chunk" in a selected text excerpt:

Does this show something about the character?

What does it show about the character? (Evaluate)

How do I know? (Elaborate)

Questions such as these were scripted into the instructional dialogue in the lesson plans. (For the unit outline, see Appendix A. To view the complete curriculum, go to functionalgrammar.org and follow the links to Unit 1, 4th grade.)

Findings

As defined by the written curriculum, teaching for meaning-making with narrative fiction text consisted of using text-based discussions, informed by functional grammar, to support the co-construction of character analysis. Character analysis, in the Language and Meaning

curriculum, consisted of interpreting characters' attitudes and evaluating characters' personae. Although there were brief written assessment exercises at the end of each lesson (see GR4_Unit1_ActivityBooklet.docx at www.fucntionalgrammar.org), the majority of this meaning-making was expected to occur through whole-class discussions. The functional grammar analysis embedded in the lessons was intended to help students identify meaningful linguistic features, (e.g., *processes*, "meaningful chunks") from which they could interpret characters' *attitudes* and/or evaluate characters' personae.

In classroom video data of Unit 1, there were a total of 30 text-based instructional episodes across seven lessons. Out of the 30 text-based instructional episodes in Unit 1, Ms. Youssef used functional grammar metalanguage to support her students' meaning-making in 28 episodes. In 16 episodes, functional grammar was used as a tool to support students' character analysis (e.g., implicit or explicit language of *processes* was used to help students identify the meaningful chunk and infer characters' attitudes). In 12 episodes, Ms. Youssef used functional grammar to bring explicit attention to the language in the text (e.g., identifying processes, developing knowledge of processes types).

In just 2 of the 30 text-based instructional episodes in Unit 1 did Ms. Youssef support her students' meaning-making *without* using functional grammar. In one of these episodes, she asked students how Tomás's feelings had changed over the course of the story. This question elicited analysis from the students but not with the assistance of either implicit or explicit functional grammar metalanguage. In the other episode, she and the students revisited the sentence, "He [Tomás] liked being the teacher," and Ms. Youssef asked the students to determine whether the author was showing or telling something about the character. This episode was focused on the author's craft, not on understanding more about Tomás.

Table 4.1 *Unit 1 Instructional Categories and Episodes*

Unit 1	
Instructional Categories	**Number of occurrences**
With FG	
Analyzing character using functional grammar metalanguage	16
Explicit attention to language using functional grammar	12
Without FG	
Analyzing character without using functional grammar	1
Explicit instruction of vocabulary, genre, or attention to language (e.g., show and tell) without the use of functional grammar	1

Table 4.1 above shows the distribution of episodes as they were organized into categories based on the focus of instruction at the level of an instructional episode and Ms. Youssef's use of functional grammar analysis during the episode. Throughout these episodes, her enactment of the curriculum revealed the practices she used to support meaning-making and the opportunities and challenges she encountered. In the next section of this chapter, I will discuss the key instructional practices revealed in her enactment of Unit 1. Subsequently, I will use key episodes to illustrate opportunities for meaning-making with text: instances in which whole-class discussions informed by functional grammar created opportunities for students to learn how to interpret characters' attitudes and evaluate characters based on their actions, speech and attitudes. Finally, I will discuss the challenges Ms. Youssef encountered in taking this approach to supporting student meaning-making with the text, *Tomás and The Library Lady* (Mora, 1997).

Instructional Practices

With the assumption that the teacher's instructional practices are a reflection of her decision making process, I operationalize *instructional practices* as the observable ways in

which the teacher used, modified and supplemented the *written curriculum* to transform it into an *enacted curriculum* (Remillard, 2005). Instructional practices are also the ways in which the teacher shaped the conditions for learning through her use of varying *participation structures* (e.g., whole-class, pair share, small-group work), *instructional techniques* (e.g., functional grammar analysis, systematic inquiry, shared reading, role play, think-aloud, explicit instruction, modeling, iterative readings of text, interactive read aloud, embedded vocabulary instruction, connecting hands-on experiences with text) and *discourse moves* (e.g., questioning, elicitations, recasting, revoicing, extending, translating instruction into students' native language). In observing and analyzing Ms. Youssef's instruction, it became evident that these practices were of a different grain size and often nested within one another. She made discourse moves (the most micro of all these practices), which were nested within discussions that often were shaped by particular instructional techniques that she used deliberately and flexibly. Discourse moves and instructional techniques were situated within participation structures that provided a format for the elicitation and exchange of ideas and supported students' engagement with the content, the text, each other and their teacher.

In each unit, Ms. Youssef's enacted curriculum revealed different salient practices that emerged as a result of the intersection among her pedagogy, the text, the learning goals for the unit, and her students. In Unit 1, my analysis of Ms. Youssef's instructional practices revealed 1) the affordances of a whole-class participation structure, particularly for English learners, 2) the centrality of a patterned line of inquiry, an instructional technique I refer to as a progression of analysis, and 3) the way in which she modified and supplemented the curriculum to accommodate her students' needs while attending to the learning goals. In this section, I will describe these salient instructional practices.

The affordances of a whole-class participation structure.

Throughout Unit 1, Ms. Youssef used whole-class, text-based discussions to scaffold the process of character analysis for her students. The lesson plans were written for a whole-class discussion format, and during her enactment she primarily used a whole-class participation structure, but I was unsure how this aligned with her typical approach to language arts instruction. In my July 2014 interview with Ms. Youssef, I asked how the structure of the functional grammar lessons compared with how she usually taught language arts and how the whole-class structure served her students, all of whom were English learners and several of whom were "newcomers" (i.e., students who had recently arrived from countries in the Arab world). Ms. Youssef replied by explaining the constraints under which she has to make decisions about her literacy instruction.

In the district in which Ms. Youssef teaches, a literacy program entitled "Daily Five" or "Café" had been mandated (Boushey & Moser, 2014). This instructional framework requires that students work in small groups and rotate through a series of choice-based reading activities for 90 minutes; in theory, the teacher works with needs-based, small groups of students for 20 minutes at a time. Ms. Youssef confessed that she does not adhere strictly to the Daily Five framework because she feels that her students are better served through a combination of whole-class lessons and intensive small group work. She responded by saying:

> Most of the time, my literacy block is functional grammar. I spend about 20 minutes, and I give them a choice of Daily Five, and I take the newcomers with me during those 20 minutes because the newcomers need a lot of [instructional] time. Being seen by an interventionist pull-out for half an hour throughout the day is not enough. They need *hours* of direct instruction. I work with them for 20 minutes, and I allocate throughout the

day 10 minutes here, 10 minutes there, […] English language learners need directions. Again, to leave them on their own without direction doesn't work. And to say, well you are seeing them in smaller groups, that's true, but within the 90 minutes, how often I can touch on that group? I may, I may not. So there are two or three groups that are going to be left out throughout the days. (Ms. Youssef, personal communication, July 14, 2014)

This justification for primarily employing a whole-class participation structure for text-based discussions informed by functional grammar (which she has continued to use on her own well beyond the timeline of the Language and Meaning project) has been validated in research that has shown how challenging it is for one teacher to provide a sufficient amount of support to English learners when they are working in small groups (Klingelhofer, 2014).

In Unit 1, with whole-class discussions, Ms. Youssef ensured that every student received multiple, supported opportunities to read the text. In Lesson 1, they read the text together in its entirety. In subsequent lessons, she guided her students in revisiting particular text excerpts for the purpose of interpreting the characters' attitudes and evaluating their personae. Focused whole-class instruction on smaller amounts of text supports students in efficiently applying their attentional resources, which is necessary for comprehension (Van den Broek & Kremer, 2000). Through choral reading and repeated readings, students heard and read the text together, which supported students' familiarity with the language and reading fluency (Rasinski, 2010). As a result of her providing a patterned framework for analysis, all of her students were asked causal questions (Van den Broek & Kremer, 2000) that were aimed at supporting their ability to connect the character's actions with inferences about the character's attitude or personae. High levels of thinking about text were not reserved for the students who were more proficient with English; *all* of her students were supported in engaging with the text in critical ways. However, one criticism

of Ms. Youssef's instruction and/or the structure of the lessons in this unit could be that they promoted an IRE (Initiation-Response-Evaluation) format in which the teacher holds interpretive authority and students' contributions are limited and judged by the teacher (Chinn et al., 2001). When this topic emerged in our interview, Ms. Youssef responded by saying:

> The evaluation part in the IRE is not necessarily teacher directed because sometimes in my interaction with them, my interaction will dictate an evaluation such as, 'Right now children I would like you to write a reflection. Open your journals and write a reflection. What do you think, why do you think Sarah was mad at her friend, in your opinion? It is in the selection, feel free to go back and see.' Now that's not whole group, in my opinion that's not whole group, okay? 'Let's sit in the gathering area. Who would like to read out loud their response? Who would like to critique?' I am a mediator here, just like a debate, I am a facilitator. (Ms. Youssef, personal communication, July 14, 2014)

Depending on the students and the learning goals, IRE or IRF (Initiation-Response-Follow-up) discussion formats can be beneficial (Boyd & Rubin, 2006; Burbules & Bruce, 2001). However, the sole practice of employing a participation structure does not dictate the aspects of interpretive authority or the quality of student contributions of most concern to critics of discourse patterns that discourage opportunities for students' interpretations and elaborations upon a text. This dialogic dynamic rests even more upon the ways in which a teacher's discourse moves influence the structure of the discussion, an instructional practice to which I turn next.

A patterned line of inquiry supported specific discourse moves.

During the text-based discussions in Unit 1, Ms. Youssef employed a patterned line of inquiry—a progression of analysis—as an instructional technique that reinforced a predictable way to approach thinking about text for the purpose of analyzing characters. She always began

with a choral reading of the excerpt followed by identifying the *process* and interpreting what this process showed about Tomás's character. As specified in the lesson plans, she concluded each progression of analysis by asking the students to justify their evaluations.

This progression of analysis supported the asking of specific kinds of questions (e.g., What is happening here? Does this character's action show attitude? What attitude does it show? What does this tell you about the character?). The written lesson plans specified which text excerpts to analyze, and each text excerpt was paired with a series of questions teachers could ask to support students' analysis. In the lesson plans, the series of questions varied slightly depending on the text excerpt under discussion and the goals of the lesson. However, Ms. Youssef's questions rarely varied. Although her questions were specific to each text excerpt under discussion and very similar to the ones specified in the lesson plans, she often reworded or eliminated some so that the progression of questions was less idiosyncratic and more predictable. The ways in which this instructional technique and its accompanying discourse moves supported students' meaning-making will be discussed below in the opportunities section.

Modifying the curricular materials to accommodate students.

Ms. Youssef also used the three-column organizer (Figure 4.3) provided in the curriculum as a conversation guide. With the help of this organizer, she led her students through analyzing specific text excerpts. This analysis consisted of 1) determining whether or not the character's action showed an attitude, 2) if an attitude was shown, interpreting the attitude, and 3) using this interpretation to evaluate the character. The text excerpts for analysis were specified in both the lesson plans and the three-column organizer key to support the teacher in focusing on parts of the text that would yield the richest character analysis. By hanging a large version of this organizer on the blackboard in the classroom, Ms. Youssef documented students' thinking and

made their thinking visible so that it could be used as a resource and reference throughout the unit.

Although the three-column organizer remained on the wall throughout this unit, she used it flexibly. When she recognized that it was easier for her students to consider what an action showed about Tomás's personality without the preceding step of interpreting his attitude, she decided to omit the step that asked students to determine whether or not the action showed an attitude and if so, what attitude. The tasks of determining whether or not an action showed attitude and interpreting the attitude seemed to be getting in the way of her students' ability to evaluate Tomás. With this unit, the purpose was to introduce students to character analysis, and Ms. Youssef's decision to modify the three-column organizer demonstrates how she consistently modified her instruction in response to the development she was observing in her students; when she saw that an element of the lesson plan was not serving her goals and the students' needs, she shifted it in ways that made the instruction more responsive to their needs. This modification of the three-column organizer is a good example of how Ms. Youssef's enacted curriculum was the result of assessing her students' needs and understanding the overall learning goals for the unit.

Supplementing the curriculum to reinforce learning.

In addition to modifying the materials to ensure that they supported her students' ability to interpret characters' attitudes and evaluate their personae, Ms. Youssef supplemented the curriculum with other resources. Between Lessons 7 and 8, she used two additional resources to help her students grasp a few core functional grammar concepts. First, she used text excerpts from *Grandfather's Journey* (Say, 1993) to reinforce students' understanding of the four process types and the difference between when an author "shows" versus "tells" the reader about a character. This text was new to her students. In her reflection log, she mentioned that there

should be more opportunities for students to practice working with the functional grammar metalanguage with new texts to increase engagement (Youssef, Unit 1, reflection log 2). After working on analyzing text excerpts in *Grandfather's Journey,* she returned to a text excerpt from *Tomás and the Library Lady* (Mora, 1997) with which the students had already attempted to identify various process types. As they continued to struggle with learning the process types, Ms. Youssef decided to, once again, minimize the *amount* of material students were learning (all four process types) and focus on mastering the understanding of the doing processes. To do so, she drew upon another resource external to the written curriculum: a brief video of a pantomime frying an egg in a pan.

She showed the video of the pantomime twice. Before the second viewing, Ms. Youssef instructed the students to write down everything the pantomime was *doing* in the video. Then she collected students' ideas about the pantomime's actions. After the pantomime video, she returned to an excerpt from *Tomás and the Library Lady* that the students had not yet analyzed. Most of the students who contributed to the discussion were able to identify the *doing processes* in the text excerpt with ease. Then Ms. Youssef asked her students to determine whether or not these actions showed feelings and what these actions showed about Tomás's personality.

Ms. Youssef drew upon multiple media, external to the written curriculum and materials, to provide additional opportunities for her students to understand the process types, in particular, doing processes. With text excerpts from *Grandfather's Journey*, Ms. Youssef isolated three aspects of character analysis that she and the students had been working on: identifying the processes, identifying the process types, and inferring what processes show about the character. With the pantomime video, she asked students to identify the pantomime's actions (i.e., the doing processes). After using both of these supplements to the curriculum, she returned to an

excerpt from *Tomás and the Library Lady* so that students had an opportunity to apply this work with doing processes to the text that was central to the unit.

Summary of instructional practices.

Ms. Youssef's enactment of Unit 1 revealed three key instructional practices: a whole-class participation structure, a patterned line of inquiry that supported specific types of questions, and the modification and supplementation of the written curriculum. Her practices reflected how she was responsive to the goals of the Language and Meaning curriculum and the learning needs of her students. Ms. Youssef's instructional practices and the students' contributions enabled the presence of meaning-making opportunities. I turn to these findings next.

Opportunities for Meaning-Making with Functional Grammar

Opportunities for meaning-making in Unit 1 consisted of instances in which whole-class discussions, informed by functional grammar, created opportunities for students to learn how to interpret characters' attitudes and evaluate characters based on their actions, speech and attitudes. In this section, I will explain how the progression of analysis provided a structure for talking about the language and meaning in text. Through the analysis of an illustrative example of a progression of analysis, I will delineate the various opportunities for meaning-making that occurred within this overarching structure. I will also explain how the heuristic of the attitude line served as a tool for unpacking word meaning and students' thinking. An illustrative episode will show how a focus on both the implicit and explicit meanings in the text enabled Ms. Youssef and her students to toggle back and forth between word meaning and constructing an evaluation of the main character, Tomás.

A progression of analysis provided a structure for talking about the language and meaning in text.

In Lesson 1 of Unit 1, the plan suggested that prior to reading the story, teachers make the purpose of reading narrative fiction explicit to students up front:

> We read stories for fun but also to learn lessons. Authors present characters to entertain us but also teach us. We're going to focus on characters and how authors create them. Authors present characters in many different ways. They often describe what they look like on the outside. But even more importantly, they give us information about what they're like on the inside: their *characteristics* or *traits*. That's what we're going to focus on.

Then, the plan recommended that teachers read the story in its entirety prior to closely examining selected text excerpts, addressing any unknown vocabulary during the read aloud. In Lesson 2, the lesson plan explained how authors often use "indirect characterization" to show the reader a character's personality traits through his or her actions, dialogue and attitudes (Moore & Schleppegrell, 2014). An example was provided for students to practice identifying a character's actions and using this action to interpret the character's attitude.

In Lesson 3, Ms. Youssef and her students returned to *Tomás and The Library Lady* (Mora, 1997) to analyze the characters in the story. As suggested in the lesson plans, Ms. Youssef made a large version of the three-column organizer (Figure 4.3) on butcher paper. Initially blank, she hung it on the chalkboard, and as she and the students progressed through the unit, she filled the rows and columns with notes from their discussions. Below was the first text excerpt discussed.

> Early the next morning Mamá and Papá went out to pick corn in the green fields. All day they worked in the hot sun. Tomás and Enrique carried water to them.

The plan for Lesson 3 suggested the teacher ask the following questions:

What is the action done by Tomás (and Enrique)? (identify the process)

What does it show about his personality? (evaluate)

Why do you think that? (elaborate)

As discussed above in the section on her instructional practices, Ms. Youssef employed a patterned, consistent approach to the analysis of text excerpts. Ms. Youssef led her students through this analytical process by breaking it down into five distinct steps: 1) a choral reading of the text passage being discussed; 2) identifying what's happening (i.e., the process) in the sentence; 3) inquiring about whether or not the *process* shows the character's attitude and if so, what attitude; 4) interpreting what this *process* shows about the character's persona; and, 5) justifying this evaluation with reasoning and elaboration. With steps two, three and four, Ms. Youssef engaged students in interpreting the character's personality traits; these steps focused students' attention on two functional grammar features, *processes* and *attitudes*, the understanding of which would be developed over the course of the unit.

Ms. Youssef slightly modified the series of questions suggested in the lesson plans to create opportunities for reading the text aloud. She added step one, the choral reading of the text, into the progression of analysis. The lesson plan did not specify how to present the text to the students, but as is evident in the data from all of the units, she consistently incorporated opportunities for students to read the text excerpts aloud with her; this builds students' fluency (Rasinski, 2010) and establishes a collective focus on the text.

Ms. Youssef was also consistent in her asking of causal questions. Step five, justifying an evaluation with reasoning and/or elaboration, was implied in the series of questions provided in the lesson plans, but it was not specified on the three-column organizer with which Ms. Youssef was recording the ideas generated during the discussions. This last step, which was reflected in

causal questions (Van den Broek & Kremer, 2000) such as, "Why do you think that?" and "How do you know?" proved to be an important discourse move in these discussions because these higher order questions encouraged students to reason with evidence from the text and/or general reasoning skills. Reasoning and explaining one's thinking about text requires articulating the connections between explicit and implicit information in the text and drawing upon background knowledge, both of which are key aspects of comprehension (Kintsch, 1986; Van den Broek & Kremer, 2000). Here is the progression of analysis that emerged in Ms. Youssef's enactment of Unit1:

Unit 1 Progression of Analysis

1. Choral reading of the text excerpt
2. Identify the character's action in the sentence
3. Determine if the action shows the character's attitude and if so, what attitude
4. Interpret what this action shows about the character
5. Justify evaluations with reasoning

Below is the first episode in which Ms. Youssef led her students, during a whole class discussion, through the progression of analysis outlined above. Each of the steps in the progression is indicated. In the transcription of episodes, I used traditional orthography (e.g., punctuation, spelling, capitalization) and several additional transcription conventions: All CAPITALS indicates a word that was emphasized in the speech; a forward slash "/" indicates multiple student responses that occurred in one turn; and brackets "[ ]" indicate overlapping speech. I also maintained the speakers' grammar, including any infelicities resulting from nonnative English discourse.

First attempt at analyzing actions to interpret characters
(Source: Unit 1, Lesson 3, 11:22 – 16:46,)

1. T: Let's start with the actions of the characters. The way the characters ACT or DO things. Let's look at this example. Together.

2. STEP 1➔T & Ss: "Early the next morning Mamá and Papá went out to pick corn in the green fields. All day they worked in the hot sun. Tomás and Enrique carried water to them."

3. T: You are going to help me THINK about the characters and what they were doing. Before I ask the question, read the sentence again to yourselves.

4. (Students read silently.)

5. STEP 2➔T: OK. Now tell me, what is the action, what is the doing in this story by Tomás and Enrique. Raise your hand. What is the action? (She translates this question into Arabic.) And we are starting by saying Tomás. It's right here. Think about it. I'm talking about the doing. What did they DO? What were their ACTIONS? Yes sir.

In the exchanges above, Ms. Youssef used the questions, "What did they DO? What were their ACTIONS?" to focus students' attention on the *processes* in the excerpt. In this way, the functional grammar metalanguage is implicit rather than explicit. This was reflective of the lesson plan.

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6. S1: Tomás and Enrique carried water to them.

7. T: Thank you. So words from the story, or actions, the things they did. What did they DO?

8. Ss: Carried water. (Ms. Youssef writes these words on the three-column organizer.)

9. STEP 3➔T: Now children, when you carry water, (acting it out) I'm carrying water, does it show feelings, how I feel?

10. Ss: Yes/No

11. S2: Sometimes when you're tired and hot.

12. T: OK, then you must be looking at me, you are using your eyes right? But I want you to use only the words the author gave you. So THEY carried water to their parents, does it show how I feel?

13. Ss: No

14. T: My opinion, my ATTITUDE?

15. Ss: No

16. S3: Opinion.

In the exchanges above, the challenge of determining whether or not an action shows attitude is revealed. This will be discussed in the section below on the challenges Ms. Youssef encountered during enactment. Her move to redirect students' attention away from the expression on her face and back to the text may not have been enough support (at this point in the unit) for students to understand the difference between actions that show attitude and those that do not.

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17. T: Omar

18. S4: Tomás —

19. T: Tomás —(speaks to Omar in Arabic)

20. S4: —reads books

21. T: He reads books, yes. Yes, Fatima.

22. S5: He carried water?

23. Step 4➔T: It doesn't show an opinion or any feelings but it's ok, ok? But what does it SHOW about what kind of PERSON is Tomás or Enrique? (translates into Arabic) Tomás and Enrique carried water to them. What does it SHOW me about what kind of people they are, what kind of a person they are? Hassan.

24. S6: Tomás and En Enrique—

25. T: and Enrique

26. S6: —Enrique are kind and helpful.

27. T: Why are you saying that?

28. Step 5➔S6: Because they're helping eh, eh, eh Mama and Papa.

At this point in the discussion, she had completed the first progression of analysis with the students. S6 was able to interpret the characters' personalities, based on their actions (i.e., processes) in the text excerpt.

29. Step 4➔T: Wonderful. Who can tell me another thing that shows what kind of person they are other than helpful. A DIFFERENT description. Salma.

30. S7: Careful, careless.

31. T: Careful? What do you mean?

32. S7: Not careful, care.

33. T: Care. You are on the right track.

34. S7: And and kind.

35. T: OK, so you mean caring. Caring and kind. Caring and kind. (She writes these words on the three-column organizer). OK, so let's see how they acted. They acted in what way?

36. Ss: Helpful

37. T: In a helpful way. They also acted in what way?

38. Ss: Caring and kind.

The exchanges above illustrate how these discussions about characters supported language learning as well as the content goal of analyzing characters.

39. T: In a caring way. In a kind way. Did the author say that in this statement here?

40. Ss: No.

41. Step 5➔T: How did you know? Then how did you come up with this? [. . .] Yes sir.

42. S8: Cause we read it and and we saw how people [acted.]

43. S9:   [it shows]

44. T: A:h.

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45. S8: It shows how are they doing, how a—

46. T: So the author probably showed you how they did it. OK.

> In these last few exchanges in the dialogue, Ms. Youssef pressed the students to explain their reasoning. S8 referred to the characters' actions as evidence for their interpretation and S9 referred to how authors "show" characters' traits through indirect characterization. S8's complete thought at line 45 may have provided more insight on his meaning-making process.

Opportunities for language-focused character analysis.

The episode above exemplifies the way in which Ms. Youssef approached discussions about the text using a patterned line of inquiry or *progression of analysis*. This progression of analysis provided an opportunity for focusing on a small portion of text for the purposes of closely examining language in the text at the level of a clause (Schleppegrell, 2013), discussing the implied meanings, and establishing causal relations (Van den Broek & Kremer, 2000). The choral reading established a collective focus on the text, and the subsequent opportunity to read the text excerpt again silently gave students another chance to look closely at the sentences under discussion. Because the instruction during a progression of analysis focused on one small portion of the overall text, and even smaller units of meaning within each clause, it eliminated the need for Ms. Youssef's students to decide where in the text to place their attention, which is another way whole-class, text-based discussions aid comprehension (Van den Broek & Kremer, 2000).

She then directed students' attention to the *process*, more specifically the words that communicated the characters' actions, but she did so without using the functional grammar metalanguage. The *process* and the *participants* (i.e., the people and things that participate in the process) form the essential "hub" of meaning in a clause. When readers examine what is 'going on' in a sentence, they focus their attention on the words and phrases that present the core

elemental meaning of that particular clause (Martin & Rose, 2007). In this episode above, Ms. Youssef directed students' attention to what Tomás and Enrique were *doing*, their action. S1 identified the process in the third sentence of this excerpt, which was "carried water." The focus on these words served as a foundation for Ms. Youssef's interpretive and evaluative questions about the characters.

In one progression of analysis focused on a small portion of text, Ms. Youssef provides the opportunity for students to build causal relations as they interpret and evaluate the character based on their actions and attitudes, but readers also need to be able to refer back to this information when working to comprehend other parts of the text. The construction of a coherent mental representation of text is incremental, which is why referential relations (keeping track of people, places and events in the text) are essential for comprehension. The three-column organizer that Ms. Youssef and her students started building in this episode above served as a representation of both referential and causal relations throughout the unit, and when Ms. Youssef referred to the thinking documented on the organizer, she was scaffolding students' construction of referential and causal relations.

Discourse moves in a progression of analysis.

The episode above illustrates Ms. Youssef's students' first attempt at analyzing characters in *Tomás and The Library Lady* (Mora, 1997). Ms. Youssef began by having her students read the text aloud together (line 2) and supporting her students to look closely at the text itself. She asked students to identify the action in the sentence (line 5). She used the concepts of 'action' and 'doing' interchangeably, and she rephrased the question six times in one turn of talk before expecting an answer. When the first student answered, he accurately identified the characters and their action in the excerpt (line 6).

She then engaged her students in a discussion about whether or not the action of carrying water showed an attitude. Some disagreement ensued. One source of confusion was Ms. Youssef's demonstration of carrying water (lines 9-12). When the students looked at her posture and the expression on her face, they inferred that she was feeling something (line 10 and 11). Ms. Youssef redirected her students to the words in the text "carried water," and clarified for her students that just the action of carrying water does not show an attitude (line 12).

She then supported her students in understanding that even though the action did not show an attitude, they could still evaluate Tomás as a person based on this action. Because the action of carrying water was contextualized in a story, the action had a meaning beyond the word level. She translated this evaluative question into Arabic (line 23). Several students made evaluations of characters' personae based on the text. Hassan, S6, claimed that Tomás and Enrique were kind and helpful (lines 24 - 26). Salma, S7, struggled to find the accurate morphological form for the word 'caring' and Ms. Youssef helped her find the word (lines 30-35).

Ms. Youssef also wanted her students to justify their evaluations with reasoning. This occurred twice in the episode. The first occurrence was in line 27 when she asked Hassan to explain why he was claiming that Tomás and Enrique were kind and helpful. Hassan reasoned about his evaluation by qualifying the characters' action: they were helping Mama and Papa (line 28). With the question of 'why are you saying that' (line 27), Ms. Youssef's elicitation for reasoning did not yield much elaboration from Hassan. He simply restated his evaluation. However, subsequent elicitations for reasoning encouraged the kinds of reasoning that support readers' metacognitive awareness as they articulate the connections between their inferences and the text.

After Salma had claimed that Tomás and Enrique were caring, Ms. Youssef asked students to explain *how* they knew Tomás and Enrique were caring people. In response, one student referred to what he, the student, did as a reader (line 42); he read the text and 'saw' how people acted. Another student spoke at the same time, referring to how the text 'shows' (line 43) and then the previous student elaborated on this idea (line 45).

The above explication of the discourse in a progression of analysis illustrates the micro moves Ms. Youssef made in one episode from a text-based discussion informed by functional grammar. The key discourse moves that supported the learning goals in the above episode were: 1) framing the functional grammar analysis (i.e., identifying the *process*) in kid-friendly terms, 2) the repetition and rephrasing of the question that elicited the student's identification of the *process*, 3) explicitly linking the action identified to the evaluative question "What does 'it' show me about what kind of people they are?", 4) translating the evaluative question into the students' native language, 5) asking students to justify their evaluations of the characters, 6) eliciting multiple opinions, and 7) listening and responding to students' contributions in ways that scaffolded language development and accuracy of meaning. Recall that, in the written lesson plan, the following discussion questions were suggested: *What is the action done by Tomás (and Enrique)? (identify the process) What does it show about his personality? (evaluate) Why do you think that? (elaborate).* It is evident that Ms. Youssef used these three questions and the three-column organizer as tools for guiding the trajectory of the discussion. Yet the meaning-making substance of the discussion occurred as a result of how she used both these questions and the student contributions to lead the class to an understanding of the connection between the words in the text that communicated the characters' action and the implied meanings.

It is important to note that Ms. Youssef's discourse moves were responsive to this particular class of students, all of whom are English learners, so the moves she made in this episode might be useful during reading comprehension instruction for all learners but particularly for English learners. It is also important to remember that this one episode was situated in a whole-class, text-based discussion so although not every student spoke, all the students had read the text and were experiencing this carefully orchestrated discussion, which would not have been the case if this discussion had occurred with a small group of students.

Implicit functional grammar.

In this progression outlined above, Ms. Youssef used the metalanguage of "actions" and "doing" to focus the students' attention on the characters' actions. The functional grammar metalanguage of *processes* was intentionally implicit at this point in the unit. Rather than explicitly teaching the functional grammar metalanguage upfront, the lesson plans foregrounded the characters' actions, dialogue, and attitudes. The instructional dialogue in the lesson plan specified analytical questions, which would help students interpret the characters' personas and justify their reasoning. Constructing these meanings took precedence over learning the functional grammar metalanguage. Without meaning-making as the central endeavor, functional grammar can become an exercise in identifying features (i.e., labeling parts of the sentence) rather than using an awareness of those features to better understand the text.

It wasn't until Lesson 6 that the FG term 'process' was explicitly introduced. Ms. Youssef introduced it as: "A process is what is happening. It's the steps, the action, the thinking, the feeling. Whatever is going on in the sentence, we call it a process. Process is the steps, the happening, the action, what is being said, what is being felt, all that" (Source: 7:28-8:19, Day 2, Lesson 6). But even after introducing this text feature explicitly, Ms. Youssef continued to use

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questions such as, "What is going on here? What is Tomás doing here?" to help her students identify the meaningful chunk in the sentence. In Unit 1, there was not a consistent presence of the term "process" in the classroom discourse, but this did not reduce the degree to which Ms. Youssef focused students' attention on the processes in a text excerpt. Nor did it imply that there were fewer opportunities for meaning-making. Interpreting characters' attitudes and evaluating the characters' personae were the goals of this unit. The functional grammar was meant to serve those goals, and Ms. Youssef used her knowledge of the functional grammar as an underpinning guide in discussions about the text's language and its meaning.

The attitude line and the *processes* supported attention to language and the construction of meaning.

To further support students' nuanced understanding of characters' attitudes (feelings and opinions), and to make the abstract idea of "attitude" more concrete, the curriculum included a heuristic referred to as *the attitude line* (Figure 4.1). Informed by the SFL *interpersonal metafunction* (Martin & Rose, 2007), the attitude line can represent how characters' attitudes presented in text have polarity (i.e., they range on a spectrum from positive to negative) and force (i.e., they vary in degrees of intensity).

Although we do not have a record of Ms. Youssef's enactment of the introduction of the attitude line in Unit 1, there were later episodes in which she referred to it. These episodes illustrate how she was integrating the attitude line into discussions about Tomás. In the following episode from Lesson 8, the class was discussing and analyzing the following text excerpt:

Tomás walked out of the library. Carrying his books, he ran home, eager to show the new stories to his family.

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For the sake of coherence and to illustrate how the dialogue begins and ends with a discussion about the word "eager," I have combined two episodes into one extended piece of transcript with explanations inserted. Ms. Youssef began the discussion in ways similar to the other instances in which she led students through the progression of analysis outlined above. She and the students read the text excerpt together, but before asking them to identify the doing processes, she paused at the word "eager" to ensure their understanding of this word.

Extended conversation about meaning of eager
(Source: Unit 1, Lesson 8, 48:21-50:36 and 0:00-4:44)

1. T: What does eager mean?

2. Ss: excitedly. happy, ecstatic

3. T: Happy happy very happy

4. S1: Ecstatic

5. T: Where is eager on the line of attitude?

6. Ss: Positive, positive.

7. T: How, how strong? Is it a turned up word or a turned down.

8. Ss: UP.

9. T: OK. "[...] eager to show the new stories to his family." I would like you to underline all the actions, the doing that Tomás is doing here. Underline the doings. (The 'doings' is Ms. Youssef's shorthand for *doing processes*. She gives students a minute to do so.) OK, who would like to share with me what you underlined. Kamil. What did he do?

10. S2: Walked.

11. T: Walked [out]—

12. S2:　　　　[out] of the library carrying books.

13. T: OK, walked out what else?

14. S2: He ran home to show his mom his books.

15. T: Ran home. What else?

16. S3: Carried books?

17. T: Carrying his books, ok. Is this—?

18. S3: He's doing it.

19. T: Yes he's doing that and yes, it's describing him. What else? Yes.

20. S4: He is eager to show his parents.

21. T: OK eager to show. Look at eager. In what process I would put eager? Look at the chart.

22. S4: Positive

23. T: I'm not talking about the attitude, <u>honey</u>. It is a positive attitude but I'm talking about the processes. Look at the processes chart. Where would eager be?

24. S4: Sensing[1]

Through the exchanges above, Ms. Youssef helped the students define the word "eager" and identify the doing processes and the sensing process in the text excerpt.

25. T: Sensing. It's a feeling, your right. OK. (She has them skip the second column on the graphic organizer about inferring attitude.) So what do these actions SHOW about him as a person. What can you infer? What can you figure out about him? When he is doing all this, what does this show you about him? (She circulates to confer with individual kids.) OK share with me. Let's add to our chart if we did not have it here already.

26. S5: Tomás likes books so much because—

27. T: Prove it.

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[1] In the sentence "He was eager to show…", the author has chosen to present Tomás' feelings in a *being* process. Grammatically this is not a sensing process, and in a further development of understanding of the meaning-grammar relationship this could be a point of discussion. In this case, the identification of this process as one that does indicate how a character feels leads the class to select "sensing" as the process type. I will continue to refer to this as a 'sensing' process here.

28. S5: Because he was so eager to show his family.

In this exchange above, the student made a judgment about Tomas's persona and used evidence from the text to defend her claim.

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29. T: Ah! He was so eager and with this one I can't help it I have to open that attitude line. Here. (She opens a large piece of butcher paper with the attitude line drawn on it.) When you are saying eager, on what side of the attitude line he is? On what side? (A student jumps out of his seat and points to the positive.)

30. S6: Positive.

31. T: On the positive side. OK if I have to look at happy or eager, where would eager be? Where would I put eager on the attitude line. Khalil, come show me.

32. (S7 gets up and points to the right side of neutral.)

33. T: Where would happy be?

34. (S7 points to the same place.)

35. T: Then where is eager?

36. S7: Eager *is* happy.

37. T: Eager is happy. Which—

38. S7: Eager is here (moving his hand over the line toward the positive).

39. T: Why eager is there?

40. S7: Because it's—

41. T: What's happening to the feeling?

42. S7: Turning up.

43. T: It's turning up. Wonderful. So back to your comment. What do you want me to write?

44. S5: Tomás loves books.

45. T: Tomás loves books very much. (She writes it on their classroom 3 -column organizer.)

Opportunities for using implicit and explicit information in the text to analyze character.

Meaning-making is not a linear process. As this extended episode illustrates, Ms. Youssef revisited and reiterated opportunities for meaning-making to support her students' understanding of implicit and explicit information in the text. In this episode, students had the opportunity to identify the processes. The run of student contributions indicates the relative ease with which students were able to identify doing processes and process types at this point in the unit. By connecting the identification of the processes to the question about what these processes show about Tomás's character, the functional grammar remained in service of the overall meaning-making goal: to evaluate a character's persona. The students also had the opportunity make an evaluation of the character's persona based on the information in the text (the character's actions and the author's direct characterization of Tomás). Although not specified in the lesson plan, Ms. Youssef used the attitude line to discuss the meaning of the word *eager*. Spending time on this word's meaning supported the building of students' descriptive vocabulary and created an opportunity for them to understand the nuance of Tomás's attitude at this point in the story.

Discourse moves in a discussion about a character's attitude and persona.

Ms. Youssef and her students discussed the meaning of "eager" at the beginning of this episode (lines 1-4). She used the metalanguage of *polarity* and *force* to elicit students' refinement of the word's meaning; she referred to the attitude line in the discussion, but she did not actually point to the line itself (lines 5–8). Then she elicited students' identification of the *doing processes* (lines 9-19). With a slight amount of prompting, S2 articulated the whole doing process, although Ms. Youssef recast it only partially (lines 10-13). When a student suggested that Tomás was eager to show his parents his books, Ms. Youssef used this as another

opportunity to reiterate the meaning of the word; this time she did so by asking the student to identify "eager" as a process type (lines 20-24), and with the help of the process type poster from the Language and Meaning materials, S4 was able to identify it as a sensing process. Then Ms. Youssef moved to eliciting judgments about Tomás's character (line 25).

When S5 claimed that Tomás liked books (line 26) and used the evidence that he was eager to show his family (line 28), Ms. Youssef returned to the discussion about the word "eager." This time, she unrolled the attitude line, which was written on a large piece of butcher paper, and asked the students to show where "eager" would be on the attitude line (lines 29-32). As she worked with S7 on plotting "eager" on the attitude line, it became evident that he thought eager was synonymous with happy. In response to Ms. Youssef's feedback, S7 eventually understood that eager was more 'turned-up' than happy (lines 33-43). When Ms. Youssef returned to S5 for her judgment about what these processes show about Tomás's character, S5 had turned-up her evaluation from "likes books so much" to "loves books" (lines 43–45). Ms. Youssef also included the "so much" from S5's first evaluation as she wrote it on the three-column organizer.

The close examination of the discourse in this episode with the attitude line reveals several key moves Ms. Youssef made to support her students' language development alongside their understanding of the character in the story. She began by eliciting definitions of the word *eager*, a word in the text excerpt that was central to the learning goal of understanding the character, Tomás. She facilitated a close reading of the text by directing students' attention to the doing processes. When a student suggested *eager* was a doing process, she used that as an opportunity to reteach the process types and clarify that *eager* was a sensing process. She asked students to determine what Tomás's actions showed about him as a person, and she provided

time for students to think about this on their own before answering. When a S5 offered an evaluation, she asked the student to "prove it." When the student justified her evaluation with the evidence that the text said Tomás was 'eager to show his family,' Ms. Youssef took this opportunity to reinforce and unpack the meaning of *eager* using the attitude line.

At the board, with the attitude line, she worked closely with one student to clarify his understanding of the word *eager* while the rest of the class watched and listened. She then returned to the overall goal of the analysis of the text excerpt, which was to formulate a evaluation about Tomás, and concluded by returning to S5's evaluation and writing it on the three-column organizer. In summary, Ms. Youssef knew that the word *eager* was central to students' understanding of this text excerpt. She elicited explicit definitions of *eager*, and she used the attitude line to help students understand how its meaning differed slightly from the word *happy*. Understanding what this text excerpt showed about Tomás was supported by the focus on the doing processes and understanding the meaning of *eager* was supported by the attitude line; both of these threads were woven together throughout this episode as Ms. Youssef and her students toggled between the two. Both of these understandings informed S5's evaluation about Tomás.

Modification of the progression of analysis.

Earlier in this lesson, prior to the episode above, Ms. Youssef told me that she and her students had been struggling with determining if a character's action shows *attitude* because her students had the tendency to "jump to" interpreting what the action showed about the character's *persona*. I confirmed that there are not always attitudes shown in an action. The plan for Lesson 8 had suggested discussing the attitudes shown in the *doing processes* in the text excerpt above, but Ms. Youssef deliberately skipped that step. From this point forward in the unit, she skipped

the question about whether or not the action showed an attitude and went straight to asking her

students what the processes showed about the character. Ms. Youssef's modified progression's

steps were as follows:

Original Progression of Analysis	Modified Progression of Analysis
1. Choral reading of the text excerpt 2. Identify the character's action in the sentence 3. Determine if the action shows the character's attitude and if so, what attitude 4. Interpret what this action shows about the character 5. Justify evaluations with reasoning	1. Choral reading of the text excerpt 2. Identify the character's action in the sentence 3. Interpret what this action shows about the character 4. Justify evaluations with reasoning

Although Ms. Youssef skipped the step about determining whether or not Tomás's

actions showed attitude (and if so, what attitude), much of the discussion in the episode above

centered on Tomás's attitude. The author provided an explicit description of Tomás's attitude in

this text excerpt; she described him as *eager*. S5 used this explicit description as evidence for her

evaluation (lines 26 and 28) when she was justifying her evaluation with reasoning, which is

precisely what readers can and should do as they make inferences about characters. If an author

explicitly states how a character is feeling or what a character is thinking, good readers know to

use that information to confirm their emerging interpretations and evaluations during the process

of constructing a coherent mental representation of the text (Tzeng et al., 2005). To analyze

characters, readers need to be able to use the character's actions and dialogue (i.e., indirect

characterization) to interpret the character's attitudes (Moore & Schleppegrell, 2014). The

pairing of the character's actions and dialogue with their implied attitudes serves as evidence to

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support evaluations about the character. Readers also need to attend to what is explicitly stated about the character (i.e., direct characterization). The fact that S5 used evidence explicitly stated in the text to support her evaluation is an example of how readers use what is explicitly stated to establish coherence.

In other words, to evaluate characters, readers refer to the attitudes that have been either explicitly or implicitly stated in the text. Ms. Youssef's decision to skip the step in which students determined whether or not the character's action or words showed attitude (and if so, what attitude) did not prevent the connection between evaluating characters and interpreting their attitudes. Her modification, which was in response to what seemed more natural for her students, simply reordered the sequence of this logic by foregrounding the evaluation followed by reasoning that required students to use the character's actions, dialogue, and attitudes as evidence to support their evaluations. As a result, there was still a focus on character's attitudes as was evident in the episode above.

Summary of opportunities for meaning-making with functional grammar.

Ms. Youssef created many opportunities for students to engage in meaning-making throughout this unit. To reiterate, meaning-making in this unit was defined as interpreting characters' attitudes and evaluating characters' personae (i.e., making claims about the character as a person). The functional grammar metalanguage was implicit throughout much of the unit; the term "processes" was not taught until Lesson 6 and even after that, Ms. Youssef would still ask students to first analyze a sentence by identifying "what's happening" or what the character is doing. However, this is not to say that the meta-language features remained underground throughout the whole unit. In Lessons 4 and 5, she explicitly introduced the attitude line and taught the metalinguistic terms (e.g., positive, negative, turned-up, turned-down) necessary for

using the attitude line in discussions about characters' attitudes. The episode above on "eager"

from Lesson 8 indicates how opportunities for meaning-making also included explicit and

meaningful usage of the metalanguage *processes* and *attitude*.

The progression of analysis delineated above, with four or five distinct steps depending

upon Ms. Youssef's modifications, occurred 16 times throughout the Unit 1 lessons; it provided

a framework with which Ms. Youssef and the students could approach character analysis in a

predictable, systematic way. As was evident in the episodes above, this progression provided

opportunities for the students to identify the processes in a text excerpt and use these processes

as a source for evaluating the character's personality. When attitudes were a point of discussion,

the attitude line provided a heuristic for a more a nuanced interpretation of the character's

attitudes.

Challenges with the Functional Grammar

Just as the practices and opportunities were specific to the Unit 1 learning goals and

instructional context, so were the challenges that arose during Ms. Youssef's enactment of this

unit. Some of these challenges have been alluded to in the previous sections; but in the following

section, I will discuss the challenges specific to the functional grammar metalanguage of

processes and the ways Ms. Youssef navigated these challenges.

Learning the metalanguage of processes: Identifying processes and process types.

In Unit 1, students were introduced to the metalanguage of processes and process types.

Although the metalinguistic term *process* was not explicitly introduced until Lesson 6, all of Ms.

Youssef's instruction was guided by a focus on processes, the concept of which was presented to

students implicitly as it was contextualized in the analysis of the text and framed in colloquial

terms such as, "What's happening here?" or "What is Tomás doing?" The four process types

were not introduced until Lesson 7. Prior to Lesson 7, the curriculum focused primarily on the *doing process*. Recall that a process is what is 'going on' or 'happening' in a sentence. When readers examine what is 'going on' in a sentence, they should focus their attention on more than just individual words. They should focus on the words and phrases that present the core elemental meaning of that particular clause (Martin & Rose, 2007).

Struggling with identifying the processes.

As a first step in the progression of analysis, after a choral reading of the text excerpt being analyzed, Ms. Youssef always elicited students' identification of the process by asking some variation of the questions, "What's going on here? What's happening?" Asking students, "Where is the doing process?" would not have made sense before students were actually introduced to this metalanguage, which did not occur until Lesson 6, and even after that, she continued to use the more implicit, colloquial phrases of, "What's going on?" or "What's happening?"

The students' initial difficulty with the identification of *processes* was most evident in their responses to Ms. Youssef's questions. In Lesson 3, Ms. Youssef led the students through analysis of three text excerpts. In every case, the first student to respond to her questions did not answer the question correctly; subsequent students did. The initial respondents identified the wrong speaker in the dialogue, or restated the whole sentence, or made some attempt to answer her question, but they did not identify the process in the sentence. By Lesson 6, Ms. Youssef was incorporating opportunities for students to turn and talk about the questions. Upon returning to the whole-class discussion after the turn-and-talk, the first respondent provided the whole meaningful chunk, including the process. Additionally, students identified the processes "saw" and "didn't see" and explained the difference.

Below, excerpts from the instructional discourse illustrate how Ms. Youssef's elicitations of the identification of processes evolved over the course of the unit:

Lesson	Ms. Youssef's ways of asking about the processes
Lesson 3	What is the action? What is the doing? What did they do? Who is doing the talking here? Who is doing the talking, the saying here? What is Tomás saying? What is the action? What is the doing? What did he do?
Lesson 6	What is the process in this sentence? My question is, what is the process that is done by Tomás? Where is the part that shows me the process?
Lesson 7	What is going on here, children? What is going on here? Is the author here telling us something or is the author showing us something? What kind of process I am talking about. Which words are guiding you to that doing action? Where is the talking here, where is the speaking? So what process I am using here? Sensing, feeling, thinking - where do you do the amazement? In what part of your body? What part makes you amazed? What part of your body? Is it your hand? Your leg? Which part of your body? So if Tomás walked around and around the big building what type of process is happening here? When you walk—what kind of—you are doing something so it's an action. Which word is showing another action? Which part showing another action? Which part is showing the doing, the action? Write down: What did the author or character show us?

	What he was doing? The main idea, what was he doing? What was the main idea? Was he sleeping? Was he climbing a mountain?
Lesson 8	Your task now, I would like you to underline, draw a line under the actions Tomás is doing. [she gives them time to do so] OK. Who is going to help me underline Tomás's actions? [She translates in Arabic.] Guide me. Guide me. Every hand should be up. Fatima, look up here and tell me which word I need to underline. "Tomás saw dinosaurs bending their long necks to lap shiny water." Where is the doing word? Where is the action?
Lesson 10	I would like you to underline all the actions, the doing that Tomás is doing here. Underline the doings. [She gives students a minute to do so.] OK, who would like to share with me what you underlined. Ibrahim. What did he do? "That night bumping along again in the tired old car Tomás held a shiny new book, a present from the library lady." Children, I'm asking you to focus on Tomás's actions. OK? Tomás's actions. Now you are on your own. I will not help at all. I would like you to reread, underline the actions of Tomás.

Figure 4.5. The evolution of Ms. Youssef's questions about doing processes.

By examining the evolution of the ways in which she asked students about the processes in the text excerpts, two patterns emerge that illustrate how Ms. Youssef responded to students' struggle with identifying the processes. The first pattern is how she moved from implicitly asking the students to identify the processes, to explicitly asking about the doing processes, and then back to implicitly asking about them. A possible explanation for this could be that students were struggling with the metalanguage of processes and process types (discussed more fully below), and Ms. Youssef chose to focus on meaning rather than mastering the metalanguage, a choice that reflected the spirit and intention of the curriculum. A second pattern is that of a gradual release of responsibility (Pearson & Gallagher, 1983) that becomes most evident in Lesson 6 when she began to incorporate opportunities for students to talk with a partner before sharing their thinking with the whole class, and in Lessons 8 and 10 when she asked students to identify the processes on their own before sharing out. Over the course of the unit, she provided varying degrees of scaffolding, depending on her assessment of their understanding, to enable their eventual independence with the identification of processes.

Struggling with identifying the process types.

In Lesson 7, the first student to reply to Ms. Youssef's questions continued to correctly identify the process, but in this same lesson, the students demonstrated some confusion about the process types (doing, saying, sensing, being). This was the point in the unit at which Ms. Youssef began to incorporate supplemental materials to reteach the process types and reteach the doing process in particular. Here is an episode from Lesson 7 that shows how students struggled to identify the process types.

The following text excerpt was used in the episode.

> He saw children coming out carrying books. Slowly he started climbing up, up the steps.

The process in the first sentence is "saw children coming out carrying books" and within that process, there are two more processes: "coming out carrying books" and "carrying books." So in that first sentence there is a main process, the process that Tomás is engaged in, the process of seeing ('saw'). In addition, there is a complex process in what Tomás saw, a process projected through his sensing, in which other actors, 'children', are 'coming out carrying books'; itself a process that could be analyzed as two doing processes. In the second sentence, the process is "slowly started climbing up, up the steps." Prior to the episode below, Ms. Youssef and the students had identified the processes as "climbing up and up" and "he saw kids coming out carrying books," which she accepted. These were sufficient answers. Students were identifying processes as meaningful chunks rather than just singular words. With the exception of the *sensing process* "saw," the rest of the processes are *doing processes*. Notice though, in the episode below, how difficult it is for the students to characterize the process types.

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Struggling to identify process types
(Source: Unit 1, L7, 17:34-19:48)

1. T & Ss: "He saw children coming out carrying books. Slowly he started climbing up, up the steps."

2. T: What kind of process going on here? Saw children, climbing the steps up, up? What kind of process going on here? Jafar?

3. S1: He's watching, he's looking at children.

4. T: What type of process is going on? Watching, look again and think about your answer. Kamil.

5. S2: He was thinking.

6. T: Thinking mm, ok, thinking about what?

7. S2: About the building, what's in it.

8. T: OK, where the part that shows you he's thinking?

9. S2: He was started, he slowly started climbing up, up the steps.

10. T: OK, I will accept that sometimes when you are slowly approaching, coming near something, probably you are thinking, you are hesitant, you're not sure, I will accept that. What else? What else is this showing me? He saw children coming out carrying book - what kind of process is going on here?

11. S3: He wants to, he like—

12. T: What kind of process going on here, honey?

13. S3: Thinking

14. T: OK other than thin—

15. S3: Feeling

16. T: OK other than thinking and feeling.

17. S3: He has—

18. T: Look at the words.

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19. S3: Action, action.

20. T: Why?

21. S3: Cause he's watching them.

22. T: He SAW. What else? Which word is showing another action? Which part showing another action? Yes ma'am. Amina.

23. S4: [inaudible]

24. T: Which part is showing the doing, the action?

25. S4: Coming to (struggling to see and decode) climbing

26. T: Climbing, he is climbing the steps.

Discourse moves in attempting to elicit process types.

In this episode, Ms. Youssef wanted the students to identify the types of processes in the text excerpt above. Despite the fact that she continually pointed to the poster of process types (doing, saying, sensing, being) hanging on the wall in the classroom and although she continued to rephrase her question, the students she called on struggled to identify the process types in this episode. She asked, "What kind of process going on here?" (line 2) and "What type of process is going on?" (line 4), but neither of those questions elicited process types from the students (lines 3 and 5). In response to S2's contribution (line 5), which was an inference about what Tomás was doing, Ms. Youssef pressed the student to elaborate (line 6). She asked S2 to return to the text to support his reasoning (line 8). S2 justified his inference with evidence in the text (line 9); although this was meaningful, S2's contribution did not address Ms. Youssef's question about process types. After validating S2's contribution, she again asked the students to identify the process types (lines 10 and 12). After several infelicitous responses, S3 suggested that the process type was "action" (line 19). She pressed S3 to justify his thinking (line 20). S3's

response indicated that he thought "watching" was an action (line 21). Ms. Youssef revoiced S3's response by saying "he SAW" (line 22). (Technically, seeing is a *sensing process*, not an action or *doing process*, but this distinction was not made clear in the lesson plans.) Rather than continuing to elicit the process types, Ms. Youssef used S3's response to elicit students' identification of another action or doing process (lines 22 and 24). S4 was able to accurately identify "climbing the steps" as a doing process.

Based on this episode, it appears the students did not grasp Ms. Youssef's questions about process types, and Ms. Youssef herself may have been confused about which process types the text was presenting. The students did not offer answers such as *sensing* or *doing*. It is also apparent that this discussion did not facilitate language learning or meaning-making. Trying to identify the process types did not lead to a deeper understanding of the language in this excerpt or the building of a more coherent mental model of the text. It seemed as if the students did not understand what Ms. Youssef was eliciting. Furthermore, the purpose for trying to elicit the identification of processes types was not clear in this episode.

Ms. Youssef recognized that her students were struggling with identifying the process types. She discussed this challenge in her reflection log:

Lesson 7 in particular was a dense one! It introduced the students to 4 processes at once. When I first taught the lesson I had to revisit the lesson plan frequently to grasp the processes that tell and the ones that show. The lesson did not go well at all. The following day, I played a pantomime clip from YouTube and focused on doing process more. I asked the students to describe what the character was doing; I told them, 'You are my eyes now. Show me what was the character doing.' It was pretty successful.

Then I briefly visited the other processes and I was constantly encouraging the students to refer to the poster for guidance. (Youssef, Unit 1, reflection log 3)

Ms. Youssef could have responded to her students' difficulty with this concept in a variety of ways. Rather than repeatedly drilling the identification of the four types of processes, she decided to help her students gain a deeper understanding of just one of the process types, the *doing process*, which was central to the task of interpreting indirect characterization in this unit. After the pantomime video, she returned to an excerpt from *Tomás and the Library Lady* that the students had not yet analyzed. Most of the students who contributed to the discussion were able to identify the *doing processes* in the text excerpt with ease. Then Ms. Youssef asked her students to determine whether or not these actions showed feelings and what these actions showed about Tomás's personality.

Summary of challenges.

In this unit of instruction, the metalanguage of processes presented a challenge for students. Although Ms. Youssef's students became more adept at identifying doing processes in text excerpts over the duration of the unit, they needed more support with understanding and identifying the four process types. As Ms. Youssef indicated in her reflection log and modifications to the curriculum, to really understand process types, students need more opportunities to work with applying this metalanguage to the analysis of text.

For the majority of the lessons in this unit, the focus on processes was implicit. For example, during episodes of text analysis, Ms. Youssef asked questions such as, "What's happening here?" that elicited students' identification of the process. The formal metalanguage of *processes* was not introduced until Lesson 6. When Lesson 7 came along and Ms. Youssef introduced all four process types (*doing*, *saying*, *sensing* and *being*) in one lesson, the lesson

proved to be difficult. The concept was challenging for students to grasp, and upon reflection, Ms. Youssef thought it would be more effective to devote a lesson to each process type.

Introducing processes and process types in the context of a story situated the focus on grammar in a meaningful context, but it may have also complicated the learning. In this unit of instruction, students were learning new metalanguage and trying to use that metalanguage in the context of analyzing characters. Although the rationale for this makes sense—to meaningfully situate the learning of the metalanguage within an authentic purpose for reading—it makes high demands on working memory because so much of the information is new (Sweller et al., 1998). Ms. Youssef, and the written curriculum, attempted to reduce the demands on working memory by not introducing the metalanguage explicitly until Lesson 6. Still, considering all of the new information students were working with in this unit (e.g., a new text, a new way of talking about text) and the added challenge of doing all of this work in English, the cognitive and linguistic demands were substantial. The overarching learning goal in this unit was to construct meaning with the text through closely and systematically analyzing the language in small excerpts of text to formulate interpretations and evaluations of the main character, Tomás. Ms. Youssef's navigation of the challenges revealed that she was responsive to both this curricular goal and her students' needs.

Conclusion

In this chapter, I presented my study of Ms. Youssef's enactment of the first unit in the Language and Meaning 2012-2013 Curriculum. I aimed to address the following question: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific teaching practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with *narrative fiction*

text? As the first unit in a yearlong curriculum consisting of four units, Unit 1 was designed to support teachers with 1) introducing some of the main functional grammar metalanguage in the context of a story, and 2) establishing a foundation for character analysis, which would be further developed as a written genre in Unit 2. The fourth-grade Unit 1 consisted of ten lessons and one text, *Tomás and The Library Lady (Mora, 1997)*. Audio and video recordings of five lessons (Lessons 3, 6, 7, 8 and 10), observational field notes, and Ms. Youssef's reflection logs were the data sources for this study. Discourse analysis and constant comparative methods were used to characterize and identify 1) the instructional practices Ms. Youssef used to support her students' meaning-making, 2) opportunities for meaning-making with functional grammar, and 3) challenges with functional grammar.

Instructional Practices

In this study, I operationalize instructional practices as the observable ways in which the teacher used, modified and supplemented the *written curriculum* to transform it into an *enacted curriculum* (Remillard, 2005). Instructional practices are also the ways in which the teacher shaped the conditions for learning through her use of varying *participation structures*, *instructional techniques*, and *discourse moves*. In Unit 1, my analysis of Ms. Youssef's instructional practices revealed 1) the affordances of a whole-class participation structure, particularly for English learners, 2) the centrality of a patterned line of inquiry, an instructional technique I refer to as a progression of analysis, and 3) the ways in which she modified and supplemented the curriculum to accommodate her students' needs while attending to the learning goals.

Opportunities for Meaning-Making with Functional Grammar

Opportunities for meaning-making in Unit 1 consisted of instances in which whole-class discussions, informed by functional grammar, created opportunities for students to learn how to interpret characters' attitudes and evaluate characters based on their actions, speech and attitudes. The patterned line of inquiry, or progression of analysis, Ms. Youssef employed scaffolded students' analysis of specific text excerpts. She always began with a choral reading of the excerpt followed by identifying the *process* and interpreting what this process showed about Tomás's character. As specified in the lesson plans, she concluded each progression of analysis by asking the students to justify their evaluations. This structure, which Ms. Youssef employed repeatedly throughout the unit, allowed for a close examination of the language in small excerpts of text for the larger purpose of understanding the main character in the story. Ms. Youssef carefully led her students through the analysis of each text excerpt with questions that facilitated attention to the language (Schleppegrell, 2013) and the establishment of causal relations (Van den Broek & Kremer, 2000), both of which are central to English learners' meaning-making with text.

Challenges with Functional Grammar

Ms. Youssef's enactment of Unit 1 also revealed challenges specific to the functional grammar. In particular, the metalanguage of *processes* and *process types* proved to be challenging for students. The written curriculum was designed to foreground the purpose of reading the story, which was to understand the text and analyze the character. The functional grammar remained implicit throughout the first five lessons in the unit. As a result of engaging in the professional development institute before her enactment of this unit and studying the curriculum, Ms. Youssef knew that the focus on the process underpinned the progression of analysis; she implicitly was asking students to identify the process when she asked questions

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such as, "What's happening here?" or "What is Tomás doing here?" With her scaffolding and rephrasing of these kinds of questions, students were often able identify what was 'going on' in a text excerpt. In Lesson 6, Ms. Youssef introduced the metalanguage of process but she quickly returned to asking about the process implicitly. In Lesson 7, she introduced the four process types (*doing*, *saying*, *sensing*, *being*). Recognizing that her students were not grasping this concept, she supplemented the curriculum and retaught the process types with a particular focus on the *doing process*, which was central to the analysis of indirect characterization (Moore & Schleppegrell, 2014).

Implications

This study of Ms. Youssef's enactment of Unit 1 and the text-based discussions that took place with her students, all of whom are English learners, illustrates how functional grammar analysis can inform an approach to reading comprehension instruction that provides a focus on the language during a collective process of meaning-making with text. With functional grammar analysis underpinning the curriculum, Ms. Youssef was able to scaffold whole-class, text-based discussions with a line of inquiry that continuously brought students' attention back to the language in the text and helped students make connections between the words in the text and their implied meanings. This process provided opportunities for English learners to use language and learn about language in the context of co-constructing meaning with text (Halliday, 1980/2004; Van den Broek & Kremer, 2000).

To employ an SFL-inspired functional grammar approach to reading comprehension instruction with English learners, teachers need to regard language as a meaning-making system. This applies to the language in written text as well as in spoken text, or discourse. Teachers' preparation for leading whole-class, text-based discussions informed by functional grammar

begins with analyzing instructional texts so that they know which text excerpts will yield the richest analysis. With narrative text, this involves paying particularly close attention to the ways in which the author uses indirect characterization (characters' actions and dialogue) to describe people (Moore & Schleppegrell, 2014). The metalanguage of *processes* provides an explicit name for the nucleus of meaning within a clause. Over time, this can be made explicit for students with the aim of it becoming part of the classroom shared discourse, but initially, teachers can direct students' attention to the processes implicitly through questions aimed at focusing students' attention on the "meaningful chunks" within a text excerpt. By focusing on characters' actions and dialogue, as well as attending to explicit descriptors, readers can interpret characters' attitudes and make evaluations about characters. Grounded in the language of the text, these interpretations and evaluations serve as evidence for claims about characters. Approaching the teaching of narrative text in this way in the elementary grades lays the groundwork for the kinds of reading, thinking, and writing students will be expected to do throughout their years in school (Christie & Derewianka, 2008; National Governors Association Center for Best Practices, 2010).

To lead students through the process of text-analysis in such a way that keeps the meaning-making foregrounded, teachers need to know the overall meaning-making purpose to identify select text excerpts for analysis. Then teachers can 1) follow a line of inquiry that begins with a close look at small sections of text, 2) focus students' attention on the core meanings expressed that reside at the level of the clause and 3) employ a logical sequence of questioning that incorporates causal questions supportive of students' construction of causal relations (Van den Broek & Kremer, 2000). Keeping track of students' thinking visibly, over the course of an instructional text-based unit, as was done in this unit with the three-column organizer, further

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supports the construction of referential relations (Van den Broek & Kremer, 2000). Although this discussion practice could be employed with small groups, this analysis has shown how a whole-class participation structure creates an opportunity for every student, regardless of English proficiency or background knowledge, to have access to the shared experience of reading the same text, looking closely at language, and using language to co-construct meaning (Vygotsky, 1978; Wells, 1994). Through carefully orchestrated scaffolding and responsiveness to students, teachers can weave opportunities for language learning and reading comprehension into a social, dialogic, text-based experience for all students, including English learners.

CHAPTER 5: UNIT 2 – THE DISCOURSE OF CHARACTER ANALYSIS

Introduction

In the previous findings chapter, I investigated the instructional practices, opportunities, and challenges that were revealed in Ms. Youssef's enactment of a curricular unit designed to support students' analyses of characters in narrative fiction. In this chapter, we will remain in the domain of narrative fiction as I explore the instructional practices, opportunities, and challenges that were revealed in Ms. Youssef's enactment of Unit 2, which was designed to support students in constructing a written character analysis based on their analyses of characters in a narrative fiction short story: *Best Friends* (Symons, 2012).

In some respects, Unit 2 was similar to Unit 1. Both units were designed to help students comprehend narrative fiction, and both units incorporated the functional grammar metalanguage of *processes* and *attitude* to help students analyze characters. However, Unit 2 built on the foundation laid in Unit 1 by introducing the structure of an argument, specifically, a character analysis, the metalanguage of argumentation (e.g., *claim*, *evidence*, *interpretation*, *evaluation*), and the task of writing a character analysis.

In this study of Ms. Youssef's enactment of Unit 2, I sought to address the same question I addressed in the previous findings chapter: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific instructional practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with narrative fiction text?

In this chapter, I explain the genre of character analysis and its role in reading instruction. Then I briefly describe the data sources and data collection for this unit of study, followed by a description of the written curriculum for Unit 2. Then, I present the findings. I identify the instructional practices Ms. Youssef used to facilitate the construction of a character analysis. Subsequently, I explain the opportunities for meaning-making that arose as a result of Ms. Youssef's enactment of the Unit 2 curriculum. Additionally, I discuss the challenges that were revealed in her enactment of Unit 2. Finally, I conclude with a summary of the findings and instructional implications.

The Argument Genre: Character Analysis

Character analysis requires students to interpret characters' attitudes, evaluate characters' personae, and justify reasoning with evidence from the text. These expectations are articulated in the Common Core State Standards for reading literature and for writing opinion pieces in fourth grade. Grade four standards for literature emphasize the need for students to be able to "describe in depth a character, setting or event in a story or drama, drawing on specific details in the text" (National Governors Association Center for Best Practices, 2010, p.12). In fourth grade, students are also expected to "write opinion pieces on topics or texts, supporting a point of view with reasons and information" (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). Fourth-grade students should be able to "introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose." They need to, "provide reasons that are supported by facts and details; link opinion and reasons using words and phrases; and provide a concluding statement or section related to the opinion presented" (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). These standards emphasize

the importance of 1) teaching students how to construct a specific type of meaning with text, 2) teaching students how to analyze a character, and 3) teaching the features and stages of an argument. In Unit 2, the curriculum was designed to help teachers support students in reading narrative text to construct a character analysis, and as a result, the teachers would address both reading and writing standards.

The Unit 2 curriculum was not only reflective of the standards; it was informed by a genre-based approach to teaching students how to respond to text in meaningful ways. In a genre-based approach, known as the "teaching/learning cycle" in the Sydney School work using SFL (Gebhard et al., 2014; Green & Lee, 1994; Martin, 2009), written texts serve several functions. First, there are the texts that students read as readers. In other words, they read these texts to understand a story, to build domain knowledge, or gather information about an issue. Then, model texts serve as examples of the target genre, which in this case was an argument, specifically a character analysis. In genre-based pedagogy, model texts are deconstructed to help students tease out the various stages and features of the genre. Teachers then co-construct texts with students to scaffold the process of writing a piece that is representative of the target genre. Then students construct texts—often first through discussion and then writing—which are both a representation of their meaning-making in response to the original text *and* a representation of the target genre.

In this unit, character analysis was the target genre. "In a character analysis, the writer explains how a character changed and why or evaluates a character's words or actions for a particular purpose" (Moore & Schleppegrell, 2014, p. 5). According to Christie & Derewianka (2008), a character analysis consists of three elements: character presentation in which the character is introduced, character description in which the author describes the character through

interpretive details, and character judgment with which the author offers a final evaluation of the character. As Christie and Derewianka (2008) illustrate, a character analysis requires a reader to interpret characters' actions and evaluate characters. This is more difficult than writing a personal response to text that requires the author to discuss what the book is about, or a book review that requires the author to comment on the strengths and weakness of a text. Constructing literary interpretation, such as a character analysis, is also more challenging than writing an argument that requires the writer to 'take a stand' on an issue. "Whereas writers of opinion pieces may draw on personal biases and real-world knowledge to construct their arguments, writers of literary analysis essays must base their reasoning on the much more challenging activity of formulating interpretations of literary texts" (Beck, 2006, pp. 416-417). Thus, reading a narrative fiction text for the purpose of constructing a character analysis is a complex task, especially for younger students who are learning English as a second language and need additional support for understanding the language in the texts they are reading.

Data Collection: Unit 2

For this unit in the Language and Meaning curriculum, I wrote four short stories, one for each grade level. The accompanying curricular units were designed to help students read a story and analyze the language in the text specifically for the purpose of interpreting and evaluating the characters.

Unit 2 in Year 2 of the Language and Meaning project had the same curricular goals as this unit in Year 3 so the research team drew upon video data, observation field notes, and the teacher and coach reflections as pilot data that informed the iterative redesign of Unit 2 in Year 3. The materials for each grade level were revised in response to the data from the previous year,

and the professional development institute that was designed to support teachers' implementation of Unit 2 was held on October 30 of 2012.

In December, Ms. Youssef enacted the grade-four, Unit 2 curriculum. It consisted of eight lessons. The video data for this chapter were collected over the course of four nonconsecutive days in December of 2012, between December 3rd and December 12th. One member of the research team recorded video and audio during each of these periods while she simultaneously took field notes. On one occasion, the teacher herself recorded the instruction and a member of the research team watched the video and took observation notes at a later date.

The data sources for this chapter consisted of: audio and video recordings of Lessons 3, 5, 6, and 7; observational field notes; and Ms. Youssef's reflection logs (one of which was submitted half way through the enactment and one was submitted after completion of the unit).

The Written Curriculum: Unit 2

Unit 2 was designed to help students 1) use functional grammar to analyze the characters, and 2) write a character analysis in response to reading the story. The fourth-grade lessons were based on an original story, *Best Friends* (Symons, 2012). In this story, three girls negotiate the issue of fidelity in friendship. At the beginning of the story, the main character, Sara, misses her best friend Kylie who went away with her family for summer vacation. Meanwhile, a new girl, Meg, moves in next door to Sara and they become great friends. When Kylie returns, she assumes her friendship with Sara will resume; but on the first day of school, it becomes apparent that Sara has made a new best friend. The story ends on an ambiguous note, which allows the reader to predict how the relationships among the three girls might unfold.

The curricular unit of instruction under investigation in this chapter continued to focus on the four functional grammar features introduced in Unit 1: *processes*, *attitude*, *polarity* and *force*.

The heuristic of the attitude line remained a central feature of the curriculum in Unit 2 (see Figure 5.1).
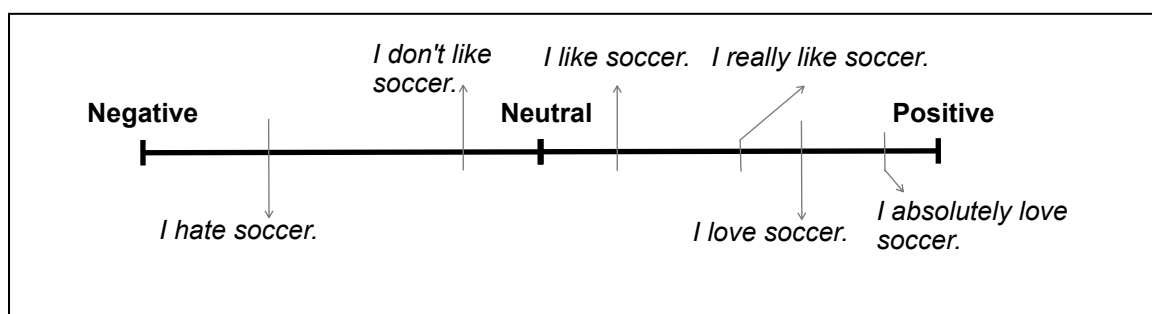
Figure 5.1. The attitude line (Moore & Schleppegrell, 2014).

In addition, the metalanguage for the stages of an argument, specifically a character analysis, was introduced in Unit 2 (see Figure 5.2). Drawing upon SFLs' definition of genre as a "staged, goal-oriented social process" (Martin, 2009; Martin & Rose, 2008), Toulmin's (2003) model of an argument (claim, evidence, and warrant), and Christie and Derewianka's (2008) schematic structure of a character analysis, as well as the project's previous work on the genre of *recount* (Schleppegrell et al., 2014), the Language and Meaning team developed a heuristic, or framework, with defined stages to support students in learning how to make a careful judgment about a character and provide details from the story to support and explain their thinking. There were five stages in the framework, each with its own function and content: 1) the *claim*, 2) the *orientation to evidence,* 3) *evidence,* 4) *interpretation,* and *5) evaluation*. These stages provided a structure for students' responses to the prompt: *Is Sara a good friend? Why or why not? Give evidence to support your ideas. (What does Sara do, say, think or feel to make you think that?)*.

Metalanguage	Lesson introduced	Purpose
Being, sensing, doing, saying Interpretation	1	review process types and show/tell. Practice interpreting shown attitudes by turning doing/saying into being/sensing.
Stages of a character analysis	5	To choose which evidence best supports their claim, and learn what it means to make an evaluation.

Figure 5.2. Functional grammar metalanguage in Unit 2, Grade 4 (Schleppegrell, 2014).

To scaffold the construction of a character analysis, the lesson plans provided the three-column organizer that was also used in Unit 1 (Figure 5.3). Ultimately, the steps outlined in the three-column organizer would serve as grist for students' written character analyses and this was the intention of the design (J. Moore, personal communication, October, 2012). The words from the text in column one could be used as textual evidence; the interpretations in column two could explain the attitudes implied in the evidence; and the evaluations in column three could explain how the evidence proves the claim. The lesson plans suggested making two three-column organizers: one for Kylie and one for Sara.

Using the three-column organizers to guide their whole class conversations, the first four lessons focused on reading the text and analyzing key excerpts for the purpose of analyzing both Kylie and Sara. The stages of a character analysis were introduced in Lesson 5. To make the stages of a character analysis explicit, the curriculum included a series of power point slides and an additional graphic organizer entitled "Digging Into Character Analysis" with which students would plan their own argument. (See Unit 2: *Character Analysis Graphic Organizer* in Appendix A.) In Lessons 6 and 7, the plans suggested that the teacher co-construct a model character analysis with the claim that "Sara is a mean friend," while each step of the way, students would construct their own character analysis using the "Digging into Character Analysis" graphic organizer. In Lesson 8, the students would transfer their rough draft plans from the graphic organizer to a final draft on blank notebook paper; the plan suggested having students reflect on how their opinions of Sara had changed over the course of analyzing the story. (For the complete text and unit outline, see Appendix A. To view the complete curriculum, go to functionalgrammar.org and follow the links to Unit 2, 4th grade.)

Words from story: Character actions, dialogue, attitudes	Do these words show feeling or opinion? If, so what emotion?	What do these words show about what kind of person she is? (Is she a good friend or not?)

Figure 5.3. The template for the three-column organizer.

Findings

As defined by the written curriculum, teaching for meaning-making with narrative fiction text consisted of using text-based discussions, informed by functional grammar, to support the co-construction of character analysis. The majority of this meaning-making was expected to occur through whole-class discussions, which would support students' construction of a written character analysis. The functional grammar analysis embedded in the lessons was intended to help students use the metalanguage of attitude, including polarity (positive/negative) and force (turn-up/turn-down), to discuss their interpretations and evaluations of the characters in the story. The metalanguage for the stages of an argument was integrated into the lessons to support students' understanding of the structure and purpose of a character analysis and scaffold the process of writing a character analysis.

In classroom video data of Unit 2, there were 30 text-based instructional episodes across four lessons. Out of the 30 text-based instructional episodes in Unit 2, Ms. Youssef used functional grammar metalanguage to support her students' meaning-making in 25 episodes. In six of these episodes, Ms. Youssef explicitly used the functional grammar metalanguage of *processes* and *attitude* in discussions aimed at analyzing the characters. In 15 episodes, she used the metalanguage of the stages of a character analysis to engage students in finding evidence to support their claims, developing orientations to their evidence that would provide the necessary background information for their reader, and constructing interpretations and evaluations of

characters in the story. This staged-structure served as a heuristic for whole-class discussions and as an organizational tool for students' individual writing of a character analysis. In four of these episodes, Ms. Youssef explicitly used the functional grammar metalanguage of *processes* or *attitudes* for the purpose of furthering students' understanding of these text features. In five episodes out of the 30 total, Ms. Youssef provided explicit attention to language without the use of functional grammar. In this unit, these instances consisted of explicit vocabulary instruction in which she taught words necessary for the analyses of the characters in *Best Friends* (Symons, 2012). (See Table 5.1).

Table 5.1 *Unit 2 Instructional Categories and Episodes*

Unit 2	
Instructional Categories	**Number of occurrences**
With FG	
Analyzing character using functional grammar metalanguage	6
Analyzing character with the metalanguage of argument stages	15
Explicit attention to language using functional grammar	4
Without FG	
Analyzing character without using functional grammar	0
Explicit instruction of vocabulary, genre or attention to language (e.g., show and tell) without the use of functional grammar	5

Table 5.1 above shows the distribution of episodes as they were organized into categories based on the focus of instruction at the level of an instructional episode and Ms. Youssef's use of functional grammar analysis during the episode. Throughout these episodes, her enactment of the curriculum revealed key instructional practices as well as opportunities and challenges specific to the functional grammar or argument metalanguage. In the next section, I will discuss the instructional practices she used in her enactment of the curriculum. Then I will use key episodes

to illustrate the opportunities for meaning-making: instances in which whole class discussions, informed by functional grammar, created opportunities for students to: 1) interpret characters' attitudes and personae, 2) evaluate characters based on their actions, speech and attitudes, and 3) construct an oral analysis, in preparation for writing, defined by sequential, logical stages. Finally, I will discuss the challenges specific to the presence or absence of metalanguage in Ms. Youssef's enactment of Unit 2.

Instructional Practices

As explained in Chapter 4, for this study instructional practices are defined as the observable ways in which the teacher used, modified and supplemented the *written curriculum* to transform it into an *enacted curriculum* (Remillard, 2005). Instructional practices are also the ways in which the teacher shaped the conditions for learning through her use of varying *participation structures, instructional techniques*, and *discourse moves*. In Ms. Youssef's enactment of Unit 2, two key instructional practices surfaced: her use of varied participation structures and the evolution of the functional grammar metalanguage. Below, I begin with a discussion of her use of varied participation structures and how these created opportunities for collective meaning-making and engagement with the text. Within the small-group participation structure, Ms. Youssef employed various instructional techniques that created multimodal learning opportunities. Then I discuss how the functional grammar metalanguage evolved throughout the unit. Ms. Youssef's instruction in Unit 2 exemplified deliberate use of the functional grammar metalanguage informed by the lesson plans as well as flexible, opportunistic use of the metalanguage informed by her students' needs.

Varied participation structures.

In Unit 2, Ms. Youssef employed varied participation structures including whole-group, small-group and pair work. Some of these were suggested in the lesson plans, and others were not. These varied participation structures enabled the students to interact with one another and the text through multiple modalities: reading, speaking, writing, role-play and hands-on experience.

Turn-and-talk.

In Lesson 3, Ms. Youssef engaged the students in the analysis of selected text excerpts. Similar to the discussions in Unit 1, this involved a patterned way of talking about the text, which included finding the process, interpreting the character's attitude and evaluating the character. The predictability and familiarity of this discourse structure, established by Ms. Youssef's consistent employment of the progression of analysis in Unit 1, allowed her students to begin doing more of the reasoning and thinking in pairs and small groups. In Unit 2, rather than leading the whole class through this entire process, Ms. Youssef incorporated pair work into these discussions. With the very first text excerpt, "On the first day of the new school year, Sara and Meg walked to school together laughing and talking the whole way there," she asked her students the question, "What is the process here? Talk to each other." The students, who were sitting at their desks, turned and talked to each other before she called on an individual student to provide the answer. The practice of "turn and talk" paired with functional grammar analysis gave students a chance to share their thinking about the text with one another, specifically their identification of the *process* and the *attitude* implied in the process. Giving students opportunities to talk with one another before sharing their ideas with the class during whole group discussions ensured that students had a chance to use language to talk about the text,

which supports both language development and reading comprehension (McKeown & Beck, 2006).

After determining that "walked to school" and "laughing and talking the whole way" were the processes and that these phrases showed a positive attitude, she asked the students to identify the attitude in "laughing and talking the whole way." She gave them the direction to discuss with one another. Once students began talking with one another, she spoke over them and added the question, "And what does it tell you about what kind of person she is? Be prepared to share." Students' discussions in response to these two questions lasted for 2 minutes. The ease with which students talked about these questions suggests that they were quite familiar with this line of questioning. With these text-dependent questions (Fisher & Frey, 2012) that require students to make inferences, students had opportunities to use these small group discussions to collaboratively generate higher order thinking about the text.

Role-play.

Later in Lesson 3, Ms. Youssef asked the students to analyze another text excerpt, "Sara stood there with her arms pinned to her side as she closed her eyes and braced herself against the force of Kylie's hug." As suggested in the lesson plan, she asked students to get into groups of three and role-play the scene of the three girls depicted in this text excerpt (Kylie hugging Sara with Meg looking on). The role-play gave students an opportunity to embody the action in the text, with one person acting out Sara who "stood there with her arms pinned to her side, closed her eyes and braced herself against the force of Kylie's hug," another person acting as Kylie forcefully hugging Sara, and a third person acting as Meg watching this whole scene. Through role-play, an instructional technique nested within the small group participation structure,

students had the opportunity to physically experience the characters' interaction as described in the text.

Understanding a character's action is the first step in the progression of analysis Ms. Youssef employed. Embodying a character's action provides another mode through which students can understand the text. To role-play a scene among characters from a story, students must understand what the text is saying (i.e., possess a mental representation of the textbase) (Kintsch, 1986) and draw upon their own background knowledge of similar situations, in this case, the action of hugging. From this foundation, through analyzing characters' actions and interpreting characters attitudes' based on their actions and dialogue, teachers can help students construct a situation model (Kintsch, 1986). An example of how a role-play can serve as an instructional anchor, or reference point, in the meaning-making process will be illustrated below in the challenges section.

Small-group, hands-on activity.

In Lesson 5, following the lesson plan closely, Ms. Youssef introduced the students to the stages of a character analysis. To do so, she used the power point slides in tandem with a written model of a character analysis of Kylie (posted on the wall) and a different model character analysis of Kylie, which was cut into sentence strips and placed inside an envelope. These two models each made and supported different claims. She assigned the students to groups of three and provided each group with an envelope of sentence strips. Ms. Youssef led the whole class through each stage of the character analysis, reading each slide and then asking the students, in their groups of three, to find the sentence that matched that description. This gave students a hands-on experience during which they could analyze a model text, stage by stage, and deliberate how a piece of text represented a stage in a character analysis. This guided small group work

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with the model text provided a visual and tactile experience that required students to talk about

the content and the structure of an argument using argumentation metalanguage.

Buddy reading.

At the beginning of Lesson 6, Ms. Youssef gave students the task of rereading the entire

text for the purpose of identifying Sara's actions and dialogue (i.e., *doing* and *saying processes*).

She modeled how to "buddy read" (elbow to elbow and knee to knee) and how to work with

another student to find Sara's actions and speech in the text. To preface this activity, she

explained the purpose:

T: Whom did we work about the past few days? We gave our opinion about whom?

Ss: Kylie.

T: About Kylie. This time we are going to dig deep into the following question: Is Sara a good friend. Why or why not. Provide evidence to support your ideas. Every time we have to answer a question about something, we have to refresh our memories by the information we have been reading. How do we do it? How do we refresh our memory about what we have been working on. What strategy?

Ss: Rereading.

T: What I would like you to do now, you are going to reread the story with your partner. But children when you are rereading the story, you are going to be thinking at the same time. I would like to model how we are going to reread the story with a friend. And when we are modeling the reading, when we are thinking, we are discussing at the same time. Now I am going to underline any process that Sara did. Anything that shows me or tells me something about Sara.

This buddy reading activity could be viewed as an isolated exercise of identifying of

functional grammar (i.e., *doing* and *saying process*), but it was not isolated because it was in

service of relocating Sara in the story. After reading two different model character analyses of

Kylie in the previous lesson, this buddy reading activity enabled students to refamiliarize

themselves with Sara's processes and reorient their analysis to Sara. Sara's actions and dialogue

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could also serve as evidence in their own arguments, which they were preparing to write later in this lesson.

The evolution of functional grammar metalanguage.

I characterize the use of functional grammar metalanguage as an instructional technique because it involves approaching the text and discussions about the text with a linguistic orientation (i.e., an awareness of how the language in the text encodes meaning). Yet Ms. Youssef's use of the functional grammar metalanguage also can be observed at the level of specific discourse moves. She used the functional grammar metalanguage according to the plans as well as opportunistically. In examining the chronology of the unit, Ms. Youssef's use of functional grammar evolved throughout the lessons from initially not using any functional grammar metalanguage (implicit or explicit) in the beginning of Lesson 3 when explicitly teaching vocabulary, to eventually using both the metalanguage of *processes* and the metalanguage of the stages of a character analysis in Lesson 7 to support students in the construction of a character analysis. This evolution observed in her enactment reflected the written curriculum.

In the beginning of Lesson 3, Ms. Youssef provided explicit attention to language, in particular, explicit instruction on emotional vocabulary or vocabulary necessary for the analysis of the characters in the story. (This vocabulary instruction was suggested in the lesson plan for Lesson 1.) In the latter half of Lesson 3, she transitioned to explicit use of functional grammar metalanguage to support the analyses of selected text excerpts. In these instances, similar to the discussions in Unit 1, Ms. Youssef and the students engaged in a progression of analysis that included identifying the *process*, interpreting the *attitude* and evaluating the character's persona. In Lesson 5, there was prevalent use of the metalanguage of the stages as she taught the stages of

a character analysis (e.g., claim, evidence, orientation to evidence). In Lesson 6, Ms. Youssef used the functional grammar metalanguage of *processes* and *attitudes* to help her students gather evidence about the character, Sara, in preparation to write a character analysis. Primarily, she used the three-column organizer *key,* provided in the curricular materials*,* to reinforce the relationship between the evidence in the text and the students' interpretations and evaluations of Sara's character. Ms. Youssef reinforced the relationship between the evidence and the students' interpretations through discussing possible evaluations (provided in the three-column organizer key) while students articulated their original interpretations and evaluations as well. Then, in Lesson 7, Ms. Youssef used the functional grammar metalanguage of *processes* and the metalanguage of argumentation to help students apply the whole class discussions to their individual development of an argument (i.e., a claim and a reason supported by evidence, an interpretation and an evaluation). Although these lessons only represent four of the eight lessons in Unit 2 curriculum, together their chronology illustrates the ways in which Ms. Youssef's use of the functional grammar metalanguage evolved and served varying purposes throughout the unit.

The written lesson plans provided the structure for this evolution, but *when* and *how* she used metalanguage was often opportunistic. For example, although the Unit 2 lesson plans did not specify identifying the process in the text, she always began discussions by having students identify the process. Toward the end of the unit, when students were struggling with constructing a reason in support of their claim, she interrupted their work to make a suggestion. "If you are struggling with the 'because' you know what might help you? Look at your evidence. Look at the doing word. Ask yourself, what is the character doing, what is the character saying."

To be opportunistic with functional grammar metalanguage, a teacher needs to understand the purpose functional grammar serves. In the example above, Ms. Youssef directed students' attention to the *doing process* in the context of writing a claim because it could help her students form the reason to support their claim. She suggested looking at what the character is "doing" or "saying" as a way to come up with a more general evaluation of the character. Ms. Youssef's direction built upon what she and her students had been working on throughout Units 1 and 2: identify the process and make an evaluation of the character based on their actions or words. With the one discourse move in which Ms. Youssef said, "If you are struggling with the 'because' you know what might help you? Look at your evidence. Look at the doing word. Ask yourself, what is the character doing, what is the character saying," she reminded students to apply functional grammar analysis to the task of developing a claim.

Summary of practices.

In Unit 2, Ms. Youssef employed various instructional practices that were aimed at supporting students' meaning-making with the text and their understanding of the content and structure of an argument. The analysis of Ms. Youssef's practices reveals their nested nature. At times, Ms. Youssef incorporated small-group and pair-work within the larger structure of a whole-class discussion. Within small-group participation structures, she employed various instructional techniques (e.g., turn-and-talk, role-play, unscrambling the model text, buddy reading) that promoted multimodal learning. To set up each of these small group activities, she provided explicit directions, modeling, or prompts that included the purpose and procedure. The high degree of structure and scaffolding made it more possible for students to engage meaningfully with the text and task. Varying the ways in which students engaged with the text provided more opportunities for students to talk and think about the text with one another. In

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addition to promoting more opportunities for language use, the integration of pair and small-group work allowed for a gradual release of responsibility (Pearson & Gallagher, 1983).

Ms. Youssef's use of the functional grammar metalanguage evolved throughout the unit as she used it according to the lesson plans *and* opportunistically. She began by explicitly referring to the processes as students analyzed the text, and she maintained her explicit use of the metalanguage throughout. By the end of the unit, she was using both the metalanguage of *processes* and *attitude* along with the metalanguage of the stages of a character analysis to help her students apply small-group generated interpretations and evaluations of Sara to their individual written character analyses.

Opportunities for Meaning-Making with Functional Grammar

In Unit 2, explicit functional grammar metalanguage (e.g. process, attitude), the heuristic of the attitude line, and the metalanguage of positive, negative, turn-up and turn-down served as linguistic tools that furthered students' understanding of the characters and supported Ms. Youssef's assessment of students' understandings and misconceptions. Below, I present the analysis of three episodes from Unit 2. The first episode from Lesson 3 illustrates how Ms. Youssef facilitated a microanalysis of the text at the word level to help students understand how two words—whole way—amplified the implied attitude; close reading of these two words bolstered understanding of the characters' attitudes. In the second episode, she used the same text excerpt to help her students make their first evaluations of Sara. The third episode, which is a snippet from a review of how different text excerpts can warrant a variety of interpretations and evaluations, occurred immediately before students began constructing their individual written analyses of Sara.

In the transcription of episodes, I used traditional orthography (e.g., punctuation, spelling, capitalization) and several additional transcription conventions: All CAPITALS indicate a word that was emphasized in the speech; a forward slash "/" indicates multiple student responses that occurred in one turn; brackets "[ ]" indicate overlapping speech; a colon ":" indicates a vowel sound stretched out; periods enclosed in brackets [. .] indicate a long pause, *asterisks* indicate whispered speech, and inaudible speech is indicated by [xxx]. I also maintained the speakers' grammar, including any infelicities resulting from nonnative English discourse.

Interpreting characters' attitudes.

Prior to the episodes discussed in detail below, Ms. Youssef had done several things to prepare her students to analyze the character of Sara. In the beginning of Lesson 3, she had provided 12 minutes of explicit vocabulary instruction during which the class talked about the words *likeable*, *jealous*, *reliable* and *rejected*. These were not words from the story but rather words that could be used to describe the characters and interpret their attitudes. This vocabulary instruction was suggested in the lesson plan for Lesson 1.

After the explicit vocabulary instruction, she reviewed some of the initial claims the students had made about Sara at the end of Lesson 2; these were simple one-sentence statements written in response to the prompt, 'Is Sara a good friend?' Since students were using *being processes* in their claims (e.g., Sara <u>is</u> a bad friend. I believe Sara <u>is not</u> good), Ms. Youssef used the students' claims to reteach the *being process,* an instructional move that was not specified in the written curriculum but was in response to her students' struggle with learning the different process types in Unit 1. She projected several examples of students' claims on the Promethean board and asked the class to identify what they all had in common; she wanted them to notice that all of the claims used a being process. This review of being processes also prepared students

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for learning about how to write a claim in Lesson 5. In the curricular materials, the claim was described as, "a short, clear answer to the prompt; [which] often uses a being process and might use the word 'because' to introduce your reasons." This was further reinforced in Lesson 6 on the "Digging Into Character Analysis" graphic organizer, which said, in the box in which students would write their claim, "Hint: You'll probably use a *being process* + 'because.'"

Then she and the students read the text excerpt that became the focus of analysis in the first two episodes discussed below:

On the first day of the new school year, Sara and Meg walked to school together laughing and talking the whole way there.

In the episode below, Ms. Youssef engaged her students in: 1) an identification of the *process*, and 2) an analysis of the words and the ways in which the words communicated attitude. After they read the excerpt aloud together, she asked, "What's the process here?" and asked her students to discuss this with the person sitting next to them. After a few moments, she interrupted their conversations and asked the whole class, "What's the process here? What is going on here?" The following discussion occurred:

Attitude in the meaningful chunk: "laughing and talking the whole way"
(Source: Unit 2, Lesson 3, 25:42-27:34)

1. S1: The thing that's going on is Sara and Meg are walking to school and they are laughing and talking.

2. T: OK so you walk to school laughing, talking. In what way? In what way?

3. S2: Like— (a student starts to answer looking away from the board)

4. T: Look at the sentence. I don't want you to bring anything from outside the sentence right now.

5. S2: It's saying that they were laughing and talking all the way to school.

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6. T: The WHOLE—

7. S2: time

8. T & S2:   —way.

The exchanges above defined the meaningful chunk.

9. T: OK, children when you are laughing and talking is that a negative attitude, a positive attitude? Think and raise your hand. (She translates the question into Arabic.) So who's ready to tell. [. .] Yes, Amina.

10. S3: Um, it is --

11. T: Is laughing and talking the whole way positive or negative attitude?

12. S3: It's positive.

13. T: It is positive, ok—

14. S3: Because if they're laughing and talking all the way it means that they stick together like best friends and they're enjoying each other.

Ms. Youssef elicited the student's interpretation of the attitude's polarity.

15. T: I like how you explain to me without even asking you. Would you please put laughing on the attitude line. Just the word laughing. (Amina goes to the board where she places the sticky note labeled "laughing" just to the right of neutral, between neutral and positive.) OK, who disagrees with her, who agrees, who has something more to say. She puts laughing here (Ms. Youssef points to the attitude line and students are raising their hands) [. .] Who has something more to say? Farah.

16. S5: [xxx] (pointing)

17. T: Where? Where?

18. S5: She should put it near by positive because they were laughing and talking. She has to put it here (pointing more toward the positive end of the line).

19. T: OK, do you agree that Farah says move it to the positive more positive?

20. S6: [No]

21. T: [You're] shaking your heads no. Why?

22. S7: Because laughing is not a turned-up attitude. It's next to neutral.

Ms. Youssef encouraged varied interpretations and reasoning to justify those interpretations.

23. T: How can I turn it up? (Students gasp and raise hands.) [.] How can I turn it up? (She translates into Arabic.) [.] Kamil.

24. S8: I can put another word instead of laughing, you could put a stronger word.

25. T: OK look at the sentence. You are one hundred percent right but look at the sentence. Did the author help me, by adding something that will make it turned up?

26. S9: Talking?

27. T: Which part did the author use to help me show that this is a strong attitude?

28. S10: *on the [first day]*

29. T: [A turned-up] Khalil?

30. S11: Talked the whole way.

31. T: The whole way. So if I add laughing who:le way (she translates into Arabic and writes "whole way" on the sticky note underneath "laughing") now where would I move this laughing whole way. [.] Where would this go. Hadiya?

32. S12: It's going more toward the positive.

33. T: It will be more intense so it will be more towards the positive.

Ms. Youssef helped the students recognize how the words "whole way" amplified the positive attitude.

The above episode shows how the functional grammar metalanguage of attitude, in particular polarity (positive, negative, neutral) and force (turned-up, turned-down), supported students' analytical thinking. The heuristic of the attitude line made the abstract notion of

characters' feelings concrete. The ways in which Ms. Youssef used the attitude line enabled and validated the representation of varied interpretations. She refrained from expressing any preconceived idea of where the word "laughing" should be placed on the line, which encouraged students to genuinely reason and form an opinion.

Ms. Youssef co-constructed this opportunity for meaning-making with her students. The Lesson 3 plan suggested using the text excerpt, "On the first day of the new school year, Sara and Meg walked to school together laughing and talking the whole way there," to help students interpret Sara's attitude and determine what it showed about her character, but the lesson plan did not explicitly specify the *process* or the *attitude* in this excerpt. Nor was this excerpt included in the three-column organizer key. Here is how the lesson plan supported this episode:

Read the second half of the story aloud as a group.

(*Some of the attitudes here are going to be ambiguous, so work with the Ss to explore all the different emotions that the characters might be experiencing at this tricky time in the story. It might help to have the students picture themselves in these situations. Also, their interpretations might change if they look at Sara-Meg and Sara-Kylie relationships separately. Take your time as you dig into this part of the story, and feel free to unpack other examples that are not listed here. Refer to the prompts to keep the conversation on track and to keep thinking about what makes a good friend…*)

Ask students to find words with attitude in the first sentence:
On the first day of the new school year, Sara and Meg walked to school together, **laughing** and talking the **whole way** there**.**

Are these positive or negative? Turned up/down?
Where would you put them on the attitude line?
Do they show us something about Sara? What?

Ms. Youssef did not strictly adhere to lesson plan. Instead, she continued to use the structure of the progression of analysis from Unit 1 to approach the text systematically. If Ms. Youssef had followed the lesson plan as written, several important meaning-making building

blocks would have been omitted: identifying the meaningful chunk, reiterating the progression of analysis, considering the words "laughing" and "whole way" in the context of the whole meaningful chunk, and allowing the discussion to unfold in response to students' contributions.

At the beginning of this episode, she asked her students to identify the process, what was happening in the sentence. Identifying the process was not in the lesson plan, but the first eight lines of the transcript illustrate how identifying the process established the context for analyzing Sara's attitude (lines 1-8); Ms. Youssef's exchanges with S1 and S2 reinforced the notion that the first step in text analysis is to identify the meaningful chunk. Doing so reinforced the progression of analysis she had established in Unit 1. Then, with Ms. Youssef's guidance, the students honed in on the words "laughing and talking" and "whole way." She elicited students' interpretation of the attitude's polarity (lines 9-14), and then she and the students used the attitude line as a tool to discuss the attitude's force, *how positive* was the word "laughing" (lines 15-22). When she asked how the word "laughing" could be turned up, and reminded her students to look back to the text to see how the author turned-up "laughing," the words "whole way" helped students determine that the positive attitude shown in this sentence was amplified. Modifications, such as the ones revealed in Ms. Youssef's enactment of this portion of Lesson 3, illustrate the difference between the written curriculum and the enacted curriculum. As discussed earlier, as part of a design-based research project, and recognizing the limitations of a written curriculum, the research team expected and encouraged teachers to make modifications, which would then inform the iterative design process.

Notice the last question in the lesson plan: Do they [the attitude words] show us something about Sara? Ms. Youssef did not ask this question at this point in the lesson. Returning to the heuristic of the three-column organizer, she asked students to determine what

attitude "laughing and talking the whole way" showed. She asked students to discuss this in pairs. When they came back together as a whole group, the students suggested that this process showed that Sara was, "happy, enjoying, excited, glad, joyful, extremely happy." As in Unit 1, these discussions about the attitude and students' interpretations of the character's attitude served as a foundation for the subsequent step, which was to determine what this attitude showed about the character's persona (i.e., to evaluate the character). The sequence of this inquiry, and the regularity with which it happened, supported students' construction of causal and referential relations (Van den Broek & Kremer, 2000).

Evaluating character.

The following episode occurred immediately after the students had offered the above interpretations of the attitude shown in the phrase "laughing and talking the whole way." They said that this process showed that Sara was "happy, enjoying, excited, glad, joyful, extremely happy." At this point in the lesson, they were still focused on the following text excerpt:

On the first day of the new school year, Sara and Meg walked to school together laughing and talking the whole way there.

First evaluations of Sara
(Source: Unit 2, Lesson 3, 39:10-41:33)

1. T: So does it show an attitude? Yes. She has been happy or very happy. Any word that makes sense I will accept. You have to say that. What does it show - this attitude - what does it show about her personality? We're talking about Sara. When she acted in this manner, what does that tell you about her character? (She translates it into Arabic.)

2. S2: She doesn't miss her [.] Kylie?

3. T: OK. Maybe, OK Sara does not miss Kylie (She writes this on the board as she says it aloud.)

4. S3: How?

5. T: This is what she thinks and her evidence is that she was walking, talking the whole time. Who has something else different than what Amina said?

6. S4: Hesitant?

7. T: She is hesitant? Not sure?

8. S4: Yeah, cause maybe if she goes to her tree house and wants to draw or if she can play with her--

9. T: This statement (referring to "laughing and talking the whole way") does not show me anything about hesitant. Sorry. Nadia?

10. S5: Sara is now being loyal to Meg.

11. T: Sara is being loyal to Meg. (She writes this on the board as she says it aloud.) Do we understand the example right now.

12. Ss: Yes.

13. T: OK, so our explanation right here (pointing to the 3rd column in the three-column organizer) can be any explanation as long as it relates to the example (i.e., text excerpt). You have my permission for one minute only to copy these three parts. But with the other examples, you will do the work.

The above episode shows how Ms. Youssef used the three-column organizer as a conversation guide and a place to document students' thinking. This visual artifact, which was co-constructed throughout the unit, represented the collection of students' words and their meaning-making paired with the text (see Figure 5.4). As in Unit 1, it served as a scaffold for students' establishment of referential and causal relations (Van den Broek & Kremer, 2000). Here is what the three-column organizer looked like at the end of the episode above:

Words from story: *Character actions, dialogue, attitudes*	*Do these words show feeling or opinion? If, so what emotion?*	*What do these words show about what kind of person she is? (Is she a good friend or not?)*
Sara and Meg walked to school together laughing and talking the whole way	happy, very happy	Sara does not miss Kylie. Sara is being loyal to Meg.

Figure 5.4. The three-column organizer at the end of the episode: First Evaluations of Sara.

The stages of a character analysis.

In Lesson 5, Ms. Youssef used the power point slides provided in the materials and a model text to teach the stages of a character analysis. She followed the lesson plan directions closely. She and the students read the power point slides, which provided an overview of the purpose of a character analysis, the prompts (the one for the Kylie model and the one to which the students would write about Sara), an overview of the stages, and then a slide explaining each stage: the purpose of the stage, the language features in the stage, and an example. Below are two examples of the slides: one providing the overview and the slide for the claim:

Stage of Character Analysis

What are **stages**? *The different **parts** of a character analysis. Including these will help your reader understand your ideas.*

- Claim
- Orientation to evidence
- Evidence
- Interpretation
- Evaluation

Claim

Purpose: Makes a careful judgment (what you think of them) about the character + gives a *short* overview of your reasons
- If there is a prompt, it is a short, clear answer to the prompt

Language features:
- Often uses a being process
- Might use "because" to introduce your reasons
- Often the first sentence in a paragraph!

Example: Kylie is a terrible friend because she stops sending emails to Sara.

The model text was cut into strips of paper, and on each strip of paper was a stage of the character analysis. In groups of three, and with the help of the slides, students worked together to identify each stage and put them in order. Ms. Youssef led the students through this exercise one stage at a time.

In Lesson 6, Ms. Youssef asked the students to return to the text and reread it to identify all of Sara's actions, dialogue or feelings. With another student as her partner, she modeled how to reread the text and together, identify and discuss "anything that shows me or tells me something about Sara," (Ms. Youssef, Unit 2, Lesson 6, time stamp 5:45). She gave the students five minutes for this buddy reading activity. When they returned to the whole class, Ms. Youssef used the three-column organizer *key* provided in the curriculum materials to review the text excerpts that showed or told the reader something about Sara (see Unit 2: Three-column Organizer Key for Sara in Appendix A). She projected the three-column organizer key on the Promethean board and elicited students' thinking about these text excerpts; in particular, she elicited their evaluations of Sara.

Sharing evaluations made during independent work
(Source: Unit 2, Lesson 6, 17:59-23:23)

1. T & Ss: (excerpt from story) "Sara bowed her head."

2. T: And many of you told me when she bowed her head what was that? <u>Why? Why did she do that? What does that show me about her personality?</u>

3. S1: She felt sad about [herself].

4. S2:   [Nervous?] Nervous?

5. T: She felt sad about herself.

6. S3: She hated her [friend.]

7. S2:   [Nervous]

8. S4: She felt, [she was] sorry.

9. S2:   [Nervous.]

10. T: Nervous?

11. Ss: Guilty?

12. T: She was sorry.

13. S3: Guilty?

14. T: Guilty. Ah let's read. Let's read this part.

15. T & Ss: (evaluation from the key) *"Sara feels bad for hurting Kylie's feelings OR she's confused about which friend to side with in this situation."*

16. T: Is she in a good position now?

17. Ss: No.

18. T: No! Now she has Meg on one side, she has Kylie on the, on her other side and she is in a tough situation. She has to make a decision. Nobody wants to be in that position.

This episode above is an example of how Ms. Youssef quickly reviewed the five text excerpts from the three-column organizer key, all of which she and the students had analyzed in depth previously. Although the student turns in this episode were brief, the run of student ideas suggests that students were constructing individual interpretations and evaluations. Several of the words they used to describe Sara (e.g., sorry, nervous, guilty) also suggest that they were developing a broader, more nuanced vocabulary with which they could interpret characters' feelings and evaluate their personae.

Interestingly, neither the buddy reading nor the review of the three-column organizer key was specified in the written lesson plan. The Lesson 6 plan suggested that teachers use the "Digging Into Character Analysis" graphic organizer to model how to write each stage of the

analysis of Sara while the students follow along and complete the graphic organizer using their own ideas. The video data from Lesson 7 suggests that at the end of Lesson 6, Ms. Youssef and the students completed the first half of the graphic organizer: the claim, the evidence and the orientation to the evidence. However, it is not clear how she supported students in doing so because this instruction was not captured on video. We can infer how this instruction may have occurred from Lesson 7 video data in which she reviewed their work from the end of Lesson 6 and provided scaffolding for the completion of the graphic organizer.

Ms. Youssef did not model a character analysis for Sara nor complete the graphic organizer along with the students as the Lesson 6 plan suggested. Instead, Ms. Youssef referred to the model character analysis of Kylie included in curricular materials, which she had used along with the scramble activity in Lesson 5 to teach the stages. In her reflection log, she mentioned this modification in response to the question: How well did the materials and the PD support you to MODEL and WRITE a Character Analysis? In her log, Ms. Youssef wrote:

> I felt very prepared and I took a daring decision when I decided not to model writing
> Sara's prompt because the students would copy my model. I have experienced that
> throughout my teaching for writing. I kept Kylie's model, and I referred to it when they
> had to make a claim about Sara, with constant reminders that they are writing about Sara.
> It took longer for them to do it on their own, but the results were worth it. (Youssef, Unit
> 2, reflection log 2)

She reviewed each stage before the students wrote each stage, and she read and reread the directions on the graphic organizer to help students understand what they were supposed to write in each box. She also used examples of the students' writing to help the rest of the class revise their graphic organizers along the way.

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Summary of opportunities.

In the above section, the analysis of illustrative episodes and teacher-student, co-constructed artifacts exemplify the opportunities for meaning-making that arose in Ms. Youssef's enactment of Unit 2. These included instances in which whole-class discussions informed by functional grammar created opportunities for students to: 1) interpret characters' attitudes and personae, 2) evaluate characters based on their actions, speech and attitudes, and 3) construct an oral analysis, in preparation for writing, defined by sequential, logical stages. Although not specified in the lesson plans, Ms. Youssef continued to approach the analysis of text excerpts in a patterned, systematic way that enabled her to begin gradually releasing more responsibility to the students as they worked together in pairs to answer questions about the text.

Through discussions about specific text excerpts from the story specified in the three-column organizer or the lesson plans, Ms. Youssef was able to support students' meaning-making with the text. The heuristic of the attitude line and the metalanguage of positive, negative, turn-up and turn-down served as linguistic tools that furthered students' understanding of the characters. The three-column organizer that facilitated the analysis of text excerpts about Sara was co-constructed throughout the unit; it served as a visual artifact of student thinking and a conversation guide. Ms. Youssef's use of this tool made explicit the connection between the text and their interpretations and evaluations (Van den Broek & Kremer, 2000), as illustrated in the episodes from Lesson 3. Ms. Youssef also made skillful use of the three-column organizer *key* to reinforce the connection between the text excerpts under discussion and the varied interpretations and evaluations these excerpts warranted. Ms. Youssef used the power point slides and the "Digging Into Character Analysis" graphic organizer provided in the curriculum to support students in applying the analysis generated in discussions to their individual written

character analyses of Sara. Next, I will turn to the challenges that arose during Ms. Youssef's enactment of Unit 2.

Challenges with Metalanguage

Despite the fact that Ms. Youssef provided a high degree of scaffolding, explicit attention to language in the text, and multiple opportunities for pair and small group work in this unit, some learning and teaching challenges still arose in Unit 2. Consider the inherent complexity in supporting students to read a narrative text for the purpose of constructing a character analysis. They need to understand how to interpret a character's actions and dialogue, use these interpretations as the basis for evaluating the character, and synthesize those interpretations and evaluations to construct an overall opinion, or claim, about the character. The curriculum provided a driving question that was intended to be a purposeful thread throughout the unit: "Is Sara a good friend? Why or why not? Provide evidence to support your ideas." This was also the prompt to which students would write their final analysis. The curriculum also provided many tools with which teachers could support students' construction of a character analysis (e.g., the three-column organizers, the heuristic of the attitude line and its accompanying metalanguage, the "Digging Into Character Analysis" graphic organizer that explicitly outlined the stages of an argument). Ms. Youssef's skillful use of these materials made a very abstract process quite concrete. However, students still had to contend with the language in the text, and Ms. Youssef had to contend with the limitations of the written curriculum, such as the lack of support specific to teaching the *reason* stage in an argument. Metalanguage was a tool for addressing students' challenges with the text. Without metalanguage, it is difficult to talk about the structures and functions of language in text.

Below, I present two episodes that illustrate some of the challenges that were revealed in Ms. Youssef's enactment of Unit 2. The first episode illustrates how Ms. Youssef used the attitude line to clarify a student's interpretation of Sara's attitude. In this first episode, functional grammar metalanguage and the heuristic of the attitude line helped to unpack the student's thinking. The second episode illustrates how Ms. Youssef struggled to find the language to support students' construction of the reason portion of the claim. More explicit metalanguage for the reason stage of the argument could have helped clarify the content and the purpose of a reason in an overall claim made about a character. Implications of not having a common metalanguage for talking about genre stages are discussed.

Understanding characters' body language.

After a choral reading of the passage, "Sara stood there with her arms pinned to her side as she closed her eyes and braced herself against the force of Kylie's hug," Ms. Youssef asked the students to act out this passage in groups of three. As the students formed groups and engaged in the activity, Ms. Youssef circulated among the groups.

After the role-play, she gathered the students' attention to discuss the attitude of the character, Sara, in this passage. This episode illustrates how the language in the text presented a challenge for one student, and although other students' misconceptions are not revealed in this episode, it is fair to assume that others may have been challenged by this passage or other passages in the text.

Arms pinned to her side
(Source: Unit 2, Lesson 3, 50:58-58:00)

1. T: With the same team, I would like you to look at the example and tell me, what is the process that's happening here? What's going on here?

2. S1: The attitude she is like, Sara she knows her, she knows Kylie but she she used to be her old friend.

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3. T: Which words show attitude here?

4. S1: Kylie hugged Sara.

5. T: OK, what else

6. S2: Kylie likes Sara but wants Sara—

7. T: I want the words from the example first that show attitude.

8. S3: "braced herself against the force of Kylie's hug"

9. T: OK, she braced herself (underlines the words "braced herself" in text projected on the board) Before that, is there an attitude?

10. S4: She pinned.

11. T: Pinned what?

12. S4: "Sara stood there, arms pinned to her side."

13. T: Pinned to her side (highlights "pinned to her side") and stood there (highlights "stood there"). She stood there, OK. Now I want you to look at your graphic organizer. Where would these words go. Where would they go. Under what column.

14. Ss: Character's attitude dialogue/language/the first column/Words from story

15. T: Words from story. Your job now is to discuss with your group, what does this show about her? Now when you are standing there, her arms pinned to brace herself against the hug, is this a positive or a negative attitude?

16. Ss: Negative

17. T: I would appreciate it if we raise hand: positive or negative? Why negative?

18. S5: Because she was, she didn't want to hug her because she forgot about her.

19. T: OK class, we agreed it's a negative attitude. Is it a turned up or turned down and why?

20. T: We said stood there and arms pinned as she braced herself against the hug of Kylie's that's a negative attitude. Is it turned up, turned down, why? [pause] Is it a strong or is it a weak attitude?

21. S6: It's turned up.

22. T: Why?

23. S6: Because she was, she was, she didn't want to hug him cause she forgot about him.

24. S7: Him? Her!

25. T: Come, where would you place it on the attitude line?

26. (S6 places this attitude to the left of neutral toward negative).

27. T: Do you agree, do you disagree and why? Hands up. (To S6: Thank you, well done.) Do you agree? Do you disagree? She—her arms pinned, she braced herself.

28. S8: I agree because she's [xxx] and didn't want to hug her.

29. T: Is this a strong attitude?

30. Ss: Yes.

31. T: When she is pinned herself?

32. Ss: Yes

33. S8: No.

34. S9: Why? (directed to the S8 who said No)

35. T: Why? (directed to the S8 who said No)

36. S8: Because she was holding tight.

37. T: How did you feel? What was your role? What was your role when you were acting?

38. S8: Sara.

39. T: You were Sara? So you are the one who pinned yourself. When Kylie tried to hug you, how did you react?

40. S8: Like this. (He showed his arms down by his side with his body stiff.)

41. T: How was your expression on your face?

42. S8: Like that. (Showed a blank expression.)

43. T: Is that a strong attitude a turned up or a turned down?

44. S8: Like half positive half negative.

45. T: Ok go adjust it. (pointing to the attitude line)

46. S8: Right there (placing the attitude sticky note to the right of neutral toward the positive)

47. T: So it was a negative attitude or a positive attitude to [xxx] her?

48. S8: Positive.

49. T: But you didn't accept her hug.

50. S8: Because she pinned her arms to her side.

51. T: She didn't want to hug her. Is that a good thing or a negative thing?

52. S8: Negative.

53. T: So you can't move it to the positive. (She moves it back to where it had been) It is still negative but was it a strong attitude? (Pinning her arms to her side) I don't want to hug you. I really don't want to hug you or it's ok. What was it?

54. S8: She feels right here (waving his hand toward the negative end of the spectrum).

55. T: OK, move it over here.

56. (S8 moves the sticky note toward the negative.)

In the above episode, Ms. Youssef first asked her students to identify the *process*, what was happening in the passage (line 1). She called on several students who were eager to offer interpretations of Sara's actions, but she redirected them back to the text. "I want the words from the example first that show attitude," she explained (lines 2-12). Once they identified the processes that showed attitude—braced herself against the force of Kylie's hug, Sara stood there, arms pinned to her side—she used the three-column organizer and the heuristic of the attitude

line to facilitate the discussion and support students' interpretation and evaluation of Sara. The attitude line on the blackboard served as a concrete tool to discuss both the *polarity* (positive and negative quality) and the *force* (intensity) of Sara's attitude.

At line 33, a series of exchanges reveal that S8 was interpreting Sara's resistance as a positive attitude. When the student's logic wasn't clear, Ms. Youssef used the attitude line to engage him in clarifying his interpretation. This revealed that he had not interpreted Sara's body language, "arms pinned to her side," as a negative expression, as Sara not wanting to hug her old friend in return.

This episode illustrates the challenge this student—and perhaps others—encountered with the text itself. Narrative fiction texts can be challenging for English learners because of colloquial phrases that carry important implicit meanings (Bernhardt, 2006, July). With the help of the attitude line, Ms. Youssef was able to more fully understand where meaning was breaking down for this student.

Constructing a claim.

In this unit, students were given the task of making a claim about Sara. Their claim was intended to be the first sentence in their written character analysis. The "Digging Into Character Analysis" graphic organizer suggested that their claim would be the answer to the question, "Is Sara a good friend. Why or why not?" For example, "Sara is a good friend because she was friendly to the new girl next door" could be a claim. It has two parts: a statement claiming whether or not Sara is a good friend and a reason, a brief explanation to the question why or why not. This whole sentence would comprise the first stage, the claim, but the claim was often referred to as just the first part of the whole sentence, just *Sara is a good friend* or *Sara is not a good friend*. The part after the "because" has a name as well. It is called the reason. The slides

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refer to this part of the claim as *the reason* and the graphic organizer also defines the claim as the "Statement evaluating the character + reasons. (Your short answer to the prompt + reason.)" So the claim really has two parts: the evaluation and the reason or reasons.

In the Lesson 6 plan, teachers were encouraged to have their students initially write just the first part of the claim without the reason. This was followed by selecting and writing the evidence and the orientation to the evidence. Then the students were instructed to go back to their claim and add a reason. In the lesson plan, this was supported with the following directions:

> Add the reason to the claim, addressing the evidence in a general way. You do it and then allow students to add to theirs, based on the evidence they chose.

Constructing a reason that justified the claim and "addressed the evidence in a general way" was challenging for the students, and it was challenging for Ms. Youssef to support students in writing this part of their character analysis. Perhaps this was challenging because the *reason* aspect of the argument was not its own stage. The reason was connected to the claim, and it needed to be an overarching reason for which the evidence would serve as one example. But this relationship between the claim, the reason, and the evidence was not emphasized or made explicit in the materials. Depending on how much—or how little—attention this claim-reason-evidence relationship received in the professional development institute, it could have been a source of confusion during enactment. Compared to how much the other stages were explained in the lesson plans and how much attention they received in the power point and on the graphic organizer, there was very little explanation for how to support students in developing a reason. And yet, it was an essential part of the character analysis and an essential ingredient for the coherence of the argument. Prior to this episode, the students had selected their evidence and written an orientation to that evidence to provide the reader with some context for the character

analysis. As is evident in the episode below, Ms. Youssef did not have a clear way to explain the

role of the reason or how to construct one.

Writing the "because"
(Source: Unit 2, Lesson 7, 9:24-11:57)

1. T: Today we are going to continue, yesterday I told you when we write the claim, just give your opinion. What do you think? Is Sara a good friend or is Sara a bad friend? I told you never write a because yet. Today, you are going to start by going back to the claim and write because. I would like to refresh your memory. Always, always feel free to look at these parts (pointing to three-column organizer on the wall). Ok. I want to put claim again but let's look at Kylie's example. Let's read it all together if you can see it.

2. Ss: (reading off of the chart) "Kylie was a wonderful friend—"

3. T: Stop. Right there. Kylie is a wonderful friend. What part is this?

4. Ss: Claim/The claim/The stand

5. T: The claim. After the claim, look what happened.

6. Ss: "because she is so excited to see Sara on the first day of school."

7. T: Can I put this statement for everyone? No.

8. Ss: No.

9. T: This one correlates with the evidence. Correlates means they go together. Here (reading off of the model on the board) "she came running with her arms outstretched to hug her friend." So I am slightly explaining very briefly, very shortly, explaining her behavior in the evidence. (She translates into Arabic.) Right now, which part we will be working on?

10. Ss: Sara.

11. Sara. Character, character is Sara. But which part are we going to revisit (pointing to the Promethean board).

12. Ss: Claim.

13. T: The claim. What am I going to do with the claim?

14. Ss: Oh put because.

15. T: What part I need to add [today]

16. Ss: [because]

17. T: The because. The because. But are you going to put a because just from the air?

18. Ss: No.

19. T: You are going to look at your evidence and look what you chose and think about the because explain why. Very short, very short.

> Ms. Youssef continued to try to explain how to develop a reason. A few minutes later, she decided to model this with a student example.

20. T: Ok before you write, I am going to model with Isa's piece. I am going to model with Isa's piece. But you cannot copy Isa's, right? Let's look at Isa's. Isa's claim that Sara is a good friend. Good. I am going to look at her evidence. "Sara glanced at Meg and smiled." What do you think I am going to continue writing. Help me here, Isa. Sara glanced and smiled at Meg. This is your evidence for Sara being a good friend so I need to finish your statement. What can we say? The rest of you think to help her. But she has to think about it as well. Sara is a good friend because?

21. S1: Because Sara glanced at Meg and smiled.

22. T: Right. But I cannot take the exact words of the author. I took them in the evidence. Now I need to explain them a little bit, not much. Sara is a good friend because? Raise your hand if you can help her finish the statement. Think.

23. S2: Sara is a good friend because Sara smiled at Meg.

24. T: Ok, what we know about the story that Sara was always having a good time with Meg. Right?

25. S2: I didn't finish.

26. T: Ok go ahead.

27. S2: Because Meg told Kylie [xxx]

28. T: Ok, after I write because I'm not going to tell the story. Isa.

29. S1: Sara is a good friend because Sara glanced at Meg.

30. T: OK, I just told you sweetheart we cannot put these exact words. Explain them to me in a different way. Say them differently.

> The students' reasons start to become more general and abstract from this point onward.

31. S3: Sara is a good friend because she was loyal to her.

32. T: OK, another one.

33. S4: Sara is a good friend because she plays with anyone.

34. T: Oh, Sara is a good friend because she plays with anyone. What do you think of this uh, of this claim?

35. Ss: Good.

36. T: Why good?

37. S5: Because she was being kind to Meg.

38. T: She is being kind to Meg and—?

39. Ss: And Sara/And Kylie/She's happy with Meg/with two girls

40. T: Just Meg?

41. Ss: No/Kylie/And Kylie

42. T: And Kylie. What's another one?

43. S6: Sara is a good friend because she likes to play with Meg and Kylie.

44. T: Because she likes to play with Meg and Kylie. Ok. Yes? (pointing to another student) You have to say it differently. You cannot use the words directly from the text for your claim. Explain them in a different way, say them differently.

45. S6: Sara is a good friend because she enjoys being with Meg.

46. T: Let's take the first one: Sara is a good friend because she played with everyone. This is only Isa's paper. What are the two things I looked at? What are the two things I looked at?

47. Ss: Claim/ And evidence

48. T: The claim and evidence. So each one of yours is going to be different. What are you going to explain? That because part. You may begin.

    (Students start writing their reasons.)

49. T: (She interrupts the independent work time to give them some support) Here is a hint, class. If you are struggling with the "because" you know what might help you? Look at your evidence. Look at the doing word. Ask yourself, what is the character doing, what is the character saying. When we were doing Isa's one, Isa said she smiled, uh she glanced and smiled. So in other words, because, she played with everyone. So look at your doing word in the evidence and see if that's going to help you.

With the model of the analysis of Kylie, Ms. Youssef asked the students to identify the claim (lines 1-4). She then directed students' attention to the reason that supported the claim (lines 5-6) and explained the connection between the reason and the evidence (lines 7-10). She clarified the function of the reason: to briefly explain the character's behavior in the evidence (line 9). When Ms. Youssef redirected students' attention to Sara and reviewed the objective for the lesson, to write "the because" (lines 10-19). After giving students some time to work independently on writing their reasons, she brought the students back together as a whole class to provide more instruction on how to develop a reason. She used a student work sample to scaffold the process of using the evidence they had selected to develop a more general reason that supported their claim (lines 20-30). Ms. Youssef reminded students several times that they need to explain the evidence very briefly in a different way (lines 9, 19, 22, 28, 30, 44). As the episode progressed, students' reasons became more general (lines 31, 33, 43) and she elicited students' evaluations of each others' reasons (line 34).

Throughout this episode, Ms. Youssef never used the metalinguistic term *reason*. She referred to the reason as the "because." The absence of the metalanguage for *reason* was noticeable in the episode and may have contributed to the ambiguity of this stage. The curricular materials did not identify the reason as a separate stage in a character analysis, explain how to

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develop a reason to support the claim, and/or make the claim-reason-evidence relationship explicit. Ms. Youssef addressed this challenge by modeling this process with the Kylie model and a student example, and reminding students to look at the *doing process* in their evidence to extrapolate what this action or dialogue was evidence of.

This episode illustrates the challenge of teaching the function of linguistic features without an accompanying metalanguage to name those features. The metalinguistic terms also support discussions about the relationship among those features. In this episode, Ms. Youssef substituted the term "because" for *reason,* and this substitution seemed to suffice for the task at hand. However, one of the purposes of learning about language in genre-specific ways is to enable cross-disciplinary connections. In future experiences with developing arguments, if students have learned metalanguage for the stages and features of an argument that are commonly used in the genre, then students can more easily apply this genre-specific language from one context to the next.

Summary of challenges.

Interpreting characters' attitudes in narrative text requires students to think abstractly. This is not an easy task for young readers, especially when reading text that is written in one's second language. Analyses of classroom discourse suggest that some students struggled with interpreting Sara's attitudes; perhaps this was due to how characters' attitudes were presented through colloquial phrases in the text. The metalanguage of *positive*, *negative*, *turned-up* and *turned-down* gave Ms. Youssef and her students a way to talk about the nuances of attitude. Along with the heuristic of the attitude line, this metalanguage helped Ms. Youssef assess students' understanding and support students in learning how to interpret implicit meanings in narrative text.

During her enactment of Unit 2, Ms. Youssef used the metalanguage of argumentation to support students' construction of a character analysis. Using metalanguage of stages to dissect a genre into discrete parts can help make explicit the various elements that comprise a genre. Ideally, students can use this genre-based metalanguage as a way to recognize the patterns and forms in the language across disciplines. Without a metalanguage, it can be difficult to talk about the parts of an argument and their relationship to one another. This challenge became apparent in the *Writing the "Because"* episode described above.

Although the *reason* had not been described as its own stage in the written curriculum, Ms. Youssef realized her students needed explicit instruction on how to construct a reason that made a generalization about the character and directly supported the claim. In her instruction, Ms. Youssef referred to this stage as the "because," but in more common argumentation taxonomy, this stage is referred to as the *reason*. Using more common argumentation metalanguage, such as the word *reason*, may be more supportive of students' overall language learning and meaning-making. Learning genre-specific metalanguage and using metalanguage in meaningful contexts may help students recognize patterns in language and in turn become more cognizant of how they can use their metalinguistic knowledge as a tool for meaning-making with texts across disciplines.

Conclusion

In Unit 2, Ms. Youssef and her students read the short story, *Best Friends* (Symons, 2012). In this story, three girls—Sara, Kylie and Meg—negotiate the issue of fidelity in friendship. In this study of Ms. Youssef's enactment of Unit 2, I addressed the question: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific teaching practices, tell us about the opportunities and challenges

of a functional grammar approach to supporting student' meaning-making with *narrative fiction*

text? This unit was designed to 1) help students use functional grammar to analyze the

characters, and 2) write a character analysis in response to reading the story. This meaning-

making consisted of engaging in text-based discussions, informed by functional grammar, to co-

construct analyses of two of the characters (Kylie and Sara). The functional grammar analysis

embedded in the lessons was intended to help students use the metalanguage of attitude,

including polarity (positive/negative) and force (turn-up/turn-down), to discuss their

interpretations and evaluations of the characters in the story. The metalanguage for the stages of

an argument was integrated into the lessons to support students in understanding the structure

and the purpose of a character analysis and scaffold the process of writing a character analysis:

1) a *claim*, 2) an *orientation to evidence,* 3) *evidence,* 4) *interpretation,* and *5) evaluation*.

Instructional Practices

In her enactment of Unit 2, Ms. Youssef's employed many instructional practices. Two

key instructional practices surfaced: the use of varied participation structures and the deliberate

yet flexible use of the functional grammar metalanguage. Ms. Youssef's use of varied

participation structures (e.g., whole-group, small-group and pair work) allowed her students to

interact with the text and one another through reading, writing, speaking, role-play, and hands-on

experiences. Often used as extensions of the whole-class structure, the pair work and small

groups increased the opportunities for students to use language to talk about the text.

Ms. Youssef's use of the functional grammar metalanguage evolved throughout the unit,

which was reflective of the written curriculum. Building on what students had learned in Unit 1,

Unit 2 started with the use of explicit functional grammar metalanguage (e.g., *processes* and

attitude) to interpret characters' attitudes and evaluate their personae and culminated with

argumentation metalanguage to help students learn the stages of a character analysis and use these stages to structure an argument about the character, Sara. While Ms. Youssef enacted the curriculum with fidelity, she also used the functional grammar metalanguage flexibly and opportunistically to support students' meaning-making with the text.

Opportunities for Meaning-Making with Functional Grammar

Ms. Youssef used functional grammar metalanguage to support her students' meaning-making. The heuristic of the attitude line provided a concrete tool with which she and her students interpreted the *polarity* and *force* of Sara's attitudes. Similar to the progression of analysis in Unit 1, Ms. Youssef elicited students' interpretations of Sara's attitude and their evaluations of her character. Unlike Unit 1, this unit was focused on preparing students to write a character analysis. Throughout the unit, Ms. Youssef kept this purpose foregrounded as she consistently reiterated the driving question, or writing prompt: Is Sara a good friend? Why or why not. Give evidence to support your ideas. She used the curricular materials (e.g., the three-column organizer, the "Digging Into Character Analysis" graphic organizer, the model texts and the power point slides) as both conversation guides and scaffolds for students' writing of a character analysis.

Challenges with Metalanguage

In Unit 2, two sets of metalanguage were used explicitly with students: the metalanguage of *processes* and *attitude* and argumentation metalanguage (e.g., the stages of an argument). Metalanguage can be a tool with which to mitigate challenges students encounter with text. Without metalanguage, talking about the features or structures of text is challenging. One of the challenges that surfaced in Ms. Youssef's enactment of Unit 2 is a challenge inherent in teaching literary interpretation. Some of the students struggled with the language in the text that

demanded the deciphering of colloquial phrases and descriptions of characters' body language that were abstract, especially for English learners. In response to this challenge, Ms. Youssef used the metalanguage of *positive*, *negative*, *turned-up* and *turned-down* and the heuristic of the attitude line to assess students' understanding and support students in understanding the nuance of characters' implicit attitudes. At another point in the unit, when Ms. Youssef was teaching students how to develop a reason in support of their claim, she did *not* use metalanguage to talk about the reason. Instead, she referred to the reason stage as the "because." Based on the reasons students generated during this episode, they understood the purpose of the reason stage, but without calling it a *reason*, they may not recognize it as a feature of the argument genre in other contexts. It was also challenging for Ms. Youssef to support students in taking a set of concrete examples that serve as evidence and turning them into a broader, overarching generalization about the evidence. This calls for new language resources that the materials did not support developing.

Implications

This study of Ms. Youssef's enactment of Unit 2 illustrates how functional grammar analysis is an instructional technique that can be observed at the level of the discourse moves as it shapes the ways in which the teacher and students talk about the text. As an instructional tool, if teachers understand the purpose of functional grammar analysis and how it helps students unpack implicit meanings in text, it can be used opportunistically and flexibly to support students' meaning-making. The metalanguage used to talk about language in text can either be implicit or explicit. When made explicit and used routinely, it becomes part of the classroom's shared discourse. It can be used as a tool to highlight particular features of text during reading and discuss nuances of characters' attitudes in narrative texts. Metalanguage can also be used to

teach the stages of target genres for writing, such as an argument. In preparation for writing, the metalanguage of argumentation serves as a scaffold for discussions in which students practice generating claims about characters, selecting text-based evidence, and developing reasons to support their claims. Without a metalanguage to name the stages of an argument, it is difficult to make the structure and purpose of the genre explicit for students.

Furthermore, Ms. Youssef's enactment of Unit 2 illustrates how varied participation structures can promote different ways of engaging with text and encourage multimodal learning. With high degrees of scaffolding, students can engage in meaningful discussions about text as a whole class, in pairs and in small groups. After substantial experience with a consistent progression of analysis in a whole-class context, students understand and come to expect particular types of questions about text, such as: What's going on here? Which words show attitude? What attitude does it show? What does this tell you about the character as a person? When new participation structures are introduced as extensions of the whole-class context, students can draw upon the whole-class discourse model to inform their pair and small group discussions.

In both Units 1 and 2, Ms. Youssef consistently supported students in identifying the meaningful chunk, reiterated the progression of analysis, analyzed the meanings of words and phrases in the context of the whole meaningful chunk, and allowed discussions to unfold in response to students' contributions. The occurrence of these practices across two units of instruction with narrative texts suggests that, in the context of teaching and learning, a linguistic orientation to meaning-making includes the teachers' knowledge of linguistic features in a text (Turkan et al., 2014), a consistent and patterned way of framing causal questions about the text (Van den Broek & Kremer, 2000), explicit attention to specific meaningful words and phrases

within text excerpts (Schleppegrell, 2013), and the ability to respond to students' contributions (Pearson & Fielding, 1991) so that they are supported in incrementally constructing a coherent mental representation of the text (Kintsch, 1986). On the one hand, Ms. Youssef's enactment is a unique reflection of the interaction among the written curriculum, her pedagogy, and her students (Remillard, 2005). On the other hand, the patterns of practice that emerged from the study of her enactment point to areas worthy of future research. Because the practices she employed consistently created opportunities for English learners' meaning-making with text, some of these practices may help teachers translate a linguistic orientation to meaning-making into a pedagogy.

CHAPTER 6: UNIT 3 – BUILDING CONCEPTUAL UNDERSTANDING WITH INFORMATIONAL SCIENCE TEXT

Introduction

In the previous two findings chapters, I investigated the instructional practices, opportunities, and challenges that were revealed in Ms. Youssef's enactment of the curricular units designed to support students' analyses of characters in narrative fiction. In this chapter, I will explore the instructional practices, opportunities, and challenges that were revealed in Ms. Youssef's enactment of Unit 3, which was designed to support students' comprehension of the ideas and concepts presented in an informational science text: *Electricity: What Is It and Who Invented It?* (Palincsar, 2012). In this study of Ms. Youssef's enactment of Unit 3, I sought to address the following question: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific teaching practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with informational science text?

I begin this chapter by contextualizing my study of Unit 3 in the current Next Generation Science Standards (National Research Council, 2012) that support a linguistic orientation to meaning-making in the discipline of science. Next, I briefly describe the data sources and data collection for this unit of study, followed by a description of the written curriculum for Unit 3. Then, I present the findings. I identify the instructional practices Ms. Youssef used to facilitate students' conceptual understanding and analysis of informational text. Subsequently, I illustrate and discuss the opportunities for meaning-making that arose as a result of Ms. Youssef's

enactment of Unit 3. Additionally, I discuss the challenges that were revealed in Ms. Youssef's enactment of this curriculum. I conclude with a summary of the findings and instructional implications.

Learning Science and The Language of Science

When learning science, students are expected to apply science and engineering practices (e.g., asking questions and defining problems, developing and using models) and crosscutting concepts across a range of disciplinary core ideas (Lee, Miller, & Januszyk, 2014; National Research Council, 2012). Lee, Quinn and Valdez (2014) explain the intersection of science content learning and language learning in the Next Generation Science Standards:

> Engagement in any of the science and engineering practices involves both scientific sense-making and language use. The practices intertwine with one another in the sense-making process, which is a key endeavor that helps students transition from their naïve conceptions about the world to more scientifically based conceptions. […] Second, these practices are language intensive and require students to engage in classroom science discourse. Students must read, write, view and visually represent as they develop their models and explanations. (p. 224)

Teaching and learning science not only involve *doing* science but also reading about science concepts. Constructing scientific understanding requires interpreting the language of science. The technical vocabulary, abstract concepts and complex linguistic features characteristic of informational science texts pose unique challenges for readers (Fang & Schleppegrell, 2008). In the upper elementary grades and beyond, science texts are typically laden with technical vocabulary. Many phenomena and scientific processes are abstract; this abstraction coupled with a lack of familiarity with the concepts can be challenging for readers of

science texts to navigate. Furthermore, authors of science texts often present information using linguistically dense, complex clauses (e.g., nominalization). These linguistic challenges specific to informational science texts are amplified for English learners (Lee, Quinn, & Valdés, 2014). With a linguistic orientation to meaning-making with informational science texts, teachers can become aware of the linguistic challenges specific to the genre and adopt tools and practices that teach English learners how to navigate these challenges.

In the younger grades, authors of science texts often use the narrative genre in attempt to make the concepts more accessible and engaging for readers (Cervetti et al., 2009). In addition to the fact that narrative texts are not easier for English learners, there are several risks in presenting science through the narrative genre. The assumption that, in order to be engaged in learning, students need to be entertained by narratives is false. Given the choice between reading about a particular topic or reading a particular genre, students demonstrate a preference of topic over genre (Cervetti et al., 2009). Furthermore, fictionalizing science concepts can lead to the anthropomorphizing of nonhuman phenomena, which can lead to misconceptions. Students of all ages and levels of English proficiency need to have frequent and wide exposure to informational texts because informational texts are used for learning and teaching about the world (Duke, 2004). From the earliest grades onward, students need to become familiar with informational texts and their complexities.

In the language arts classroom, text-based discussions with science texts provide the context in which the teacher and the students can co-construct scientific knowledge as they work with the ideas presented in the texts, especially if those discussions include opportunities for students to draw, write and engage in hands-on activities that reinforce the concepts in the text. Informed by cognitive (Kintsch, 1998), sociocultural (Vygotsky, 1978) and sociolinguistic

theories (Halliday, 1978), the written Language and Meaning curriculum for Unit 3 provided such opportunities for reading science text, discussing science concepts, building models and representations of concepts, and using scientific language. All of these forms of engagement were realized in Ms. Youssef's enacted curriculum as language-intensive opportunities for meaning-making.

Data Collection: Unit 3

For this unit in the Language and Meaning curriculum, Annemarie Palincsar authored original texts about scientific concepts. Each of the four texts, one for each grade level for grades 2 through 5, was tailored to the district science standards and grade level expectations for the respective grades. The accompanying curricular units were designed to support students' reading comprehension (i.e., understanding of the science concepts presented in the texts) and language development.

In January of 2013, Annemarie piloted the Unit 3 curriculum in a third grade classroom at one of our participating schools. After we studied the pilot data and revised the curricular materials, the Language and Meaning research team and the participating teachers and literacy coaches gathered together for the third professional development institute of the year on the first of February.

One month later in March of 2013, Ms. Youssef implemented Unit 3 in her fourth-grade classroom, which occurred over the course of two weeks. I drew upon several data sources specific to Ms. Youssef's enactment of Unit 3: classroom video and audio of all six lessons, observation field notes, and Ms. Youssef's reflection log.

The Written Curriculum: Unit 3

Unit 3 was designed to support students' comprehension of the ideas and concepts

presented in an informational science text. The fourth-grade Unit 3 text, *Electricity: What Is It*

and Who Invented It? (Palincsar, 2012), explained the concept of electricity and provided some

historical background on the scientists who invented it, made it accessible to the general public,

and profited from the entrepreneurship. The curriculum that accompanied the text was similar to

the curriculum in Units 1 and 2 in that the lessons provided teachers with materials, suggested

procedures, and instructional dialogue to be used in whole class, text-based discussions with

students. Functional grammar analysis was embedded into the lessons as an approach to help

students understand how the language in the text communicated the science concepts and the

author's purpose. The fourth-grade lessons were designed to aid teachers and students in their

use of previously learned metalanguage (*participant* and *process*) and new metalanguage

(*author's attitude* introduced in Lesson 1 and *connectors* introduced in Lesson 6) in the service

of meaning-making with informational text (see Figure 6.1).

Metalanguage	Lesson introduced	Purpose
Participant, author attitude	1	To review participants and introduce author attitude
Participant, process	2	To use these features to make sense of the text
Participant, process	3	To use these features to make sense of the text's description of a simple circuit
Connectors	6	To learn about the role of connectors in signaling something surprising or unexpected or to identify conditions

Figure 6.1. Functional grammar metalanguage in Unit 3, Grade 4 (Schleppegrell, 2014).

The written curriculum for Unit 3 consisted of six lessons. The first lesson introduced the

genre of informational text and provided a preview of the electricity text, which was divided into

five sections: Introduction, Electrons in the Atom, Inventing the Battery, Inventing the Light

Bulb, Making Electric Current Practical. The lessons corresponded with the sections of text. Also in Lesson 1, the metalanguage of *author's attitude* was introduced to draw students' attention to the ways authors use language to engage the reader or implicitly express opinions. In the second lesson, the teacher and students read the section about atoms and drew an image of an atom. In Lesson 3, the teacher and students read the section about batteries and drew a picture of a battery. In Lesson 4, the teacher and students finished reading the text and summarized sections of it. In Lesson 5, the teacher and students revisited the section on batteries and circuits, and in small groups, students built a simple circuit using materials we provided along with the curriculum. In the final lesson, the teacher and students revisited the text once again to understand how authors use *connectors* to link ideas or signal unexpected information. Pre- and posttest measures of content knowledge (multiple choice and independent writing) were administered by the classroom teacher at the beginning and end of the unit. Over the course of six lessons, this unit was designed to support teachers and students' reading of the text through text-based discussions while concomitantly providing opportunities for hands-on experiences. (For the complete text and unit outline, see Appendix A. To view the complete curriculum, go to functionalgrammar.org and follow the links to Unit 3, 4th grade.)

Findings

As defined by the written curriculum, teaching for meaning-making with informational science text consisted of using interactive read-alouds, informed by functional grammar, and the student's creation of visual representations to co-construct conceptual understanding. The functional grammar analysis embedded in the lessons served as an instructional tool with which Ms. Youssef could help students notice particular language features in the text and their meanings during the interactive read-aloud. In the text for Unit 3, the *participants* were scientific

phenomena pertaining to electricity (e.g., atom, nucleus, proton, neutrons, conductors, insulators) and the *processes* communicated the relationships among the participants. *Connectors* were used to link ideas or alert the reader, and *author's attitude* was interspersed throughout the text communicating the author's perspective or opinion.

In the classroom video data of Unit 3, there were a total of 53 text-based instructional episodes across six lessons. Out of the 53 text-based instructional episodes in Unit 3, Ms. Youssef used functional grammar metalanguage to support her students' meaning-making in 35 episodes. In 19 episodes, functional grammar was used as a tool to support students' construction of conceptual knowledge (e.g., the language of *participants* and *processes* was used to talk about the parts of an atom). In 16 episodes, Ms. Youssef used functional grammar to bring explicit attention to the language in the text (e.g., how authors use *connectors* to link ideas or alert the reader). She also used functional grammar in discussions about author's craft, which occurred within instances of explicit attention to the language in the text *and* instances of building conceptual understanding. (See Table 6.1.)

In 18 of the 53 text-based instructional episodes in Unit 3, Ms. Youssef supported her students' meaning-making *without* using functional grammar. In these episodes, she asked students to draw upon knowledge of previously read text, connect the text to the hands-on experience of building a simple circuit, and reread the text with the students for the purpose of building conceptual understanding. In several of these episodes, she assessed student' understanding through listening to their small group conversations or, in one instance, a quick paper and pencil quiz in which they were asked to label a simple circuit and compare the ones they had built to illustrations of other simple circuits, some of which were short circuits. In 4 of these 18 episodes, she targeted the building of knowledge about the genre or specific vocabulary.

In these isolated instances of direct instruction about genre or vocabulary, Ms. Youssef modeled,

demonstrated or provided information to the students.

Table 6.1 *Unit 3 Instructional Categories and Episodes*

Unit 3	
Instructional Categories	**Number of occurrences**
With FG	
Building conceptual understanding using functional grammar metalanguage	19
Explicit attention to language using functional grammar	16
Without FG	
Building conceptual understanding without using functional grammar	14
Explicit instruction of vocabulary, genre, or attention to language without the use of functional grammar	4

The table above shows the distribution of episodes as they were organized into categories

based on the focus of instruction at the level of an instructional episode and Ms. Youssef's use of

functional grammar analysis during the episode. Throughout these episodes, her enactment of the

curriculum revealed both opportunities and challenges. Next, I will turn to describing the

instructional practices Ms. Youssef used in her enactment of Unit 3. Subsequently, I will use key

episodes to illustrate the following opportunities for meaning-making: the construction of

conceptual knowledge using functional grammar, explicit attention to language in the text with

functional grammar, and studying author's craft to support comprehension. Then, I will discuss

some of the teaching challenges that arose relative to navigating the language in science texts.

As in the previous units, in the transcription of episodes, I used traditional orthography

(e.g., punctuation, spelling, capitalization) and several additional transcription conventions. I

used words in all CAPITALS to indicate a word that was emphasized in the speech; a forward

slash "/" to indicate multiple student responses that occurred in one turn; and brackets "[ ]" to indicate overlapping speech. I also maintained the speakers' grammar, including any infelicities resulting from nonnative English discourse.

Instructional Practices

As in the other units, the instructional practices Ms. Youssef used in Unit 3 consisted of the observable ways in which she used, modified and supplemented the *written curriculum* to transform it into an *enacted curriculum.* These practices can be characterized as *participation structures* (e.g., whole class, pair share, small group work), *instructional techniques* (e.g., shared reading, role play, think-aloud, explicit instruction, modeling, iterative readings of text, interactive read aloud, embedded vocabulary instruction, connecting hands-on experiences with text, functional grammar analysis) and *discourse moves* (e.g., elicitations, recasting, revoicing, extending, translating instruction into students' native language).

To illustrate the nested nature of Ms. Youssef's instructional practices, their variation in grain size, and the ways in which Ms. Youssef used them both deliberately and opportunistically, I have provided a detailed account of one 60 minute lesson in its entirety with pieces of transcription embedded into the narrative description of this lesson. This allows for a holistic portrayal of these practices' contextualized and interconnected nature. In Unit 3, most practices—with the exception of a few questions in the *Creating a Visual* section—were not specified in the written curriculum, but instead were the result of the interaction among the teacher, the teacher's preparation for teaching, her decision making, the students' learning needs and contributions, the text and the curricular materials (Remillard, 2005).

I divided the analysis of the instructional practices in Lesson 3 into five parts: preparation for learning, small-group discussion, interactive read-aloud, creating a visual, and the summary.

In each section, Ms. Youssef employed a variety of practices that enabled students' engagement with the scientific concepts and understanding of the text.

Preparation for learning.

In Lesson 3 of Unit 3, Ms. Youssef began the lesson by reviewing what the students had learned in the two preceding lessons (e.g., features and purposes of informational text, the meaning of the word *invent*, the origin of the word *electricity*, the structure of an atom). She asked the students to reread (skim) the introduction and the first section, *Electrons in the Atom*, on their own so they could summarize what they had discussed in lessons one and two. After eliciting a summary of the key points from the students, she gathered the students together on the floor in the front of the room and introduced the objectives for lesson three. These objectives, like the objectives in her other lessons, were worded slightly differently than those in the written lesson plan. The objectives as written in the lesson plan said, "Students will focus on the section of the text that discusses batteries. Using FG features of participants and processes, students will make sense of the text and draw an image to support their comprehension." Although I never asked her about why she adjusted the wording, we might assume she did so to make the objectives more accessible for her students.

She read the lesson objective aloud as the students followed along, "Objective: Students will read two paragraphs about inventing the battery and look closely at chunks to draw a picture of a battery to develop a better understanding of how an electric current flows in a battery." She paused along the way to clarify the word "chunks" as "meaningful groups of words," which was necessary because several students understandably thought "chunks" meant syllables. "Chunking" is a strategy for decoding multisyllabic words, but in the Language and Meaning curriculum, finding "meaningful chunks" meant finding the groups of words that communicated

whole ideas, such as the *process* "figured out how to make large numbers of light bulbs." Ms. Youssef's vigilant attention to students' understanding at the word level, the metacognitive level and the macro level of reading and interpreting texts was not limited to the text that accompanied the unit. Every text—written or spoken—in the classroom was treated as an opportunity for meaning-making or meaning breaking down. She remained vigilant in every step of her instruction, clarifying word meaning even in the objectives, to ensure meaning was being made to avoid potential breakdowns.

She continued preparing the students for the lesson by talking about the objectives. She asked the students to recall what they had drawn the day before. Many students raised their hands and she called on one, "We drew the atoms and—" and she confirmed that they had drawn the atoms and the nucleus. "Today, we are going to read how the battery was invented and what is inside the battery and we are going to draw a picture of that." Then she asked her students why it would be helpful to draw. A student said, "To have a better understanding." Ms. Youssef replied affirmatively and added, "and to have a better understanding, I am going to look at *participants* and *processes*. When I read a sentence, I want you to focus on *who* is involved in that sentence." In this last direction, before the students transitioned from the floor to their seats, she incorporated the use of the functional grammar metalanguage into the plan as well.

The preparation for learning was conducted through a whole-class, explicit instruction format, which began with students at their desks and ended with all of the students gathered on the floor in the front of the room. In the written lesson plan, the lesson objectives included a review of previous material but how to enact this review was not specified. Ms. Youssef began by connecting students' prior learning with the learning ahead. She gave students the opportunity to revisit the text by asking them to skim the sections they had read in Lessons 1 and 2. Then she

made the objectives for Lesson 3 explicit; they were written on the board, and she engaged the whole class in reading them aloud along with her. Upon referring to the written curriculum, it was evident she had modified the objectives to foreground what students were expected to *do* with the information in the text. She aimed to ensure students understood the objectives by checking for understanding through asking them about word meaning and taking the time to elicit their ideas before clarifying. This evidence suggests she anticipates students' thinking and challenges. After discussing the objectives, which included drawing the battery, she asked her students to explain why it would be helpful to draw. This kind of question encourages students to think about the purpose of a task.

She closed this section of the lesson by reminding students that she wanted them to focus on the *participants* and the *processes* in the sentences they were going to read. This focus on participants and processes had been included the written lesson plan's objectives; step one in the procedures suggested a more thorough discussion about how identifying complex participants, and the processes around them, can be helpful when reading and working to understand text. Although Ms. Youssef did not include participants and processes in her written objectives or provide an explicit review of participants and processes as a discrete procedure in her instruction, she incorporated this functional grammar metalanguage into the spoken directions after the students' task and its purpose had been established.

Small-group discussions followed by sharing ideas.

The preparation was followed by a few minutes of a hands-on exploration of a battery. She gave batteries to students at their desks and asked them to make observations about the batteries and discuss the observations at their table groups. She then elicited a few of the students' ideas about the batteries in a whole group discussion. This sharing took only two

minutes. During this time, she called on 3 different students, and with each one, she probed for reasoning and revoiced the student's contribution but she never once evaluated a student's idea.

In the written lesson plan, step two in the procedures read, "Pass around the batteries to get the students thinking about how they might work." Ms. Youssef used the hands-on exploration of a battery as an opportunity for small group discussions, which encouraged students' language use and idea generation. The small group discussions were followed by two minutes of sharing out to the whole class. She prefaced the sharing with saying, "I would like to hear about what you were discussing. Do not worry about correct information." She called on three different students to share. Her emphasis on the ideas, not the accuracy of them, provided a risk free environment for students to share their thinking. It is important to note moments such as these because in many other parts of the lesson, Ms. Youssef did emphasize the importance of generating information precisely as it was worded in the text for the purposes of understanding the content. But as is evident in this section of the lesson, she makes space for students to use language in exchanges with one another and generate ideas of their own as well.

Interactive read-aloud.

Then she had the students turn to the section in the text they would read this day. Before they began, she reminded them to look for meaningful chunks. With the text projected on the Promethean board, she read aloud the section under the heading, *Inventing the Battery*, while the students followed along by reading their copies of the text at their seats.

Inventing the Battery

Count Alessandro Volta, who lived in Italy, invented the first battery in the 18th century. He called it a "voltaic pile." It consisted of a pile of zinc and silver or copper discs separated by pads in an acid solution. The acid allowed the electrons in the metals to travel even more freely, creating an **electric current**. An electric current is the flow of electricity through a conductor.

She paused after reading the first paragraph and asked, "What do we recall about conductors?" Hands went up immediately but she continued to reiterate and reframe her question. "What do we recall about conductors? How do I know a metal is a good conductor?" More hands went up along with "ooing" and the waving of hands, desperate to be called on, but she continued to reframe the question to get everyone in the room thinking. "What should happen in order for that metal to be a good conductor?" The following discussion ensued.

Interactive read-aloud: *Inventing the Battery*
(Source: Unit 3, Lesson 3, 24:35-34:46)

1. S1: It would be a good conductor if, metal can go through fire.

2. T: What makes that matter a good conductor?

3. S2: The particles have to move freely.

4. T: What type of particles? Which part of the atom has to move freely?

5. S2: Electrons.

6. T: Electrons have to move freely. What part of the atom will make it an insulator?

7. S3: When the electrons are all stuck together and cannot move freely.

8. T: It is the same part...the electrons. However, they are stuck together; they stay together. So, right now, I would like you to read this paragraph silently on your own. Quickly.

> Above, Ms. Youssef embeds a quick review of previously learned vocabulary. Eliciting student ideas, she is able to assess their understanding and review the vocabulary at the same time.

9. Ss: (Rereading sub-vocally).

10. T: Children, let's look closely. "Count Alessandro Volta" That's a person...where did he come from?

11. Ss: Italy.

12. T: From Italy. Italy is in Europe. What did this person **DO**?

13. Ss: Invented the first battery in the 18th century.

14. T: So, he invented the first battery in the 18th century. He called it what?

15. Ss: Voltaic pile.

16. T: When you are piling something, you are putting things on top of each other. (Ms. Youssef demonstrates piling a stack of papers. She then stacks a pile of books one on top of the other.) So, let's start seeing the mental image in our heads. Together… (reading) "It consisted of a pile of zinc and silver or copper discs." Let me stop here and let me think about the process here and who is participating. (rereading) Voltaic pile. It consisted of a pile. Who^2 is "it" here? (Repeats the question in Arabic and rereads the same portion of text in Arabic) So, my question is, who is "it"?

17. S4: The voltaic pile.

18. T: The voltaic pile, which is the battery. Do you agree (addressing the class)?

19. Ss: Yes!

20. T: Yes! I agree. "It" is the battery. Wonderful. Let's continue reading.

> In the section above, the students read the text again on their own and now they are engaged in their third reading of the text through an interactive read aloud with Ms. Youssef. She uses a visual demonstration of "piling" to reinforce new vocabulary; she uses the functional grammar metalanguage to help students track the referent "it" and she translated the text and her question into Arabic.

21. T: (rereading) Consisted of a pile of these metals; zinc and silver or copper disks. Do you notice that these are all metals? What is going on here? Who is talking to you? Who is talking to you? Who is talking to you?

22. S5: The person who wrote about it.

23. T: And what do I call the person who wrote about it? What do we call the person who wrote the selection?

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^{2} Ms. Youssef consistently refers to the participants in this informational text as "who" while typically in these examples, they would be referred to using "what." In Arabic, these pronouns do not take different forms based on the human/non-human distinction.

24. S6: The author.

25. T: The author…

> Ms. Youssef raises awareness of the author.

26. T: (rereads) "Separated by pads in an acid solution." What's a solution? What's a solution?

27. S7: Something that solves the problem.

28. T: Something that solves the problem. Yes! Because we have learned that, when we write, that at the end of the story, we need a solution or…

29. Ss: Conclusion.

30. T: Or?

31. Ss: Evaluation.

32. T: Or? Outcome. However, solution here is a bit different. Solution is liquid that has some kind of chemicals in it. (Ms. Youssef then makes a salt-water solution, by adding table salt to a container of water and mixing) This water became a—? Solution. Solution. So, solution has several meanings. In this selection, solution is the acid. It is a liquid that has chemicals in it and we call it…

33. Ss: Acid solution.

> In the section above, Ms. Youssef makes new vocabulary concrete by creating a visual demonstration and drawing upon other meanings of the word from other contexts.

34. T: Now. Read.

35. Ss: (reading) "The acid allowed the electrons in the metals to travel even more freely."

36. T: Who are the participants? Who is doing the work? Who is involved?

37. S8: Acid.

38. T: The acid is a participant. Who else?

39. S9: The electrons.

40. T: The electrons. Who else?

41. S10: The metal?

42. T: The metal. Anything else? Okay. What is the process here?

43. Ss: Allow

44. T: Allow…so, let's read… The acid is doing what?

45. Ss: Allow.

46. T: Allowing WHO?

47. Ss: Electrons! To travel even more freely.

She uses the functional grammar metalanguage to help students dissect the sentence to better understand what's occurring inside the battery.

48. T: Continue reading.

49. Ss: [reading] "creating an **electric current"**

50. T: And what did we learn about informational text. You are reading and you find these bold, dark, big vocabulary words. Why?

51. S11: It's a new word.

52. T: It's a new word. So, what do we need to pay attention to?

53. S11: What it means.

54. T: Let's continue reading and see if the author provides that.

55. T & Ss: (reading) "An electric current is the flow of electricity through a conductor."

56. T: Did the author provide the definition of a current?

57. Ss: YES!

58. T: Where is it? Say it out loud.

59. Ss: An electric current is the flow of electricity through a conductor.

60. T: Are you ready to draw the battery?

61. Ss: Yes!

62. T: Let's see.

Ms. Youssef primarily used a whole-class participation structure during the interactive read-loud with embedded opportunities for students to read the text independently and together. The written lesson plan had suggested teachers read the two paragraphs with their students and then engage their students in constructing the drawing of the battery. Throughout this section of the lesson, Ms. Youssef and her students read just the first paragraph three times and each sentence in the paragraph multiple times during moments of word and sentence level analysis. Translating the text and her questions into Arabic at key points during the reading encouraged the newcomers' engagement and involvement. She began by reminding her students to look for the meaningful chunks.

She read the text to the students as they followed along. At the end of reading the first paragraph, she stopped to ask students to recall the meaning of *conductor*, a word they had learned in the previous lesson. She reiterated the question four different ways providing ample time for students to think about what she was asking (lines 1-6). The reframing may also have allowed students at varying degrees of English proficiency to grasp her question (Larsen-Freeman, 2012). She provided a review of previously learned vocabulary by eliciting the word's meaning from the students and using student contributions to expand the definition so it encompassed other previously learned material (lines 14-16). This review and "collecting" of ideas served as an assessment, and it also served to reinforce both the vocabulary as well as the content needed for the construction of logical relations (Van den Broek & Kremer, 2000). For new vocabulary, she provided redundancy through demonstrating the word visually in several

ways, rereading the word in the clause multiple times, and eliciting other meanings of the words from other contexts (Beck, McKeown, & Kucan, 2013) (lines 26-33).

During the interactive read-aloud, Ms. Youssef embedded functional grammar analysis as a tool for discussing what Count Volta *did* (eliciting the doing process) and helping students construct referential relations (Van den Broek & Kremer, 2000) by asking who is "it" (eliciting the participant). When trying to understand the sentence, "The acid allowed the electrons in the metals to travel even more freely," Ms. Youssef explicitly asked, "Who are the participants? Who is doing the work? Who is involved?" (line 36). Once this was determined, she asked the students to identify the process (line 42). A quick 13 turns at talk generated the identification of the participants and the processes, which reinforced the role the acid was playing in the battery.

Creating a visual representation of the information in the text.

Following the discussion above, Ms. Youssef gave her students a blank piece of paper on which to draw the battery. Before they started, she explicitly stated the meaning-making process in which they were engaging. "First we read, we make a mental image (pointing to her head) and then we move the mental image into drawing." She held up the battery and said to the class, "Here is a battery. What shape do you think I should draw?"

A student replied, "A cylinder."

"A cylinder," she confirmed, moving toward the board to model the drawing, labeling the diagram along the way.

After they drew a cylinder, she took her students back to the text to reread it again, asking them to reread it aloud with her. This is the fourth time they had read the text. Pausing after the sentence with the word "discs" in it, she held up a CD and said, "This is a disc. It doesn't have to be a CD but this a shape of a disc. So if he is making a pile (she grabbed the rod she uses to point

at the blackboard and began sliding the discs onto the rod, piling discs one on top of the other), he is making a pile of discs." Then she took her students back to the text again to reread and emphasize the phrase "separated by pads in a acid solution," and she asked her students to explain what that phrase meant. "Looking at the text," she reminded them "don't look at the walls." A student replied that he was separating the discs with pads, which was the answer Ms. Youssef was seeking. So she removed the discs from the rod and began stacking them again, alternating with placing a tissue (a pad) between each disc. "I'm helping my brain understand what's going on," she said, explaining why she was doing this demonstration. She not only provided a demonstration which gave the students a concrete visual of the interior of a battery, but she thought-aloud about why she was doing so.

Returning to the text, they reread that same sentence and this time they focused on the acid solution. She asked her students, "Then what did he do?" Students had difficulty answering this question. So she went back to drawing the discs and pads first. She elicited what she should draw from the students. Many students spoke at once, restating the text "pile of zinc and /or silver or copper."

She continued to push their thinking, "Where do I put the pile?"

Various students spoke again, "In the battery."

"Why in the battery?" she asked. "What does it say here?"

Students struggled with pronouncing the word, but they eventually suggested "consisted," which was what she was looking for. She engaged students in co-constructing the drawing with her, requiring that they extract the information directly from the text.

"So consisted means it was contained inside," she explained. "So let's start drawing the discs and pads. Draw the discs separated by pads." As Ms. Youssef modeled drawing the discs

and pads on the board, students drew at their desks. Then she asked, "What else? What's inside the battery?"

Various students mumbled, "Electricity…CDs…"

"These (pointing to the discs she drew on the board) are made of what?" she asked.

"Zinc!" a student said.

"Zinc, silver or—?" she elicited.

"Copper," the students replied.

"So they are the metals and we have the pads and we need to do what to remember, label," she said as she picked up her marker to model labeling the discs and pads. "What else is inside the battery? Go back to the reading. What else? Who is participating? Who is involved?"

"Acid," a student said.

"Acid –?" she replied. "Complete chunk," she elicited.

"Acid solution," the same student offered.

"Where do I draw the acid solution?" she asked.

Many students offered ideas: inside the pads, inside the discs, and one small voice said inside the battery.

"Inside the disc? How can I put it inside the disc, what do you mean? Where is the disc? Where are the discs?" she probed. She called on a student.

"Inside" the student said quietly.

"Inside what?" Ms. Youssef probed.

"The battery," the child said.

"Inside the battery. And I just explained, just showed you an example of a solution. So where do I put the solution?" she asked. Only a few students raised their hands. This was clearly

confusing for most of them. So she went back to the text and told the students to read along with her.

"It – who is it?" she paused and asked.

"The battery!" the students said.

"Consisted – contains – a pile of zinc, silver and/or copper separated by the pads INNN – look at that word IN what? In an acid solution." So where do I pour the acid solution?

"Innnn…Inside the discs," students suggested.

"Inside the battery," she clarified and went to draw it on the board as students added the acid solution to their drawings as well.

Throughout this section of the lesson, Ms. Youssef modeled and co-constructed a drawing of the battery with her students. She maintained her focus on the information in the text and consistently insisted her students do the same. Comparing her enactment to this section in the written lesson plan, it appears that she used many of the suggested questions in the plan to elicit student thinking during this activity. She made additional moves that further reinforced this learning opportunity for the students.

Ms. Youssef began with a fourth reading of the first paragraph. She revisited new vocabulary with elaborated demonstrations of the words, such as the piling of the *discs* on the pointer, separated by *pads*, and concocting a saltwater solution to illustrate the meaning of the word *solution*. At several points throughout this section, she thought-aloud about what she was doing and why she was doing it. Her think-alouds provided a metadiscourse that pointed to the purpose of particular activities. She modeled drawing the battery for the students in incremental steps as she and her students toggled between reading the text, discussing it and drawing the

parts of the battery, persevering in the discussion until they appeared to have achieved a clear understanding of the concept.

Summarizing.

In the last five minutes of the lesson, Ms. Youssef asked the students a series of questions. After each question, a student answered and with no evaluation of the student's answer, she followed up with another question. Notice the way she uses students' input to generate the next question.

Summarizing the learning
(Source: Unit 3, Lesson 3, 52:42-57:30)

T: What is an electric current?

S1: An electric current is the flow of electricity through a conductor.

T: Yesterday, what did we learn about conductors?

S2: That they are good conductors.

T: What does that mean?

S3: Something that is metal [xxx].

T: What makes them good conductors?

S4: What makes them good conductors is when electrons move freely.

T: Yes! When electrons move freely they become good conductors. Do you think the electrons are moving freely in this battery?

Ss: Yes.

T: Why because of what?

S5: Because it's a good conductor.

T: Why is it a good conductor?

S6: Because electrons are moving freely.

T: Why are they moving freely?

S7: Because it's made of metal.

T: It's made of metal and what else? What did we put inside the battery (pointing to her drawing)?

S8: The discs.

T: The discs, the pads, and—?

Ss: The acid solution.

T: If I put these discs made of glass or plastic inside the battery, what will happen? (She translated this question into Arabic, asked the students to use scientific words to explain their thinking and talk to one another. She listened to the students as they discussed. Speaking to Hassan:) Did you see how you explained it to him in a wonderful way? I want you to say that out loud. Let's listen to Hassan.

S9: It's not going to be a conductor because with metal, the electrons move freely.

T: And if I replace them with glass what will happen to the electrons?

S10: They will stay in the same place.

T: And if they don't move freely, what happens?

S10: It doesn't work.

T: Why wouldn't the battery work? What does the disc become? Instead of a conductor it becomes an—?

Ss: Insulator!

At the end of the lesson, she acknowledged to her students how much they had learned and how much she had to elicit from them. She asked several students to share what they thought was the coolest part of the lesson. One mentioned learning that batteries have acid inside of them. She finished the lesson by cautioning them not to play with batteries at home or try to open them because the acid solution can burn their fingers; it's a harmful chemical.

It is well known that summarizing learning can help students synthesize and recall what they just learned (Palincsar & Brown, 1984). Although not suggested in the written lesson plan, Ms. Youssef took just five minutes to reinforce and review the concepts learned in this lesson. She used a series of questions, each of which built upon the students' input. Some could argue that she is only asking display questions and that children's turns need to be extended to support greater idea generation and language development (Chinn et al., 2001; Nystrand, 2006). However, contingent questioning has been shown to be an effective means for structuring discussions and promoting talk with English learners (Boyd & Rubin, 2006). Her questions not only invite students to participate, but they imply that learning the material and understanding the text is the most important task at hand. In this one section of the lesson, which only lasted five minutes, she called on ten different students and many more participated in choral responses to her questions.

With the last question of the summary, she translated it into Arabic to include everyone in the final thought, provided an opportunity for students to turn and talk to one another, and asked students to use scientific language in their conversations. Even at the tail end of the lesson, when it can be assumed that Ms. Youssef and her students were tired, considering the cognitive and linguistic demands of the lesson and the text, Ms. Youssef remained vigilant about every student being involved, learning, engaging with each other and the ideas presented in the text.

Summary of instructional practices.

In the lesson analyzed above, which typifies many of the lessons across Unit 3, Ms. Youssef employed an array of practices to support students' construction of meaning with the text, *Electricity: What Is It and Who Invented It?* (Palincsar, 2012). With various types of questions and elicitations of students' thinking, Ms. Youssef used discourse moves to assess

students' understanding, build conceptual ideas, and direct students' attention to the language and meaning in the text. Once the participants were identified—*acid*, *electrons*, *metal*, *electric current*—Ms. Youssef and her students discussed the processes that connect them: the acid solution *allows* the electrons in the metals *to travel more freely*, thereby *creating* an electric current. With iterative readings of the text, shared reading, explicit vocabulary instruction, demonstrations and modeling, Ms. Youssef reinforced students' language learning and conceptual understanding. With both whole class and small group discussions as the foundation for these other practices, Ms. Youssef gave every student in the class multiple opportunities to learn from her and one another.

Ms. Youssef's enacted curriculum reflects the original written lesson plan but deviates from it in important ways. She rephrased the objectives and made them explicit for students; she fleshed out bulleted items in the lesson plan into thoughtful instructional episodes; she added more opportunities for readings of the text; she repeated and reframed questions to provide greater access for more students; she responded to students' contributions during discussions and used their thinking to guide her questioning; and she summarized what had been learned with her students. The combination of her flexibility with the written lesson plan and her strict adherence to the text enabled her to address the linguistic and cognitive learning needs of her students. It was evident that the functional grammar analysis was one of many tools she used in a repertoire of practices. That being said, it was a unique tool as the metalanguage of participants and processes enabled students to identify and discuss the scientific concepts as process-based phenomena in relationship to one another. Identifying and analyzing Ms. Youssef's instructional practices provides a window into the various ways in which she facilitated text-based

discussions, responded to students' contributions and responses, and worked to ensure students understood the concept of electricity and who invented it.

Opportunities for Meaning-Making with Functional Grammar

Ms. Youssef's enactment of Unit 3 illustrates how a teacher can use functional grammar metalanguage as a resource when scaffolding English learners' construction of logical and referential relations (Van den Broek & Kremer, 2000) with informational text. Throughout the unit, there were multiple instances during which Ms. Youssef lingered on specific segments of text to 1) focus the students' attention on particular words and their local meaning, and 2) connect those local word meanings and ideas to the overall conceptual understanding under construction.

The construction of conceptual knowledge with functional grammar.

With her use of the functional grammar metalanguage of *participants* and *processes*, Ms. Youssef emphasized which parts of the sentence were central to the conceptual understanding. Directing students' attention to the meaningful chunks in the text supports comprehension (Van den Broek & Kremer, 2000). This focus on language was coupled with Ms. Youssef's consistent reiteration of previously read material, which reinforced students' conceptual understanding, in particular, understanding of scientific processes. In the episodes below, both language learning and meaning-making were occurring simultaneously and fueling one another.

In Unit 3 Lesson 2, Ms. Youssef and her students read the following paragraph.

Electrons in the Atom

What are atoms made of? In the middle of each atom is a "**nucleus**." The nucleus contains two kinds of tiny particles, called **protons** and **neutrons**. Circling around the nucleus are even smaller particles called **electrons** (and now you know that this is a Greek word).

Prior to this instructional episode below, she and the students had drawn a picture of an atom: two concentric circles with the middle circle labeled "nucleus" containing "protons" and "neutrons." Ms. Youssef modeled this on the board while the students drew their own diagrams of an atom on a piece of paper at their desks. She and the students continued to toggle between reading the text and creating the visual in the episode below. The functional grammar metalanguage supported this work.

Even smaller particles called electrons
(Source: Unit 3, Lesson 2, 28:35-31:53)

1. T: Together.

2. T & Ss: "Circling around the nucleus are even smaller particles called **electrons** (and now you know this is a Greek word.)"

3. T: Which word is Greek? Yes. (calling on S1)

4. S1: Electrons.

5. T: Electrons. Where are the participants here? "Circling around the nucleus are even smaller particles called electrons." Who is participating in this sentence? Kamil.

6. S2: Smaller particles and electrons.

7. T: Smaller particles and electrons. Who else?

8. S3: The nucleus.

9. T: The nucleus. So if I want to draw electrons, children, where would I draw them? Look at the box. (Referring to the text box on their page.) Read and tell me. You did not read. (Speaking to students who raised their hands immediately.) Look at the box, read and then we transfer the image. Isa.

10. S4: Draw them in the nucleus.

11. T: OK, Isa said I will draw them in the nucleus. Who has something different than what Isa says. And why? Salma.

12. S5: You draw them in the proton and the neutron.

13. T: OK, Hadiya.

14. S6: Around the nucleus.

15. T: Why are you saying around the nucleus?

16. S6: It says circling around the nucleus.

17. T: Circling around the nucleus. Put your finger on the nucleus children. (They have drawings of atoms at their desks that they drew earlier. She models with the drawing on the board.) Put your finger on the nucleus. Now follow along with me while we are reading together. (She traces her finger in a circular motion on the drawing of an atom while they read aloud.)

18. T& Ss: "Circling around the nucleus are even smaller particles called electrons."

19. T: So where do I draw them?

20. Ss: Around the nucleus.

21. T: And what are they doing, what's the process here? What are the electrons—

22. S7: Moving around! Moving around.

23. T: Circling around. And what size are they?

24. Ss: Tiny.

25. T: Are they the same size as the protons and the neutrons?

26. Ss: No.

27. S8: Tinier!

28. T: How do you know it's tinier?

29. Ss: Because it says.

30. T: It says what?

31. S9: Even smaller particles.

32. T: Even SMALLER particles. So I am going to make smaller particles here (drawing them on the board in the place where she had been using her finger to trace the circle around the nucleus) several dots because they said particles and those particles are doing what class?

33. Ss: Circling.

34. T: They are CIRCLING. They are circling. Traveling, circling around (she says as she draws them on the board). So they are circling. And label just one of them. And what are we going to label it?

35. S9: Electrons.

This episode revealed a close alignment between Ms. Youssef's enacted curriculum and the written lesson plan. To support students' conceptual understanding of the physical relationship between the electrons in an atom and the nucleus, Ms. Youssef used the text, functional grammar metalanguage of participants and processes, and a visual/kinesthetic reference. After reading the text excerpt together (lines 1 and 2), Ms. Youssef asked students to find the participants (lines 5 and 7). The students were able to identify the participants immediately (lines 6 and 8). She then referred back to the drawing of an atom and asked students to use the text to determine *where* the electrons should be drawn (line 9). She called on three students; the first two suggested drawing the electrons in the nucleus or in the protons and neutrons (lines 10 and 12). Ms. Youssef solicited additional ideas. S6 suggested drawing the electrons around the nucleus (line 14). At this point, Ms. Youssef pressed for the student's reasoning (line 15), and S6 supported her thinking with the language in the text (line 16). Ms. Youssef repeated what S6 had said, circling around the nucleus, and reiterated the text as well.

She then asked the students to return to the drawing, and using her finger, she began to trace a circle around the nucleus while she and the students read the sentence together again (line 17). She asked the whole class to reiterate where the electrons should be drawn (line 19), but she did not stop there. She used the functional grammar metalanguage of process to press for further

construction of meaning (line 21), and before she could even finish her sentence, S7 jumped in with his declaration (line 22). Again, she confirmed this student's contribution but continued to press for more nuanced understanding pertaining to the size of the electrons (lines 23 and 25). And once again, after S8 provided an accurate description, Ms. Youssef asked the student to justify his thinking (lines 28 and 30), which took the students back to the text.

Clearly anchored in the text and supported by the functional grammar metalanguage of participants and processes, this conversation enabled students to build upon what they had already drawn to create an image similar to the one that was provided in the curricular materials (below).
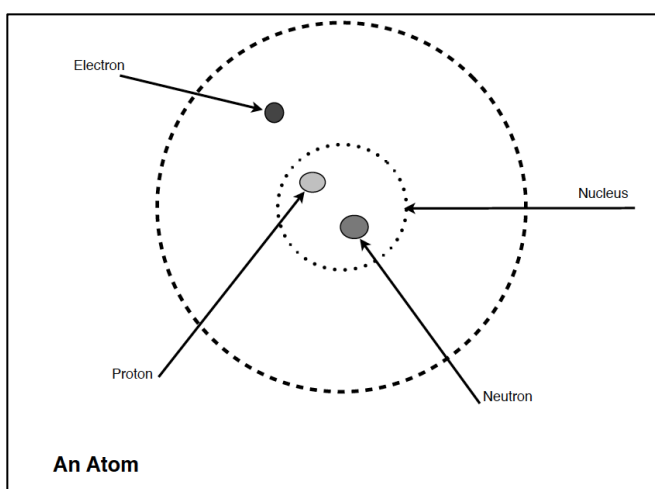
Figure 6.2. The diagram of an atom provided in Unit 3, Lesson 2.

As is illustrated by the episode above, the functional grammar metalanguage of *participants* and *processes* enabled Ms. Youssef and her students to talk about the language in the text. Questions such as, "Where are the participants here? Who is participating?" guided students in a systematic analysis of the sentence. The word *participant* implies an actor, someone or something engaged in an action. By using the functional grammar metalanguage of participants and processes, Ms. Youssef was able to directly and efficiently support students in

isolating the actors and the action in this sentence, and reinforce the understanding of the logical relations described.

The ease with which Ms. Youssef and her students toggled among the text, the functional metalanguage, and the construction of the visual suggests that this metalanguage had become part of the shared discourse in this classroom. She did not reframe her questions about participants or processes. Students were able to answer immediately, which indicates they understood the meaning of the metalanguage and the parts of the sentence it signaled. Compared with discourse in Units 1 and 2, it appears the students had become more accustomed to Ms. Youssef's use of the functional grammar by Unit 3.

Using functional grammar to summarize *who* did *what*.

The ways in which functional grammar had become integrated into the classroom's shared discourse was also evident in how Ms. Youssef used functional grammar in the context of teaching specific forms of meaning-making, such as summarization, and how she modified the lesson plan to incorporate a heuristic, a tree map, that was not specified in the curriculum. In Unit 3 Lesson 5, Ms. Youssef used a graphic organizer called a "tree map" as a tool for students to keep track of important ideas. Similar to the three-column organizer in Units 1 and 2, the tree map served as a scaffold for establishing causal and, in this unit, logical relations (Van den Broek & Kremer, 2000). She explicitly told students that the functional grammar metalanguage would help them summarize. She framed the functional grammar as a tool for accomplishing a specific kind of meaning-making—summarization—and in doing so, she made the purpose of functional grammar explicit. In the episode below, functional grammar served as a meaning-making tool to support the thinking she wanted students to do with informational text. The episode below illustrates that a "tree map" and its emphasis on participants and processes was

indeed helpful in co-constructing a summary of "who (participants) did what (processes)" in the history of the invention of electricity.

Inventing the Light Bulb

      An important way we use electricity today is to light our homes and communities. Many people think Thomas Edison invented the light bulb. But, in fact, a Canadian scientist named Henry Woodward was the first to develop the light bulb. Unfortunately, he did not have the money to make light bulbs after inventing them. He sold his idea to Thomas Edison, who was the first to figure out how to make large numbers of light bulbs available to the public. He made the light bulb practical and that is why we associate his name with light bulbs.

After an interactive read aloud of the paragraph above, Ms. Youssef gathered her students together in the front of the room to teach them how to use a "tree map" and functional grammar to summarize the important information. To illustrate how Ms. Youssef supported her students in constructing a summary, I have provided a complete transcript of this conversation. However, Ms. Youssef's use of functional grammar is implicit here. I have underlined the places in her discourse that suggest she is using her knowledge of participants, processes and the importance of meaningful chunks to structure this dialogue.

Tree map and FG help students track important ideas and summarize
(Source: Unit 3, Lesson 5, 7:53-18:16)

1. T: Let's take the important information from this selection. (The class rereads the paragraph together.) So, since I am focusing on scientists, <u>what are the two names of scientists</u> in this paragraph? Abdul?

2. S1: Thomas Edison and Henry Woodward.

3. T: (writing Thomas Edison on the chart). Why did I capitalize Thomas Edison's name? Isa.

4. S2: Because it's a proper name.

5. T: Because it's a proper name. Well done. What's the other name you said?

6. Ss: Henry Woodward.

7. T: Henry Woodward. I am going to put him here. (writing his name below Thomas Edison) I would like you to help me summarize the information here. What can I summarize about Thomas and what can I summarize about Henry? This is a very important part. If you are thinking about the participants and the process that they did, you should be able to help me summarize the important information about this gentleman and this gentleman - these two scientists. Mariam?

8. S3: Thomas Edison was the first one to invent the light bulb.

9. T: Go show me where did you find that information. Show me that supporting detail.

10. T & S3: (S3 pointing to the text as she reads it aloud) "Thomas Edison invented the light bulb."

11. T: OK, she said Thomas Edison invented the light bulb.

12. S4: She forgot an important detail.

13. T: What did she forget?

14. S4: That people think—

15. T: Go, show us.

16. S4: It says (pointing to the text as she reads it aloud), "Many people think Thomas Edison invented the light bulb."

17. T: Hm. So, did Thomas Edison invent the light bulb?

18. Ss: NO!

19. T: Why?

20. Ss: Because it says, "people think."

21. T: So, who invented the light bulb? Don't look at my face. We always go back and think about the selection. Hadiya?

22. S5: Henry Woodward invented the first light—

23. T: Prove it. Go (signaling for her to go to the board). Where are the words that show you he did?

24. S5: (pointing to the words as she reads them aloud) "But, in fact, a Canadian scientist named Henry Woodward was the first to develop the light bulb."

25. T: Ok she said in fact and Henry Woodward WAS. <u>What kind of word is "was</u>"? Was, is, are?

26. Ss: Nouns? Process! Action! Being!

27. T: <u>What kind of process</u>?

28. Ss: Being!

29. T: <u>It's a being. Well done</u>.

30. T: So, what can I summarize under each (returning to the graphic organizer). <u>This one</u> (referring to Henry Woodward) <u>did what</u>?

31. Ss: Made the first light bulb.

32. T: So he invented the light bulb. And <u>what did Thomas Edison do</u>? Go back (referring to the text). Did we find out the information yet?

33. Ss: No.

34. T: No, let's continue reading.

35. T &Ss: "Unfortunately, he did not have the money to make light bulbs after inventing them."

36. T: Talk to each other. <u>Who is he</u>? Which scientist did not have the money? Which scientist? (students discuss) <u>Which scientist did not have the money</u>?

37. S1: Henry Woodward.

38. T: Henry Woodward did not have enough money. So, I am going to say (writing on the tree map), "not enough money." What's another word for not enough?

39. Ss: Scarcity

40. T: Continue reading.

41. T& Ss: "Unfortunately, he did not have the money to make light bulbs after—?

42. Ss: —inventing them!"

43. T: So <u>what's happening here in this chunk right here</u>?

44. S6: When he invented them he didn't have that much money.

45. T: So another proof that he invented the light bulb. Continue.

46. T & Ss: "He sold his idea to Thomas Edison, who was the first to figure out how to make large numbers of light bulbs available to the public."

47. T: <u>Two things happened in this sentence or these two clauses</u>. Two things happened. Talk to a partner and tell them what happened.

48. (Students discuss in small groups.)

49. T: Okay… 3/2/1… Who would like to start? We're talking about two scientists. What can you tell me about them? <u>You're going to find the detail or meaningful chunk on the board</u> (referring to the paragraph projected on the board). Shaker?

50. S7: Thomas Edison made large numbers?

51. T: Of what?

52. S7: Of light bulbs.

53. T: Okay…So, <u>what is a key word that you are missing</u>? <u>There is a process</u>…

54. S8: He figured out.

55. T: Excellent. Go get a ticket. (In reference to a reward system Ms. Youssef uses to acknowledge particularly helpful contributions)

56. T: So, what do I write under Thomas Edison? Class?

57. Ss: Figured out how to make large numbers of light bulbs. (Ms. Youssef writes this on the tree map.)

58. T: What other information I can summarize or retell in my own way from this sentence?

59. S9: [Inaudible].

60. T: No. I am talking about this information [pointing].

61. S10: Henry Woodward sold his idea to Thomas Edison.

62. T: YES. So what <u>did he do</u>? Sold idea to Thomas E.

63. S6: IF he had money, he would not.

64. T: So now I'm hearing, IF he had, he would have…what are you doing here?

65. Ss: Comparing and contrasting/cause and effect.

66. T: Cause and effect.

Who invented the light bulb?

Thomas Edison	Henry Woodward
Figured out how to make large numbers of light bulbs	Invented the light bulb Not enough money Sold idea to Thomas E.
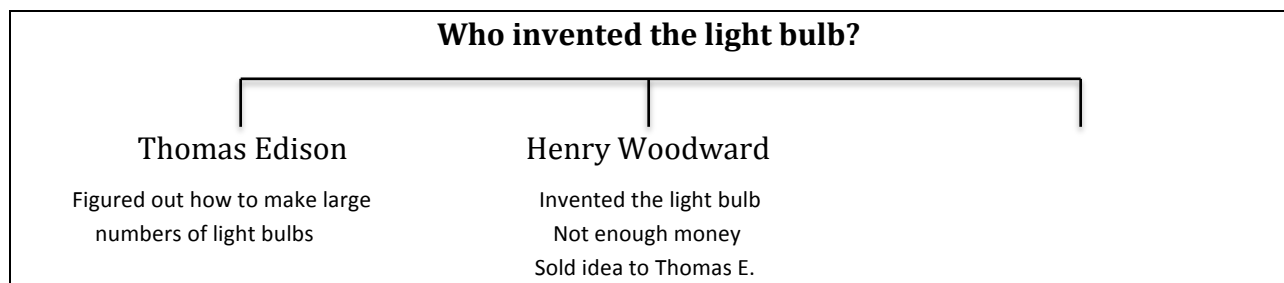
The tree map as it looked at the end of the episode above, U3, L5 (7:53-18:16).

The functional grammar metalanguage of participants and processes aligned well with the heuristic of the tree map. Ms. Youssef explicitly stated at the beginning of the lesson, "If you are thinking about the participants and the process that they did, you should be able to help me summarize the important information about this gentleman and this gentleman" (line 7).

Supported by questions such as "Who invented the light bulb? (line 21) and "Which scientist did not have enough money?" (line 36), Ms. Youssef helped her students focus on one of the main participants in the paragraph, Henry Woodward. Then by asking "What did Thomas Edison do?" (line 32), pointing out to the students, "Two things happened in this sentence or these two clauses" (line 47), and eliciting, "What is a key word that you are missing? There is a process…" (line 53), Ms. Youssef directed students' attention to the process associated with Thomas Edison, which was quite lengthy: figured out how to make large numbers of light bulbs (line 57). In the written curriculum, the objective of this lesson was to

summarize sections of the text. Ms. Youssef modified this lesson by adding the graphic organizer of a tree map to help her students summarize the information in the last two paragraphs of the text. The written curriculum suggested using the metalanguage of process and participant when reading the heading: *What process will we be reading about (inventing)? What participant will we be reading about (the light bulb)?* Ms. Youssef's enactment expanded the lesson plan, integrated a visual graphic to help students organize their summative thinking, and reinforced the purpose of identifying participants and processes throughout the passage.

Functional grammar metalanguage supported explicit attention to language.

Explicit attention to language in the text is of particular importance for English learners (Schleppegrell, 2013). In addition to providing explicit attention to word meaning in several ways such as replacing an unknown word with a known word, connecting text to prior experiences, and translating into Arabic, Ms. Youssef used functional grammar analysis accompanied by the metalanguage to bring students' attention to the language in the text. When Ms. Youssef explicitly introduced new metalanguage, she defined it, named it, and connected it to students' prior knowledge. The next step was identifying it in the text, followed by teaching and understanding the meanings it communicates.

For example, in Unit 3 Lesson 6, Ms. Youssef introduced the functional grammar feature of *connectors* for the first time. At the beginning of the lesson, she and her students read the lesson objective aloud together: "Students will develop an understanding of how authors use connectors to explain or signal unexpected information. Also, students will discuss in groups why authors use connectors." Using the functional grammar metalanguage poster the research team had made for teachers' classrooms, Ms. Youssef briefly reviewed the other metalanguage previously introduced (*participants*, *processes*, *circumstances* of time and place), and then she

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explicitly defined *connectors* and explained why authors use them. This review of previously

learned metalanguage and explicit teaching of a definition (lines 1 and 2 below) were not a part

of the original written curriculum.

Connectors: Their meaning and function
(Source: Unit 3, Lesson 6, 0:00-6:24)

1. T: Authors use connectors to link ideas, to explain ideas. They might write a long sentence and they might divide it into two parts and use one of those connector words to help us better understand what is the author trying to tell us, what is going on. The famous connectors that we might see—and, then, so, but—but these are not the only ones. We will be talking about a lot of them as we come across them in our reading selection.

    Following this introduction, Ms. Youssef proceeded to act out the action of "linking"

ideas by using two students on either side of her as she referred to herself as the connector "and."

2. T: And those connectors--they might come at the beginning of a paragraph, they might come in the middle of two clauses—two almost complete sentences—and may I have you come here (she points to a student and points to the area next to where she's standing). May I have you come here? (points to another student and asks her to stand on the other side of her. She stands in between the two students and she puts her hands on their backs.) And these are like two clauses. Sabreen is a beautiful girl (she takes a hold of Sabreen's hand) and Isa is a wonderful girl. Here I come, I am a connector (she links her arm through Sabreen's arm) Sabreen is a beautiful girl AND I am the connector (linking with Isa's arm) Isa is a wonderful girl. I am the connector. I connected my two ideas. What is the big idea I'm talking about? That these two are wonderful people. I am the connector. Let's practice and we will have a better understanding.

    After this introduction and demonstration, Ms. Youssef began to use some of the written

lesson plan. She began with distinguishing between simple and complex sentences. To teach how

connectors function in complex sentences as compared to simple sentences, we had suggested

teachers frame this discussion by first projecting the following sentence on the Promethean

board: "Protons, neutrons and electrons are very different from one another," and saying:

Sometimes sentences are simple, with one process. For step two, we suggested they project the

sentence: "Protons have a positive charge and electrons have a negative charge," and say: *But*

*sometimes sentences are complex, with more than one process. When sentences have more than one process, the two clauses are often linked with a **connector**.* However, rather than explicitly telling her students this information, Ms. Youssef projected the sentences on the Promethean board and then engaged students in a discussion about the process and participant before asking them to find the connector. The transcription below illustrates the conversation about the complex sentence example.

Connectors: Their meaning and function (continued)
(Source: Unit 3, Lesson 6, 11:24-13:14)

3. T & Ss: "Protons have a positive charge and electrons have a negative charge."

4. T: So, when I look at this sentence, where is the being? It's right there for you, where is the being? What are they telling me is a fact?

5. S1: Have.

6. T: Have. *Who* have?

7. Ss: Protons.

8. T: Protons HAVE a positive charge. What is the other information in the second clause?

9. S2: Electrons have—

10. T: [HAVE] a negative charge

11. S2:   [a negative charge]

12. T: And how is the author linking (moving hands toward one another) these two ideas? What connector is the author using? Look at the sentence. How is the author linking? (moving hands together again, translates the question into Arabic.) Talk at your table. (Students discuss.) OK, who would like to participate? Samir?

13. S3: He used the connector "and."

14. T: He used the connector "and" because he wants to link these two parts.

In the episode above, Ms. Youssef introduced *connectors* by explaining their function and why authors use them (line 1). She then demonstrated the action of "linking" with the help of two students (line 2). After reading the example of a complex sentence, she asked students to identify the *being process* (line 4), which was quickly identified (line 5). Then she asked about the participant associated with that process (line 6), which was also quickly identified (line 7). She then used the linguistic term "clause" and asked her students to identify the information in the second clause of the sentence (line 8). Having established the two separate meaningful clauses, she arrived at the focal point of her instruction, the function of connectors in a complex sentence, and once again used physical gestures to demonstrate the action of linking or connecting two ideas (line 12). Then she asked students to identify the actual connector "and."

This episode illustrates how Ms. Youssef brought explicit attention to language by introducing the new metalanguage, reminding students of previously learned metalanguage, using a concrete example of the word "and" to represent how connectors *link* two ideas, and providing text-based examples of the connector "and." Although focused on the structure of language, Ms. Youssef's instruction situates the learning of structure alongside function (i.e., why authors use connectors and the purpose they serve). This episode foreshadows students' further exploration of how, specifically in the electricity text, the author used connectors to signal surprising or unexpected information. A description of this follows in the subsequent section on author's craft.

Instances in which functional grammar supported a focus on the language in the text had two meaning-making functions: 1) understanding how the English language works to support students in their understanding of written language more broadly, especially for learners who speak a language other than English at home; and 2) setting the stage for the building of

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conceptual understanding to follow. Ms. Youssef's attention to language was a necessary step in the progression of analysis, just as it was in Units 1 and 2. Ms. Youssef also used functional grammar to bring explicit attention to language in episodes focused on building conceptual understanding and in episodes focused on the analysis of author's craft. In instances of studying author's craft, she used functional grammar to support her students' thinking about word choice and author's purpose. I turn to examples of such instances next.

Studying author's craft to support comprehension.

An attention to author's craft runs throughout the lessons in Unit 3. Whenever Ms. Youssef asked the students to consider why the author would use a particular word, such as the word "but," or when she asked them to look for evidence of the author's attitude, she was drawing attention to the author of the text and the choices she made in writing the text. These instances of using functional grammar to help students analyze author's craft stood apart from the other ways in which functional grammar was used because they emphasize the ways in which texts (written or spoken) are the result of linguistic choices (Halliday, 1978). A focus on author's craft is agentive because it raises awareness about the decision-making person on the other end of the words. Thinking about why an author chose to use certain words helps students consider the purpose and the meaning of the words. Although overt expressions of opinion are not common in science texts (Christie, 2012), author's perspectives and attitudes in informational genres are often implicitly encoded in the text's overall purpose and reflected in the author's word choice.

For example, at the very beginning of Unit 3 Lesson 1, Ms. Youssef asked her students to reread three paragraphs in the text with their table groups and find the author's attitude. The functional grammar metalanguage of attitude, and children's understanding of attitude, was

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central to the purpose for reading. Ms. Youssef's instruction reflected the lesson plan as it was written. However, in the lesson plan, there were no suggestions as to what the attitude words might be so this task required interpretation on the part of the teacher and the students. The first paragraph of the text read as follows:

> You flip a switch and a room that was in total darkness becomes bright as day. You press a button and a machine that was completely still whirrs into action. Every day we experience the wonder of electricity and give it very little thought. But the story of how electricity was invented is a very interesting story; one that is filled with clever thinking, good fortune, and even cheating!

Finding words that show author's attitude
(Source: Unit 3, Lesson 1, 31:37-37:04)

T: Sometimes authors as well have attitude in their words. We talked about the line of attitude. Who can tell me about the line of attitude? Who can explain to me what is the line of attitude? Mohammad. Stand up. Go to the line of attitude and talk to us about it.

S1: The line of attitude is like your attitude of negative, neutral or positive.

T: What does neutral mean?

S1: Like half negative, half positive.

T: OK. Right now you will be reading these three paragraphs, and at your table I would like you to discuss if you come across any attitude words and where would you put them. First, you are going to read. Next, you are going to discuss are there any attitude words in these three paragraphs? Read then discuss. (Students discuss.) 3/2/ and 1. Give me your attention for a second. We said attitudes; authors sometimes use certain words to reflect their thinking, their feelings, or how they view, their opinion about something. So in this selection the author used certain words to send a message to us, to show us an attitude. What do you think are some of the words that show attitude? I would like you to come and point them to us over here. Khalil.

S2: Clever thinking?

T: Clever thinking. So I go back (rereading the text and pointing to it on the Promethean board as she does so): "[…] one that is filled with clever thinking." Do you agree with him and why?

S3: Because clever thinking—

T: Do you agree with him that that's a word of attitude?

S3: Yes.

T: Why?

S4: Because when you think it's like a—

T: Let me ask you this. Is it a positive or a negative attitude?

Ss: Positive/Because it's clever.

T: Positive. It is a positive. When I tell you you are clever, that's a positive thing. Jafar, go place it on the line of attitude. (Jafar places it on the attitude line, the same attitude line from Units 1 and 2.)

As this episode progressed, students made other suggestions such as "darkness" and "very little thought." In response to these contributions, Ms. Youssef clarified the difference between an attitude word and a word that may conjure a particular feeling, such as darkness, and she pointed out how a word like "very" is used to amplify (i.e., turn-up) but not to show attitude. To try to further understand why the student (S5) perceived author's attitude in the phrase "very little thought," Ms. Youssef reread the sentence and unpacked its meaning further with the students.

Finding words that show author's attitude (continued)
(Source: Unit 3, Lesson 1, 38:57-40:22)

T: Where is the attitude here? I still don't see it. Help me. [. . .] To whom is the author talking?

Ss: Us/To everyone

T: Where? Where does it show she's talking to us? (rereading) "Every day WE—

Ss: WE

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T: We. OK. We do what?

Ss: Experience.

T & Ss: (reading) "Experience the wonder of electricity."

T: Right now we are experiencing the wonder of electricity. Promethean, the lights, computers, ELMO. OK? (reading) "and give it very little thought." So, what do you think the attitude is here? [. .] Is there an attitude? I don't think there is an attitude but I can see your point. I think what you are trying to tell me the author is blaming us for not thinking and appreciating deep. So it might be, it might be an attitude. Very little. Would that be positive or negative though?

S5: Negative.

S6: And turned upward.

These two episodes above provided an opportunity for students to think about the connection between the author's word choice, the implicit meaning or message in those words, and the audience. In Units 1 and 2, students were engaged in analyzing a character's attitude in narrative text. In contrast, Unit 3's informational text lent itself to the analysis of the author's attitude rather than a character's attitude. In both genres, authors make linguistic choices and rhetorical moves to show attitude, but in informational text, the attitude is attributed to the author unless the text is describing a person or thing that embodies attitude as a result of personification.

Later, in the last lesson of Unit 3, Ms. Youssef gave her students another opportunity to think about author's word choice and how it shapes meaning. She had just introduced the metalanguage and meaning of *connectors* 30 minutes prior (described above in the section on explicit attention to language) and was now asking her students to locate the important connectors in the following paragraph, which they had read multiple times throughout the unit for other purposes. After locating the connectors, she asked the students to discuss why the author would use connectors. In this episode, Ms. Youssef elicited student' ideas and consistently attempted to extend their thinking beyond their current understanding of connectors

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(words that link two ideas) to the particular meaning of the connectors in focus here (to signal unexpected information) by asking students why authors would choose to use such words.

Inventing the Light Bulb

An important way we use electricity today is to light our homes and communities. Many people think Thomas Edison invented the light bulb. But, in fact, a Canadian scientist named Henry Woodward was the first to develop the light bulb. Unfortunately, he did not have the money to make light bulbs after inventing them. He sold his idea to Thomas Edison, who was the first to figure out how to make large numbers of light bulbs available to the public. He made the light bulb practical and that is why we associate his name with light bulbs.

"But, in fact" connects and signals surprising information
(Source: Unit 3, Lesson 6, 33:20-39:45)

1. T: Read this paragraph and find any connectors. And I want you to find the important ones. I am not looking for "and" in this paragraph. So start reading. And once you signal those connectors, discuss at your tables. Just this paragraph. Inventing the Light Bulb. (Students discuss and Ms. Youssef circulates to listen to groups and remind them to read just this one paragraph and discuss why.) Alright, we have been talking about meanings and connectors. And we said connectors tell me what? What do they tell me, connectors in general?

2. S1: They tell you what's an important fact.

3. S2: To connect the sentences with each other.

4. T: To connect or?

5. S3: Or to read the sentence.

6. S4: To give more information.

7. T: To give more information or what did we say in our objective? Read.

8. T & Ss: Understand how authors use connectors to explain or signal unexpected information.

9. T: Unexpected information or surprised information. So where is the connector in this paragraph that is surprising you? That the author chose to surprise you with some information.

10. S5: But, in fact.

11. T: But, in fact. And Malak, look at this one. Read.

12. S6: "But, in fact, a Canadian scientist named Henry Woodward was the first to develop the light bulb."

13. T: Ah, so Malak, can we start our sentence with a connector. Did the author start the sentence with a connector?

14. S6: Yes.

15. T: So is it possible to do that?

16. Ss: Yes.

17. T: Yes, it is. Either in the middle or at the beginning. As long as it's in the proper place. Why is this the connector here? What is the author trying to tell me?

18. S7: It wants to give people more information like to get their attention.

19. T: OK, what else? Let's read.

20. T & Ss: Many people think Thomas Edison invented the light bulb.

21. T: So what do people think?

22. Ss: People think Thomas Edison invented the light bulb.

23. T: Then the author says, "But, in fact—"

24. T & Ss: "a Canadian scientist named Henry Woodward was the first to develop the light bulb."

25. T: What kind of attitude is the author trying to bring me here? Jafar.

26. S8: He's trying to tell that Henry Woodward was the first to develop the light bulb.

27. T: Did he surprise me—

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28. Ss: Yes.

29. T: —with that information?

30. Ss: Yes.

31. T: So the author did surprise me by correcting what? (pointing to the text)

32. Ss: What people think.

33. T: What people thought about Thomas Edison. So do you think he made a good choice?

34. S9: Yesss.

35. T: When we are writing, we have to think about our word choices (pointing to the word choice 6+1 trait poster on the wall). And what to connect and what to put.

Ms. Youssef began this episode by giving her students the task of reading the paragraph and looking for connectors other than "and" (line 1). Her instruction was guided by the lesson plan as she was wanting to students to notice a specific connector in this paragraph, "But, in fact." After students read the paragraph and discussed it in small groups, she elicited students' ideas about the function of connectors (lines 1-6). Recall that she had introduced the metalanguage and meaning of connectors 30 minutes prior to this episode so asking students about the function of connectors served as a quick review of what they had just learned. She then drew their attention back to the lesson objective to extend students' thinking (lines 7 and 8). After reminding students that connectors can signal unexpected information, she brought the author's intention into the conversation and asked students to find the connector that surprised them, stating that the author surprised the reader with some information (line 9). A student provided the connector in the paragraph that fulfilled this function, "But, in fact" (line 10).

Then Ms. Youssef took this opportunity to address Malak's earlier question (not in this episode) about whether or not connectors can be used at the beginning of a sentence (lines 11-

16). This example illustrates that connectors can be used as such. (Teachers often instruct students not to use "but" at the beginning of a sentence. During the Language and Meaning project, this was a point of discussion among participating teachers. Perhaps as a result of recognizing SFL's orientation to grammar as a network of choices rather than a set of rules, Ms. Youssef chose to affirm the use of connectors at the beginning of a sentence.) Through her dialogue with Malak, Ms. Youssef maintains the focus on the author's craft (lines 13-16).

Then she asked a question of the whole class about what the author is trying to tell the reader (line 17). This question aimed to extend students' thinking and support them in constructing the meaning of the sentence; at this point in the discourse, the focus shifted from the function of the connector to the author's message, the content of the passage. She refocused students' attention to the text by rereading the sentence preceding the connector (lines 19 and 20), checking for students' understanding of that sentence (lines 21 and 22), and rereading the connector and the sentence that followed it (lines 23 and 24). Then she asked what kind of attitude the author was trying to give the reader, referring again to the author's intent rather than the content of the message (line 25). But Jafar remained focused on the content in response, repeating the text almost verbatim (line 26). Ms. Youssef maintained her focus on the author's intention to surprise in her response to Jafar (line 27 -29). And then she blended the focus on the author's intention to surprise with the surprising information itself (lines 31 and 32). She concluded the episode by eliciting students' evaluation of the author's word choice (lines 33 and 34) and reemphasizing the importance of thinking about word choice when writing, in particular the ideas we are trying to connect and which connector to use to do so (line 35).

In analyzing this episode line by line, the complexity of Ms. Youssef's instruction becomes even more evident. In this one episode, she positioned the students to identify a

connector other than "and," understand its function "to surprise," and comprehend the actual information in the text that was surprising. She did so through focusing on the author as the creator of these special text effects and eliciting an evaluation of the author's choice. By focusing students' attention to the meanings of the two clauses being connected and the relationship between them, she supported students' construction of logical relations (Van den Broek & Kremer, 2000). This episode exemplifies how reading for meaning and the analysis of author's craft can fuel one another. The complexity and artfulness of Ms. Youssef's teaching is also revealed when looking at the difference between the written curriculum and Ms. Youssef's instruction during this episode. In the written curriculum, the instructions for this portion of the lesson read as follows:

> *Now, you will look closely at an excerpt from the text and try to figure out where the connectors are.* (This excerpt should be projected. The answer is: "but, in fact". This means that we are not expecting that someone other than T. Edison invented the light bulb.)

Although this step in the lesson plan could be interpreted as a summative yet isolated activity in the lesson on connectors, Ms. Youssef's instruction in the episode reflects an intention to support students in approaching the text through the eyes of the author, with knowledge of connectors, to synthesize all prior learning from this lesson. In her enactment of this portion of the lesson, Ms. Youssef built upon previous discussions about the connectors *and* and *but*, students' current understanding of connectors, and the text to contextualize the use of functional grammar metalanguage within an analysis of author's craft.

Summary of meaning-making opportunities with functional grammar.

The findings above suggest three primary ways in which functional grammar served as a tool for meaning-making in Unit 3: Ms. Youssef used functional grammar analysis to support

students' construction of conceptual knowledge, bring explicit attention to language in the text, and support students' understanding of author's craft. The functional grammar metalanguage provided a lens with which to focus students' attention on the language in the text. This focus on language was coupled with Ms. Youssef's consistent reiteration of previously read material, which reinforced students' conceptual understanding, in particular understanding of scientific processes (i.e., logical relations).

When teaching summarization, Ms. Youssef's emphasis on *participants* and *processes* helped students co-construct a summary of "who (participants) did what (processes)" in the history of the invention of electricity. When working with a new linguistic/meaning-making tool such as *connectors*, she defined it, named it, and connected it to students' prior knowledge before asking them to apply the knowledge of this metalanguage while reading. And when she supported students in the analysis of author's craft, she emphasized the ways in which texts (written or spoken) are the result of linguistic choices (Halliday, 1978). A focus on author's craft reinforced the purpose for which the author used particular words to convey information. As the episodes above illustrate, Ms. Youssef used the written curriculum as a guide, but her enactment elaborated upon the lesson plans provided. Her employment of functional grammar as a tool for meaning-making was situated within a rich instructional context comprised of an array of instructional practices.

Challenges with Language in Science Text

In Unit 3, the functional grammar analysis in the written curriculum and Ms. Youssef's enacted curriculum reinforced the emphasis on retrieving text-based information, using the text as a source for learning about science. However, the language in science texts is laden with technical vocabulary, abstract concepts, and linguistically complex clauses. These features make

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science texts challenging to teach, especially when English itself is new for learners. To navigate this challenge, Ms. Youssef encouraged students to use their prior knowledge of unknown words, which may not have always supported accurate scientific understanding. She also tried using functional grammar metalanguage to bridge the hands-on experiences to the ideas in the text, but sometimes this connection was not clear.

The risk in eliciting prior knowledge when teaching science with text.

In trying to make abstract scientific concepts accessible to students, teachers and authors of children's science texts often anthropomorphize concepts. This can be problematic because giving human characteristics to nonhuman phenomena inaccurately portrays scientific principles; this can lead to misconceptions (Cervetti et al., 2009). At several points throughout the unit, Ms. Youssef encountered the challenge of making the concepts more accessible and did so in ways that may not have reinforced the accuracy of the concepts. For example, Ms. Youssef referred to the attitude line (used in Units 1 and 2 to analyze the *polarity* and *force* of character's attitudes) to reinforce the idea of positive, neutral and negative charges. This may have implied that charges have feelings, which is not scientifically accurate. However, Ms. Youssef's use of the attitude line could also have been a language teaching strategy, referring to the attitude line to help students recall where they had used the words positive, negative and neutral previously.

When teaching the word conductor, she referred to the conductor of an orchestra, which the students had seen on a field trip to the symphony, and the conductor of a train, which the students had read about in another text. She explained that the conductor in the electricity text was similar because it has a job. Ms. Youssef was trying to help her students connect their prior knowledge of the word conductor to their new learning, which is necessary for learning and in particular, reading comprehension (Bruer, 1993; Pearson & Anderson, 1984). However, in this

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case, the person who directs an orchestra or drives a train is different from a material (e.g., metal) through which an electric current passes. The word "conductor" has multiple meanings. When teaching new vocabulary, teachers should provide examples of how the word is used in other contexts (Beck et al., 2013), but the word's meaning in the particular context needs to be in focus so that the examples reinforce the meaning as it pertains to the concept in the text, especially for English learners. When learning a new language, knowing a word has multiple meanings is helpful, but during an interactive read aloud, with the focus on building conceptual understanding, the examples a teacher provides should reinforce the meaning of the word in the text.

Helping students make connections between their prior knowledge and the text can often be challenging, especially when learning a language, because it requires the ability to conceptualize abstract ideas. When very young children begin to use language, they are able to talk about what is immediately present and concrete (Menyuk & Brisk, 2005). The ability to talk about something that occurred in another time or place develops later because it requires a level of abstraction that is the result of more sophisticated cognition and language use. In classrooms, hands-on experiences for students are very concrete. Text, on the other hand, is abstract (Christie, 2012; Fang & Schleppegrell, 2008). Particularly with English learners, teachers need to be very deliberate about the ways in which they use discussion to build a bridge between students' hands-on experiences and their ability to use academic language to articulate their conceptual understanding (Gibbons, 1998, 2004, 2015).

Disconnect between hands-on experience and language in the text.

In her enactment of Unit 3, there were episodes in which Ms. Youssef successfully used functional grammar metalanguage to clarify the sentence meaning and then further supported

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students' understanding of a concept by referring to the hands-on experience of building a simple circuit or other visual representations, but there were also instances in which this was challenging. In Lesson 4, prior to reading the sentence in the text, "The electric current provides energy that makes things run," the students had built a simple circuit. When discussing this sentence, she asked the students to identify the participant, who is doing the work, who is involved. A student suggested electricity. Ms. Youssef was looking for the exact words from the sentence, *the electric current*. She redirected to student back to the text. Eventually the student identified the participant and other students identified the process—*makes things run*—but this exchange about the text was not connected to what they had witnessed (the bulb illuminating when the wires connected) when they built a simple circuit just prior to reading this text excerpt.

In a subsequent episode immediately following the one described above, Ms. Youssef chose to focus on the science concepts rather than the language in the text. Functional grammar analysis was not always the most efficient way to help students connect the text to their hands-on experience. The questions, "What is an electric current? Why are wires conductors?" targeted the science concepts more directly than asking, "What is the *participant* and the *process* in this sentence?" But the first set of questions only addressed the science and not the language in the text. Ms. Youssef recognized the limitation of trying to use functional grammar as a way to build conceptual understanding. "The concept of electricity is very abstract. This unit needs more visuals other than drawing an atom or a simple circuit. I would immerse students with colorful images and videos to comprehend how electricity works. But I understand that the goal was to see how FG can help students unfold difficult concepts" (Youssef, Unit 3, reflection log). The concept of electricity is abstract and text itself is abstract. Her recommendations make sense.

In her reflection log, Ms. Youssef also commented on the challenge of text itself and the varied reading abilities of her students. "Many of my students thought that an atom is the smallest part of silver. I had to clarify that silver is an example of matter" (Youssef, Unit 3, reflection log). She also stated, "I had to clarify that current is not just electric. It can be water current too." In addition to some misconceptions she felt she needed to clarify, Ms. Youssef mentioned the need for more practice with the functional grammar aspects of the curriculum: understanding *participants* are the "doers" and "receivers" of actions, applying functional grammar analysis with informational texts, identifying and understanding the function of *connectors*. Despite the need for more practice, she rated the factors of "usefulness of the functional grammar analysis" and "student engagement" in the unit overall very highly. As she wrote in her Unit 3 reflection log, "[…] identifying the participants helped the students rethink and focus on who is doing what. Even though I had to stop sometimes and ask the same question in different way, towards the end of the unit, the children have [sic] become better in pulling out the participants in other subjects" (Youssef, Unit 3, reflection log). She said if she were to teach these lessons again, she would do more to build students' knowledge of energy and matter prior to reading the text and provide more visuals and more interactive experiences to support students' conceptual understanding during the unit.

Summary of challenges with language in science texts.

Much of the language in science texts is challenging because its function is to present technical and often abstract concepts (Lemke, 1990; Schleppegrell, 2004). For English learners, and teachers of English learners, this requires the use of meaning-making strategies that serve to make abstract concepts concrete and accessible. In attempting to make scientific vocabulary and concepts accessible, teachers and authors of children's science texts often anthropomorphize

concepts, which can lead to misconceptions (Cervetti et al., 2009). Hands-on experiences can help to make abstract concepts more concrete, but connecting these experiences with the information in the text can be difficult. A linguistic instructional tool such as functional grammar analysis can keep the focus on the language in the text, but this is not always sufficient. Ms. Youssef's reflection log comments point to the complexity of using functional grammar analysis in tandem with building conceptual understanding in informational science texts. With its own metalanguage, functional grammar analysis is a new way of thinking and approaching the reading of texts; if students are to become comfortable and adept at using it as a tool to support their own reading comprehension, they will need a lot of practice with it. Additionally, if learning the science content is the goal, educators (and curriculum designers) need to use other forms of media (e.g., visuals, video), in addition to text, to bolster students' understanding. Perhaps this is especially true when teaching English learners.

Conclusion

In Unit 3, Ms. Youssef and her students read an informational science text, *Electricity: What Is It and Who Invented It?* (Palincsar, 2012). This text explained the concept of electricity and provided some historical background on the scientists who invented it, made it accessible to the general public, and profited from the entrepreneurship. The unit was designed to support students' comprehension of the ideas and concepts presented in an informational science text. The lessons provided teachers with materials, suggested procedures, and instructional dialogue to be used in whole class, text-based discussions with students. Functional grammar analysis was embedded into the lessons as an approach to help students understand how the language in the text communicated the science concepts and the author's purpose. The fourth-grade lessons were designed to aid teachers and students in their use of previously learned metalanguage

(*participant* and *process*) and new metalanguage (*author's attitude* and *connectors)* in the service of meaning-making with informational text. In this study of Ms. Youssef's enactment of Unit 3, I addressed the question: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific teaching practices, tell us about the opportunities and challenges of a functional grammar approach to supporting student' meaning-making with informational science text?

Instructional Practices

To identify the instructional practices Ms. Youssef employed in Unit 3 and illustrate their nested, contextualized and interconnected nature, I analyzed one lesson in its entirety. I examined Lesson 3 in which the students were reading about "the battery." The lesson was divided into five distinct sections: preparation for learning, small-group discussions, interactive read-aloud, creating a visual, and the summary. It was evident that she used the lesson plan to inform her teaching and then departed from it in significant and profound ways to make the material accessible for her students. Throughout this lesson, Ms. Youssef's decision making was reflected in the participation structures she used to frame discussions (e.g., whole-group and small-group), the instructional techniques she used to teach both conceptual and linguistic principles (e.g., iterative readings of the text, shared reading, explicit vocabulary instruction, demonstrations and modeling, functional grammar analysis) and the discourse moves (e.g., questions aimed at logical relations, translating into Arabic) she made to elicit and build upon student thinking. These practices were evident throughout Ms. Youssef's enactment of Unit 3. In this lesson that was analyzed, these practices enabled her to facilitate an in-depth discussion and analysis of two paragraphs in the text and support students' conceptual understanding of a battery.

Opportunities for Meaning-Making with Functional Grammar

Opportunities for meaning-making were identified as three primary ways in which functional grammar was used as a tool for meaning-making in text-based discussions. *Ms. Youssef used functional grammar analysis to support students' construction of conceptual knowledge*. Through discourse analysis, it became evident that the scientific concepts in this unit were represented linguistically in the text as phenomena in relationship to one another. The focus on *participants* and *processes* provided a way for Ms. Youssef and her students to analyze and determine which "things" were "doing" what in an atom, a battery and a simple circuit. This was also the case in their discussions about the scientists themselves; the metalanguage of participants and processes helped students summarize the history of the invention of electricity and the people who were involved.

Ms. Youssef also used functional grammar analysis to bring explicit attention to the language in the text. This was particularly evident when new metalanguage, such as connectors, was introduced for the first time. Through explicit instruction, she would tell students the meaning of the text feature through describing its purpose. This explicit instruction was provided before engaging students in identifying the text feature in the electricity text and determining why authors would use particular words.

In addition, Ms. Youssef used functional grammar analysis to support students' understanding of author's craft. In the previous units, students had worked with the heuristic of the attitude line in their discussions about character's attitude. In the written curriculum for this unit, the research team shifted the focus to the author's attitude as it is revealed in informational texts, which can be subtle and difficult to detect. Ms. Youssef used the functional grammar

metalanguage of attitude to help students understand that authors can both present an attitude and attempt to engender an attitude, or have an effect, on the reader.

Challenges with Language in Science Text

The technical vocabulary and lexical density found in informational science texts make them challenging to read and challenging to teach, especially if learners are new to the concepts and new to the language. In her enactment of Unit 3, Ms. Youssef consistently directed students' attention to the text as a resource for constructing understanding. To make sense of new vocabulary, she encouraged students to draw upon their prior knowledge and provided examples of the word in other contexts, but sometimes this led to the anthropomorphosis of scientific concepts, which can lead to misconceptions. In response to the written curriculum, she used functional grammar metalanguage to facilitate discussions about the phenomena and relationships among the phenomena, and in many episodes, this pairing of the attention to the language in the text with the ideas in the text supported students' conceptual understanding. However, using the functional grammar metalanguage to talk about the language in the text was not always the most direct method with which to connect students' learning acquired through hands-on experience with the ideas presented in the text. To connect the hands-on learning experience with the text, questions that elicited students' understanding of the logical relations were more efficient.

Implications

Opportunities for meaning-making with informational science texts need to be situated within an instructional context that supports English learners' co-construction of knowledge. With each lesson bookended by clear, explicit objectives and a summary of what was learned, meaning-making opportunities are facilitated by instructional practices that encourage students'

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engagement with the text. Most notably, for English learners, this includes iterative, interactive read-alouds of small sections of the text. With each reading, the teacher can scaffold students emerging understanding of the phenomena, processes and concepts. This requires explicit instruction of unknown vocabulary, explicit attention to linguistic features, and constant attention to the development of referential and logical relations throughout the text. A coherent mental representation of the text can be further reinforced through hands-on experiences, demonstrations and models using realia, and the construction of visual/graphic representations of concepts presented in the text.

The goal of meaning-making with informational science text is to build conceptual understanding. To understand scientific processes as explained in texts, readers must establish logical relations (Van den Broek & Kremer, 2000). With functional grammar analysis, teachers can help students understand how the meanings in informational text are encoded linguistically. This attention to language situated in meaningful conversations about texts gives students opportunities to recognize forms and patterns in the ways authors use language to present scientific processes in informational texts. Specifically, the metalanguage of *participant* and *process* can focus students' attention on relationships among phenomena. The metalanguage of *connectors* (e.g., and, but) makes it possible to talk about the ways authors connect ideas or introduce contrasting information, *and* teachers can use this awareness of connectors to help students attend to the relationship *between* the ideas, again supporting readers' construction of logical relations. Furthermore, when teachers highlight authors' word choices, discuss why authors choose particular words, and highlight the attitudes implied in certain words, students can become more critical of informational texts; rather than assuming an informational text is

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purely factual, using the metalanguage of *author's attitude* helps students recognize the sometimes subtle difference between fact and opinion in informational texts.

Informational science texts can be challenging for all students, but because of the linguistic demands, these texts can be even more challenging for English learners. Through adopting a linguistic orientation to meaning-making, teachers become more aware of the challenges inherent in informational science texts and ways in which they can help English learners learn how to navigate these challenges.

CHAPTER 7: UNIT 4 – CONSTRUCTING AN ARGUMENT IN SCIENCE

Introduction

In the previous findings chapter, I investigated the instructional practices, opportunities, and challenges that were revealed in Ms. Youssef's enactment of the curricular unit designed to support students' conceptual understanding using an informational science text. In this chapter, I will explore the instructional practices, opportunities, and challenges that were revealed in Ms. Youssef's enactment of Unit 4, which was designed to support students' comprehension of the ideas presented in *two* informational science texts—*The Cane Toad Invasion* (O'Hallaron & Moore, 2012) and *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012)—and the construction of an argument using evidence from these texts. In this study of Ms. Youssef's enactment of Unit 4, I sought to address the same question I addressed in the previous chapter: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific instructional practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with informational science text?

In this chapter, I begin with a discussion of the argument genre in the domain of science. Next, I briefly describe the data sources and data collection for this unit of study, followed by a description of the written curriculum for Unit 4. Then I present the findings. I describe the instructional practices Ms. Youssef used in her enactment of the curriculum. Subsequently, I illustrate and discuss the opportunities for meaning-making that arose as a result of Ms. Youssef's enactment of Unit 4. Additionally, I discuss the challenges that were revealed, which

were most evident in Lessons 4 and 5. I conclude with a summary of the findings and instructional implications.

The Argument Genre: Debating a Life-Science Issue

For students to construct an argument and skillfully use evidence from informational texts to support their claims, they need to develop an understanding of both the issue under discussion and the structure of an argument. In her study of how language demands evolve across the school years and vary across content areas, Christie (2012) explains:

> [I]n a genre-based pedagogy in the SFL tradition, there are equally important goals having to do with teaching the field of knowledge for writing and the target genre for writing. Hence, a great deal of attention is devoted—normally over several lessons—to building the language and the field of knowledge. It is only after some substantial work has gone into this phase, preparing the learners to understand the knowledge they need, that a later phase of discussing and modeling the target genre is introduced. (p. 59)

To develop students' understanding of an issue, or "field of knowledge," teachers can use informational texts that provide information on the concepts and topics that reside at the center of the issue. Through reading about and discussing the pertinent concepts, students become familiar with the conceptual terrain as well as the ways in which authors use language to explain or describe the concepts; this is what Christie (2012) refers to as "the language and the field of knowledge" (p. 59). As was illustrated in the previous chapter, teachers can also provide hands-on experiences and multimodal learning experiences through which students develop domain knowledge. Once students have had opportunities to build domain knowledge and an understanding of an issue of concern, they can be supported in using that knowledge to construct

an argument, to take a position on an issue, or as it is commonly referred to in schools, "take a stand" in their writing.

The effectiveness of a written argument depends upon the clarity of ideas, the logic, and the soundness of the reasoning. To reiterate, as stated in the Common Core State Standards for writing in fourth grade, students are expected to "write opinion pieces on topics or texts, supporting a point of view with reasons and information" (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). Fourth-grade students should be able to "introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose." They need to, "provide reasons that are supported by facts and details; link opinion and reasons using words and phrases; and provide a concluding statement of the section related to the opinion presented," (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). These standards emphasize the importance of teaching the features and stages of an argument.

One of the ways students learn how to write an argument is to first construct it orally, through discussion (Wilkinson & Son, 2011). When students have the opportunity to orally articulate their argument (i.e., claims, evidence, reasoning, counterarguments, and rebuttals), they are better prepared to then transfer this thinking to writing (Anderson et al., 2001). Another instructional strategy that supports students' construction of a target genre is the deconstruction of model texts (Gebhard et al., 2014; Harman, 2013). These steps taken together—building of domain knowledge, using discussion, and the deconstruction of a model text to scaffold writing—are characterized by scholars in the Sydney School tradition of SFL as a *genre-based*

approach to teaching "disciplinary bodies of knowledge and the social semiotic practices that construct them" (Gebhard et al., 2014, p. 108).

In sum, in order for students to argue well, they need a solid understanding of an issue, and, ideally, a good understanding of several possible perspectives on the issue. They also need to understand the features and the structure of an argument. Each of these instructional goals— building domain knowledge, building knowledge of the issue, building knowledge of the genre— is highly complex. It requires an intertextual approach to teaching that fosters both text comprehension and text production with the use of multiple texts, an approach that is "rare in elementary classrooms" (Wilkinson & Son, 2011, p. 374). Most likely, this kind of teaching is rare because it requires a teacher to provide the time and the opportunities for students to read across texts and synthesize their learning from those texts into a coherent argument, which is yet another text. The teachers' instructional dialogue and the students' oral discussion and arguments are also considered 'texts;' the instructional episodes analyzed throughout this dissertation are examples of how such texts are produced during meaning-making endeavors.

Data Collection: Unit 4

For this unit, the Language and Meaning team wrote informational science texts to engage students in thinking about, and developing arguments around, genuine life-science issues. In grade four, the students studied the issue of introducing an invasive species into an environment, focused on the example of the introduction of the cane toad to control pests that were harming crops in Australia. This issue presented a compelling, real-world scientific dilemma and served as grist for writing an argument. Initial versions of the texts and the accompanying curricular materials had been designed in the previous year of the research project. In spring of 2012, Moore and O'Halloran developed the cane toad unit and piloted it in a

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fourth-grade classroom. The following year, the texts and materials were revised for implementation in April of 2013. The Language and Meaning research team and the participating teachers and literacy coaches gathered together for the fourth professional development institute of the year on April 12th.

Ms. Youssef enacted the Unit 4 curriculum in her classroom from April 23rd to May 15th, 2013. I drew upon several data sources specific to Ms. Youssef's enactment of Unit 4: classroom video and audio of seven lessons, observation field notes, Ms. Youssef's reflection log submitted after she taught the unit, and the July 2014 interview with Ms. Youssef.

The Written Curriculum: Unit 4

The issue.

In the Language and Meaning fourth-grade curriculum, Unit 4 was designed to promote students' critical thinking about human impact on the environment and the delicate balance of an ecosystem. The imbalance in an ecosystem, left unchecked, will eventually affect the existence of all living things. The health of an ecosystem relies upon a delicate balance among its living and nonliving constituents. To help young students understand abstract concepts such as *interdependence* and *invasive species*, the Language and Meaning Unit 4 curriculum provided concrete examples of how people in society are attempting to mitigate such problems. For example, farmers need ways to control pests and ensure the productivity of crops to sustain agricultural resources. One chemical-free solution is to capitalize on predator-prey relationships between animals and insects, such as the common household practice of populating a garden with ladybugs to control the presence of aphids. However, if pest control requires the introduction of a *non-native* species into an ecosystem, the repercussions can wreak havoc on the environment.

The texts.

In Unit 4, to support students' critical thinking about human impact on the environment and the delicate balance of the ecosystem, students read two informational science texts and constructed an argument using evidence from these texts. The first 4th grade text in Unit 4, *The Cane Toad Invasion* (O'Hallaron & Moore, 2012), described a real life-science issue in Australia involving the spread of a nonnative species: the cane toad. As the text explains, cane toads were initially introduced into Australia to eradicate a beetle that was eating the sugar cane crop. However, the cane toads became a large problem. They were reproducing at rapid rates, and they were eating many animals other than the beetles. Although the Australian government has tried to address this problem, they have yet to derive an effective solution that won't cause further damage to native species.

The second 4th grade text, *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012), described how scientists have been debating the use of a meat-eating ant, native to Australia, to kill the cane toads. Meat ants do not typically eat animals. They mostly subsist on the honeydew secreted from certain caterpillars, and in return, they protect the caterpillars from predators. However, meat ants are capable of eating meat. Farmers have used them to clean the carcasses of dead animals. Furthermore, there is evidence that the meat ants are immune to the cane toads' poison. Yet, using meat ants to kill the cane toads requires transporting the meat ants away from their nests, which could disrupt the delicate balance of the ecosystem. Using the meat ants to eat cane toads might radically change the ants' eating habits, and it might affect the survival of the caterpillars. As was learned with the introduction of the cane toads, implementing what appears to be a solution can negatively impact the environment; hence, the dilemma that was presented to

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the students: Should scientists use the meat ants to kill the cane toads or should they study the use of the meat ants further?

Each of the texts in Unit 4 was written to provide domain knowledge related to these life-science issues and serve as factual sources and support for text-based evidence and students' reasoning. The accompanying Unit 4 curriculum was designed to support students' reading comprehension (i.e., understanding of the science concepts presented in the texts), language development, and writing of an argument.

The curriculum.

The Unit 4 curriculum was similar to the curriculum in Units 1, 2 and 3; the lessons provided teachers with materials (e.g., a model of an argument, graphic organizers for writing stages of the argument, a visual representation of the likelihood scale), and suggested procedures, as well as instructional dialogue to be used in whole-class, text-based discussions with students. Similar to Unit 2, the Language and Meaning team drew upon the SFL theory of genre to provide a metalanguage that could be used to name and identify the purpose of the stages and linguistic features of a written argument (Martin, 2009; O'Hallaron, 2014). In addition, the metalanguage of *likelihood* and *usuality* was introduced in Unit 4 to help students: 1) interpret the degree to which an event was likely to occur, based on how an author used likelihood and usuality language in text, and 2) use likelihood and usuality words in their own arguments. In SFL, the likelihood and usuality metalanguage falls under the category of interpersonal or attitudinal meanings, often found in narrative texts but not solely. "Overt expression of opinion is discouraged in science, though judgment about scientific probability or likelihood may appear" (Christie, 2012, p.139). In Unit 2, students were introduced to the argument stages in the context of character analysis. In Unit 4, the metalanguage presented in Figure 7.1 including the stages of

an argument, was introduced in the context of constructing an argument based on scientific

evidence presented in informational text.

Metalanguage	Lesson introduced	Purpose
Argument stages	3	To present the parts of an argument and how the parts are organized.
Likelihood	4	To help students recognize how authors use language to show how *usual* or *likely* it is that something will happen
Counterargument	6	To anticipate what facts someone might use to disagree with their claim and determine how much they agree or disagree with those facts and why.
Description of the Issue	7	To write this stage

Figure 7.1. Functional grammar metalanguage in Unit 4, Grade 4 (Schleppegrell, 2014).

The written curriculum for Unit 4 consisted of seven lessons. In the first three lessons in

this unit, Ms. Youssef and her students read three different texts: *The Cane Toad Invasion*

(O'Hallaron & Moore, 2012), *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012), and the

model of an argument "No to the Ants!" Unit 4 was designed to support: 1) building domain

knowledge through reading two texts about an environmental, life-science issue, 2) shared

reading and discussion of a model argument specific to the life-science topic, and 3) writing of

an argument using the information in the texts. These goals made the reading of at least two

"domain" texts, and reading a model text for writing, necessary. The shared texts gave the

students common ground with which they could discuss different perspectives and assume

differing positions on the issue being debated.

In Lesson 4, the curriculum introduced language for talking about how usual and/or how

likely it is something will happen (i.e., the scale of usuality and likelihood) (see Figure 7.2.). The

lesson was designed to help students differentiate between words that indicate how often

something has occurred in the past (i.e., usuality) and words that indicate how likely it is that

something will occur in the future (i.e., likelihood).

How usual? Past	How likely? Future
High	
always, is, does	will
almost always	will almost definitelv
frequently, often	is very likely
	is likely, will probably
most times	should
sometimes	might, can, could, may, maybe, possibly
occasionally	
rarely	
almost never	will unlikely
never, is not, does not	will not
Low	

Figure 7.2. The usuality/likelihood scale in Unit 4.

The following three lessons (Lessons 5 through 7) were designed to support the students in writing an argument based on the information in the two pieces of text they had read in Lessons 1 and 2 and in response to the prompt: *Scientists in Australia think using meat ants might be one effective way to stop cane toads from spreading and hurting more organisms. Should Australia use the meat ants now or should they do more research on meat ants? Why? Support your answer with details from the text.* As with Unit 2, the teachers were provided a framework for the argument, which was informed by SFLs' definition of genre as "staged, goal oriented social processes" (Martin & Rose, 2008, p. 6) and Toulmin's (2003) components of an argument (claim, evidence, and warrants). In Unit 4, there were four stages: 1) *description of the issue* and the *claim*, 2) *evidence* and *reason*, 3) *counterargument* and *response to the counterargument*, and 4) *restatement of the claim*. Students had the option of including an additional evidence and reason stage. In designing the Unit 4 curriculum, the research team was cognizant of keeping the overall purpose for reading and writing foregrounded while providing a

systematic way of breaking down the individual stages of argument. As was stated in the overview of the written unit plan (p. 2):

> In Unit #3, the students learned how to use functional grammar to read informational texts carefully. In Unit #4, we continue to practice interpreting and learning from informational texts, but we also learn how to use content knowledge and word choices to write an argument in which we make a claim, provide evidence for the claim, and anticipate what someone else might say about our claim and evidence.

Lesson 5 focused on how to select evidence to support a claim and how to connect the evidence to the claim with a reason. Lesson 6 introduced the counterargument stage of an argument and outlined steps for supporting students in a debate regarding the two claims. Lesson 7 introduced the "description of the issue" stage and provided guidelines for how to help students construct a summary of the issue as the introduction to their argument. The last part of this lesson consisted of directions for helping students transfer their writing from the graphic organizers into one final draft. (For the complete texts and unit outline, see Appendix A. To view the complete curriculum, go to functionalgrammar.org and follow the links to Unit 4, 4th grade.)

Findings

Meaning-making took different forms in Unit 4 as a result of its focus on constructing an argument. Students needed to have knowledge of the cane toad issue and a possible solution to be able to develop an evidence-based argument in response to the issue. They also needed to understand the purpose of the argument genre and its stages in order to engage in an oral rehearsal of the argument before writing an essay. Therefore, meaning-making as defined by the written curriculum and realized in the enacted curriculum consisted of building domain knowledge (e.g., ecosystem, interdependence, invasive species) and developing an understanding of the cane toad issue itself (e.g., Australia's sugar cane crop, cane toads, meat ants, unintended

consequences), which was supported by text-based discussions. Meaning-making also consisted of learning how certain words and phrases in the text can be used to indicate how usual it is that something has occurred in the past or how likely it is that it will occur in the future. Then, this understanding of the issue and certain language features in the text were applied to the analysis and construction of an argument, which was yet another form of meaning-making.

In Unit 4, there were 90 text-based instructional episodes across seven lessons. (See Table 7.1). Of these 90 episodes, Ms. Youssef used functional grammar metalanguage in 63 episodes. In 13 of these 63 episodes, Ms. Youssef and her students used the functional grammar metalanguage (e.g., *likelihood*, *connectors*, *author's purpose*, *referent*, *meaningful chunks*) in the context of building understanding of the issue or constructing an argument. There were 37 episodes in which she used the metalanguage pertaining to the stages of an argument (e.g., *description of the issue*, *claim*, *evidence, reason*, *counterargument*, *response to the counterargument*, *restatement of the claim*) to teach the argument genre, define its stages and support students' construction of a written argument. And there were 13 episodes in which Ms. Youssef used functional grammar metalanguage (e.g., *participants*, *author's purpose, connectors, likelihood*) to bring explicit attention to the language in the text.

In 27 of the 90 text-based instructional episodes in Unit 4, Ms. Youssef supported her students' meaning-making without using functional grammar. The discussions in these episodes reflected the goals articulated in the written curriculum, which provided materials (suggested vocabulary list and power points) to aid in the building of domain knowledge relevant for the purposes of understanding the cane toad issue. In these episodes, she engaged students in being metacognitive about their understanding by asking them to reread, clarify key vocabulary, and brainstorm hypotheses about the cane toad issue. In several of these episodes, she and the

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students discussed the science of ecosystems and food webs. In 9 of these 27 episodes, she targeted the building of knowledge about the genre or specific vocabulary. In these instances of genre or vocabulary instruction, Ms. Youssef modeled, demonstrated or provided information for the students.

Table 7.1 *Unit 4 Instructional Categories and Episodes*

Unit 4	
Instructional Categories	**Number of episodes**
With FG	
Building understanding of the issue and constructing an argument using functional grammar metalanguage	13
Building understanding with and of the metalanguage of argument stages	37
Explicit attention to language using functional grammar	13
Without FG	
Building understanding of the issue without using functional grammar	18
Explicit instruction of vocabulary, genre, or attention to language without the use of functional grammar	9

The table above shows the distribution of episodes as they were organized into categories based on the primary focus of instruction at the level of an instructional episode and Ms. Youssef's use of functional grammar analysis during the episode. Throughout these episodes, her enactment of the curriculum revealed both opportunities and challenges. Next, I will turn to describing key instructional practices revealed in Ms. Youssef's enactment of the Unit 4 curriculum. Subsequently, I will discuss the opportunities for meaning-making afforded in Ms. Youssef's enactment of Unit 4 using key episodes to illustrate the intersection of the following: building domain knowledge, building understanding of an argument using the metalanguage of the stages, and the explicit attention to language using functional grammar. Then I will discuss

the challenges of this approach to supporting student meaning-making with informational science text.

Instructional Practices

During her enactment of the Unit 4 curriculum, Ms. Youssef employed a variety of instructional practices. Similar the other units, these practices consisted of modifying and supplementing the curriculum and employing various participation structures, instructional techniques and discourse moves. Again, it is helpful to conceive of these practices as nested: discourse moves situated within instructional techniques and instructional techniques situated within various participation structures. However, rather than being clearly demarcated, these practices of varying grain sizes often overlapped. The participation structures dictated various types of grouping and independent work—whole-class discussion, small group discussion, pair work, and independent work—in which various types of instructional techniques (e.g., repeated readings of text, think-alouds, think-pair-share) and discourse moves were used to support students' meaning-making with the text. Looking across the unit as a whole, there were three key practices that exemplified her attention to both language and meaning-making: developing learning objectives for both language and reading, iterative readings of text, and explicit teaching of vocabulary specific to building domain knowledge.

Objectives framed in terms of a linguistic orientation to meaning-making.

Ms. Youssef crafted her own lesson objectives, which were based on the written curriculum. She wrote a reading/content objective and a language objective on the blackboard before each lesson. At the beginning of every lesson, she gathered the students together on the floor in the front of the classroom where they could all easily see the board. She read the reading content objective to them—explaining, rephrasing and elaborating upon it—and then they read

the language objective aloud together. The written curriculum did not identify both a reading content and a language objective. This two-pronged, language and literacy objective was a product of Ms. Youssef's practice enacted curriculum. The practice of having two objectives for every lesson—a reading content objective and a language objective—is reflective of sheltered instructional practices (SIOP) (Echevarria & Short, 2004), a research-based model of instruction designed to support linguistically diverse students with which Ms. Youssef was familiar. For example, in the written plan for Lesson 1, the objectives were:

> **1**. Introduce students to the concept of an ecosystem.
> **2.** Introduce students to the cane toad issue.

For Lesson 1, Ms. Youssef's revised objectives were:

- Reading: Students will develop an understanding of an information selection by examining key words in part of it.

- Language: Students will discuss orally and summarize key ideas about an informational selection using vocabulary, such as species, predators, and intended consequence.

For Lesson 2, Ms. Youssef's revised objectives were:

- Reading content objective: Students will develop an understanding of what is an ecosystem and what would disrupt its balance.

- Language objective: Students will analyze orally and take notes about a possible solution to the cane toad invasion while referring to the ecosystem and its balance.

Notice how Ms. Youssef foregrounded the students' meaning-making in her version of the objectives. Phrases such as "develop an understanding; discuss orally and summarize key ideas using vocabulary; analyze orally and take notes while referring to the ecosystem and its balance" positioned students as strategic meaning-makers and academic language users. This was the case in all of her objectives throughout the unit. (See Figure 7.3).

Language and Meaning - Unit 4		
Lesson	Objectives as written	Ms. Youssef's objectives
1	1. Introduce students to the concept of an ecosystem. 2. Introduce students to the cane toad issue.	• Reading Content Objective: Students will develop an understanding of an information selection by examining key words in part of it. • Language Objective: Students will discuss orally and summarize key ideas about an informational selection using vocabulary, such as species, predators, and intended consequence.
2	1. Students will learn about the importance of balance in an ecosystem. 2. Students will learn about one possible solution to the cane toad problem in Australia: Meat ants. 3. Introduce the prompt students will write to.	• Reading Content Objective: Students will develop an understanding of what is an ecosystem and what might disrupt its balance. • Language Objective: Students will analyze orally and take notes about a possible solution to the cane toad invasion while referring to the ecosystem and its balance.
3	1. Students will practice identifying some of the common stages of an argument, including *claim, evidence, reason,* and *counterargument.* 2. Students will discuss the purpose of argument and discuss the reasons why the stages are important to writing a good, clear argument.	• Reading Content Objective: Students will demonstrate an understanding of the stages of an argument for the purpose of writing one. • Language Objective: Students will read as a group a sample of an argument and identify claim, evidence, reason and counter argument. Students will discuss the purpose of an argument by watching a power point about the importance of the stages.
4	1. Students will begin to see how writers of science texts choose their language carefully to be accurate about claims or predictions.	• Reading Content Objective: Students will develop an awareness to language that is used in a science argument by closely examining the text's word choice. • Language Objectives: Students will generate examples in writing of words that can be used when writing a claim or a prediction using a T-chart. Students will work in groups of three to identify evidence for or against the use of meat ants to get rid of the cane toads.

5	1. Practice finding evidence and writing reasons for why that evidence supports the claim. 2. Determine which evidence is the strongest for supporting the claim.	• Reading Content Objective: Students will develop an understanding of how to select best evidence to support their claim using strong how usual or how likely language. • Language Objectives: Students will discuss with a partner and choose evidence. Students will explain orally the reason behind their choice. Students will choose independently another piece of evidence and write it with explanation using the likelihood scale or usual scale words. Students will copy the evidence and the reasoning in a graphic organizer.
6	1. Find evidence for a counterargument. 2. Evaluate the strength of the counterargument and explain what this information means for the writer's position on the issue.	• Reading Content Objective: Students will read and evaluate many evidences and choose the best choice to engage in an oral discussion defending their choice. • Language objectives: Students will respond orally to someone's evidence and counter argue the evidence with different information from text using words from the usual and likely scale.
7	1. Co-construct a Description of the Issue 2. Students put the various writing scaffolds in order and write their ideas paragraph form on notebook paper.	• Reading/Writing Content Objective: Students will analyze important key words in two selections in order to write a summary description of an argument essay. • Language Objective: Students will work with a partner to co-construct on an introduction or description of cane toad invasion problem including appropriate participants, process and setting.

Figure 7.3. The objectives in the written plans and Ms. Youssef's revised objectives.

Through examining her articulation of the lesson objectives, we can understand how Ms.

Youssef conceived of the nature of the meaning-making throughout the unit. Her lesson

objectives indicate that she had read the lesson plan and identified not only *what* she wanted

students to learn but also *how* she wanted students to work with the content and use language to

meet the content objective. Ms. Youssef was very deliberate about composing objectives that would capture the main purpose of each lesson:

> That objective is almost the whole of my lesson. I am looking at the objective on the board. My objective is two, three lines, not one phrase. That objective is what I have planned. I peek at the objective in order to move on and catch up. Sometimes I do stop before I finish it when I realize that, okay, they are not solid; they do need more exposure. And I learned to tell them, this is not working, I need to work more so I can deliver to you better. (Ms. Youssef, personal communication, July 14, 2014)

At the end of every lesson, Ms. Youssef and her students summarized what they had learned; this included revisiting the objectives. If she felt she had not been effective in helping her students meet the objectives, she retaught the lesson or part of a lesson the next day.

Iterative readings of the text.

As in the other units, Ms. Youssef ensured that students read the text multiple times with varying degrees of scaffolding and for different purposes. Repeated readings can support fluency (Rasinski, 2010), which is beneficial for all students, particularly English learners. Beyond encouraging fluency, Ms. Youssef engaged students in rereading the text in different ways and for different purposes; these purposeful iterations provided opportunities for English learners to continually reformulate their understanding and connect the language in the text to its meanings (Larsen-Freeman, 2012).

During Lesson 1 in Unit 4, Ms. Youssef used *The Cane Toad Invasion* (O'Hallaron & Moore, 2012) text to introduce students to the problem, the life-science dilemma. To do so, she read the text with the students multiple times. Reading a paragraph at a time, she read the text aloud to the students, asked them to read it to themselves silently, and then she engaged the

students in an interactive read-aloud of the text, which was supported by the instructional dialogue scripted in the lesson plan.

At the beginning of Lesson 2, using the power point provided in the curricular materials, she reviewed the meaning of an ecosystem and explained how living things depend on nonliving things. She emphasized the importance of keeping the ecosystem in balance and then, to elicit a review of what students had read about and learned in the previous lesson, she posed the question, "How are cane toads changing the ecosystem?" By contextualizing this review in the broader concept of the ecosystem and its delicate balance, she reestablished students' awareness of the problem presented in the text and the gravity of this issue. "We want to solve a problem without causing another problem. So let's study carefully. What is our good intention? We want a good intended consequence." She showed a short video that explained the cane toad problem in Australia, and then she introduced the text, *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012).

First, she engaged the students in an interactive read-aloud of the first two paragraphs. After reading the first sentence, "Meat ants, also known as gravel ants, can be found everywhere in Australia," she elicited the term "native" from the students to characterize the meat ant, and she asked if the cane toads were native to Australia. In chorus, the students replied, "No!" She used the interactive read-aloud guide provided in the lesson plan as she held it in her hand and referred to it while teaching, but she also incorporated other elements in her instruction. She read aloud one sentence at a time, paused at the end and elicited students' thinking about specific words, phrases or ideas presented in that sentence. She clarified or elaborated upon new vocabulary or important words she knew were critical for comprehension. She also asked who the *participants* were in this first paragraph, which was not a question in the written lesson plan.

She consistently found ways to encourage students' understanding of the issue and use of scientific terminology.

After reading the first two paragraphs interactively with the students, she asked them to discuss the first paragraph with the other students at their table and underline the important information, an instructional technique that was not specified in the curriculum. This task required rereading the text and talking about it. A whole-class discussion followed in which students shared what they had determined was important. Then, she asked them to reread the second paragraph silently and discuss, in their table groups, what should be highlighted in that paragraph. A whole-class discussion followed each small group discussion, in which students were held accountable for their talk and their reasoning.

To read the third paragraph, she read it aloud to them as they followed along. Then she explained that the paragraph contained some complex ideas so she would reread it aloud again and make a mental image in her head as she did so. She thought-aloud and asked questions of the text to model for students ways they could be thinking about the ideas in this paragraph. Later, when the discussion following the reading of a paragraph indicated students' misunderstanding, she asked them to reread the paragraph independently and followed up with a question that elicited clarification from the students.

After reading the complete text in this interactive manner, with an ebb and flow from whole-class to small-group discussions, she revisited the prompt with the students. She supported them in summarizing the consequences of moving the meat ants from one place to another.

> T: We have enjoyed two reading selections. Reading is fun. Reading is interesting. There is a purpose for the information we have been studying. We are going to write an essay, an argument, showing our point of view regarding this prompt, this question: *Scientists in Australia think using meat ants might be one effective way to stop cane toads from spreading and hurting more organisms. Should the scientists use the meat ants now or should they do more research on meat ants? Why? Support your answer with details*

from the text. Before you think yes or no, remember, we talked about the ecosystem. If I remove those meat ants from spot A to spot B, who is going to improve?

Ss: B

T: Who is going to hurt and suffer?

Ss: A.

T: A, because now I am creating what in the ecosystem?

Ss: Imbalance.

In this one lesson, students were given multiple opportunities to read the text in different ways. Students read the text while they followed along, listening to Ms. Youssef read-aloud and think-aloud. They reread the text in small groups to find and discuss the important chunks of information. They reread small sections independently, silently, to clarify misunderstandings. These iterations gave students multiple opportunities to understand the text's content as well as develop familiarity with the language. The multiple readings of text may have also reduced the demands on working memory so that when students began using the text to construct their argument, their initial processing of the text and its meaning had been accommodated in earlier readings (Sweller et al., 1998). At the end of the lesson, she reminded her students of the overarching purpose for reading: to construct an argument based on evidence in these texts.

In the first two lessons of Unit 4, the students read to understand the issue. In later lessons, they read these same texts in search of evidence to support a claim and words that indicated *usuality* or *likelihood*. Each iteration was unique as Ms. Youssef set the purpose for reading according to the text and her intended meaning-making outcomes. Ms. Youssef always made the purpose for reading explicit. Although the purpose for reading shifted throughout the unit, the pattern of whole-class, small-group, whole-class discussion remained consistent.

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Think-alouds.

The practice of providing iterative readings of small chunks of text was similar in the other units. However, in Unit 4 Ms. Youssef also included a think-aloud during the students' "silent" reading. While they read silently, she read aloud again, thinking-aloud about tracking the referents, asking questions of the text, and clarifying unknown vocabulary. Through reading-aloud and thinking-aloud, Ms. Youssef modeled an internal reader's dialogue with the text, giving the students insight into how they could be thinking about the text in order to build causal/logical relations; she modeled a reader's meaning-making process, making it accessible to her students. After accompanying their silent reading with a think-aloud, she asked students to "turn-and–talk" to someone about the section they had just read.

Students read aloud.

In Lesson 4, after learning the stages of an argument in Lesson 3, Ms. Youssef and her students returned to the *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012) text. This time, their purpose for reading was to identify *usuality* or *likelihood* language and find evidence to support the claim to "act now" or "study more." They were not rereading to understand the issue as in previous lessons. Now they were rereading to analyze the author's word choice and use the information in the text to construct an argument.

In the middle of Lesson 4, Ms. Youssef employed a new instructional technique: she called on individual student volunteers to read paragraphs aloud to the class. When the text needed to be reread during a whole-class discussion, she either asked an individual student to read a paragraph aloud or she asked them to read the section silently to themselves. Ms. Youssef reread sentences aloud, too, when pointing out or reinforcing which section of text provided the

evidence, but students were now expected to read the text aloud, which had not been the case in any other unit. She maintained this practice throughout the remainder of Unit 4.

Note that these opportunities to read aloud occurred after the students had already read the text, and heard her reading the text multiple times. The familiarity with the text created a more risk-free situation for students who might otherwise be reluctant to read aloud in front of the class. Oral reading can promote fluency (Rasinski, 2010), but "round robin reading," in which students are expected to read aloud when their turn comes, has proven to be ineffective. To become fluent readers, students need to hear models of fluent reading (Rasinski, 2010). When students read aloud with a lack of fluency for the whole class, they have an opportunity to practice oral reading, but the other students are not benefiting from hearing a student struggle through a passage of text. In addition, the mandatory turn taking in round robin reading can make students focus on their turn approaching rather than the text's meaning. Ms. Youssef never employed this practice. Instead, she called on volunteers to read aloud, and there were always multiple volunteers from which to choose.

Emphasis on word meaning and word knowledge.

In Unit 4, Ms. Youssef supported students' learning of new words, including key vocabulary in the texts. In Lesson 1 of the written curriculum, the research team identified the following words from *The Cane Toad Invasion* (O'Hallaron & Moore, 2012) as potentially challenging for students:

- Species
- Native species
- Invasive species
- Predator
- Prey
- Intended consequences
- Unintended consequences

The lesson plan suggested that teachers discuss these words as they were encountered during reading. However, Ms. Youssef modified the list and chose to explicitly teach the meanings of the following words prior to reading *The Cane Toad Invasion* (O'Hallaron & Moore, 2012):

- Intended consequence
- Cane toad
- Potential
- Invasive
- Cause and effect
- Breed
- Predator
- Ecosystem
- Unintended consequence

To do so, she posted the words on the Promethean board and used questions to elicit students' prior knowledge of these words. The order of the words is logical, beginning with intended consequences and ending with unintended consequences after students have learned the meanings of the other words. After introducing these words and their meanings, Ms. Youssef revisited the meaning of words while reading the text with her students. She also encouraged students' use of this new vocabulary when talking about the text, and she herself used the vocabulary words multiple times throughout the unit; she wove them into discussions about the texts, about the issue, and about the arguments to either act now or study the issue more.

Before reading the *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012) text in Lesson 2, Ms. Youssef used the power point slides provided in the curricular materials to review the meaning of the words *ecosystem*, *balance* and *interdependence*. *Ecosystem* was a word in the text but *interdependence* and *balance* were not; all of these words encapsulated key underlying scientific concepts necessary for understanding the cane toad problem and the complexity of the

potential solution. While reading the text, Ms. Youssef highlighted and discussed words that

were crucial for understanding the meaning of the text, such as the word "possible" in the title.

The meaning of possible
(Source: Unit 4, Lesson 2D, 2:25-3:35)

1. T: I will read aloud and you will follow along. Possible Solution: Meat Ants. What is the heading telling me? What is the heading telling me? Preparing me, just by looking at the heading?

2. S1: Probably that a possible solution would be the meat ants to the cane toads, the meat ants would eat them.

3. T: What was the intention of the author? The purpose of the author, the intention? Why did the author use POSSIBLE solution?

4. S2: Because possible is like probably.

5. T: Possible is like probably. Are they sure—

6. S3: No.

7. T: —this is going to be a solution?

8. S3: No.

9. Ss: No.

10. T: Let's find out.

     This episode illustrates how Ms. Youssef attended to word meaning, beyond those words

identified as key vocabulary, in the text. The word "possible" was not identified in the

curriculum as a key vocabulary word but like the words "interdependence" and "balance of the

ecosystem," the word "possible" is critical for understanding that this solution may not work.

     She also provided opportunities for students to use vocabulary words to discuss the text

by asking them to find the meaningful chunks of words in the text. After reading the sentence,

"Meat ants, also known as gravel ants, can be found everywhere in Australia," she reread, "can

be found everywhere in Australia" and asked, "Children, what does this chunk tell me?" (This was not part of the interactive read-aloud in the lesson plan.)

S1: Like, all over Australia.

T: Alright, what does that make the ant? What type of species?

S2: It can eat the cane toads.

S3: it's an Australian species.

T: An Australian. When you are belonging to a certain land, what do we call you? We used that word yesterday.

Ss: Native.

T: Native! Beautiful. (Picking up the chalk and writing the word "native" on the board) so those meat ants are natives of Australia.

Throughout the unit, Ms. Youssef consistently raised students' awareness of word level meanings by stopping and talking about particular words in the text or by asking students to use vocabulary words to discuss the text. Even in reading the objectives, she rephrased words or elaborated upon a phrase to ensure students' understanding of the learning goals. This suggests Ms. Youssef utilized multiple learning contexts within each lesson to reinforce students' word learning and word knowledge.

Summary of instructional practices.

Ms. Youssef employed many practices over the course of Unit 4. In my analysis, I focused on three practices that exemplified her attention to both the language and the reading comprehension aspects of English learners' meaning-making with informational science texts: developing learning objectives for both language and reading, iterative readings of text, and explicit teaching of vocabulary specific to building domain knowledge. She wrote and made explicit a two-pronged learning objective for each lesson: one objective for language and one

objective for reading/content. These dual objectives suggest that a linguistic orientation to meaning making includes the explicit articulation of learning goals that address English learners' language and reading comprehension development. As she acknowledged in the interview, the objectives encapsulate the whole lesson. To synthesize an entire lesson into one reading and one language objective requires a teacher to be very clear about what students should learn and how language will facilitate that learning.

Her attention to her students' language and reading comprehension needs was also evident in how she read the text with the students. Students had the opportunity to read each text in Unit 4—*The Cane Toad Invasion, Possible Solution: Meat Ants*—multiple times for various purposes. As described above, in Lessons 1 and 2, these iterations took the form of repeated readings of small sections of text. Through listening to Ms. Youssef read-aloud and think-aloud, reading silently, reading aloud, and reading to find the important chunk of information, students had multiple opportunities to work closely with the text in highly scaffolded ways. Later in the unit, they reread the texts for markedly different purposes: to find evidence, to identify and analyze words that communicated *usuality* or *likelihood*, to deconstruct the stages of argument, and understand how an author organizes an argument. With this practice of iterative readings of the text, Ms. Youssef created new contexts in which students could re-encounter the language in the text (Larsen-Freeman, 2012) and deepen their understanding of the concepts as the causal/logical relations (Van den Broek & Kremer, 2000) were reinforced through her discourse moves that made the central concepts and ideas explicit.

The ways in which she scaffolded students' vocabulary development also reflected a linguistic orientation to meaning-making. She incorporated instruction of individual words— both key vocabulary and other important terminology central to the issue—throughout the

reading and discussions about the texts. In Unit 2, she pre-taught vocabulary necessary for analyzing and describing characters. Similarly, in Unit 4, Ms. Youssef pre-taught scientific vocabulary that was necessary for understanding and discussing the life-science issue more broadly (e.g., interdependent, balance) even if the words were not in the text. To *use* a text to construct understanding and form an argument *about* the text requires having knowledge of key concepts that are related to the text and a cognitive network of related vocabulary that communicates those concepts (Kintsch, 1998).

Opportunities for Meaning-Making with Functional Grammar

As explained above, the first two lessons in Unit 4 were designed to support students' understanding of the cane toad issue and the possible solution of using meat ants. The lesson plans provided a model of an interactive read-aloud with which teachers could lead their class through a discussion of the text and emphasize the learning of unknown vocabulary. Ms. Youssef's enactment of Lessons 1 and 2 closely reflected the written lesson plans, but with some added attention to the language in the texts. Although Lesson plans 1 and 2 did not include any reference to functional grammar, Ms. Youssef incorporated functional grammar analysis into the interactive read-alouds in four episodes. With her attention to vocabulary described in the above section and her use of functional grammar analysis, she brought a close attention to language into her instruction aimed at supporting students' reading comprehension. As this attention to language was not specified in the written lesson plans, these data also suggest Ms. Youssef used functional grammar analysis flexibly and opportunistically in her instruction to support the students' establishment of the causal/logical and referential relations that were central to understanding the texts.

Using functional grammar analysis to reinforce meaning.

The episode below illustrates how Ms. Youssef seized the opportunity to discuss the connector "but" and what it signaled in the last sentence of the first paragraph of *The Cane Toad Invasion* (O'Hallaron & Moore, 2012). The first paragraph in *The Cane Toad Invasion* read as follows:

> In the 1930s, farmers in northern Australia had a big problem: beetles were eating the sugar cane crop. Sugar cane is a plant that sugar is made from. It is an important **crop** for Australia. To stop beetles from destroying the sugar cane, scientists brought the South American cane toad to Australia. They thought the toads would eat the beetles. But the plan didn't work.

But the plan didn't work
(Source: Unit 4, Lesson 1A, 31:16-33:31)

1. T: So who brought this animal (referring to the cane toad) into Australia?

2. Ss: Scientists.

3. T: Now when they brought it, what was their INTENTION? The scientists' intention? What was the intended consequence? The scientists brought the cane toad for what reason?

4. S1: The intention was, the consequences was—

5. T: The intended consequence—

6. S1:   [consequence] was that they brought the cane toads so they could eat the beetles—

7. T: Where did you find that information? Come point to the board (where the text is projected)

8. S1: (pointing to the text on the board) "They thought the toads would eat the beetles."

9. T: OK, so when they were THINKING that they might eat, did they do it? Or they were planning on doing it?

10. Ss: They planned it.

11. T: So that was their INTENDED outcome, the possibility. Did it work?

12. Ss: No.

13. T: How do you know?

14. Ss: Because it says, "But the plan didn't work."

15. T: OK, so when the author said, "But, the plan didn't [work]"

16. S2:   [connector]

17. Ss: Connector.

18. T: We said we're not just going to call them connectors. We have to explain what is the purpose of having that connector. (rereading) "But the plan didn't work." What is the author doing to me?

19. S3: Giving you an idea.

20. T: Giving me an idea. What else?

21. S4: Making you keep reading the selection.

22. T: OK, any other ideas?

23. S5: They are telling you what happened.

24. T: (rereading) OK. "They thought the toads would eat the beetles. BUT," as if they are alerting me, now be careful, "But the plan didn't work."

The exchanges that occurred in lines 1 through 11 prefaced the discourse about the word "but." She used the new vocabulary, *intended consequences*, to talk about the meaning of the text (lines 1-11), and then she brought students' attention to the meaning they were making (line 11-12) and how they were constructing this meaning (line 13-15). In response to students initiating the identification of "but" as a *connector* (lines 16-17), she pressed them to articulate the purpose

of "but" in this part of the text (line 18). Students offered several ideas (lines 19, 21, 23), none of which was inaccurate, but based on her response to them (line 24), it seemed as if Ms. Youssef wanted to make the point that "but" was being used to alert the reader. In this episode, the students used the functional grammar metalanguage without prompting from Ms. Youssef. The students used the metalanguage of *connector* to identify and label a word in the text, and then Ms. Youssef responded to them by emphasizing that they need to do more than identify the feature; they need to know *why* an author chooses to use such a word. She reinforced the fact that "but" was used to alert the reader (line 24).

The way in which Ms. Youssef responded to her students in this episode illustrates how functional grammar differs from traditional grammar. Functional grammar analysis gives readers opportunities to understand the function of particular words, their meanings, and the underlying reason for an author's word choice. Traditional grammar does not offer an approach to text analysis that connects the identification of a word (or a group of words) with its purpose and its meaning or its presence as a realization of a choice the author made. Ms. Youssef's response to her students in this episode suggests that she knows functional grammar analysis is not simply about labeling parts of speech; she is aware of how functional grammar analysis can be used to analyze language, its meaning and the function it serves in the text, and she wants her students to understand this as well.

In Lesson 2, there were more examples of this seamless weaving of an explicit attention to language in the text while reading to understand the issue. In the episode below, she engaged students in rereading the second half of the first paragraph in *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012) to ensure students understood the interdependence among the meat

ants and the caterpillars and butterflies. She used the metalanguage of *participants* and helped

students track the participants through drawing attention to the referent word *they*.

Possible solution: Meat Ants

Meat ants, also known as gravel ants, can be found everywhere in
Australia. You can find them in sunny, moist areas living in
underground nests of over 64,000 ants. Even though they're called meat
ants, they mostly eat honeydew from certain caterpillars and
butterflies. In return, the ants protect the caterpillars from **predators**.
So why are they called "meat" ants?

Key words signal interdependence
(Source, Unit 4, Lesson 2D, 7:15-8:56)

1. T: What are we seeing here? We have an ecosystem where we have the cane toads and we have the meat ants and now we have another participant. So we have four involved now: the caterpillars, the butterflies, the meat ants, and the cane toads. Read this with me (pointing to the fourth line): "They—" Who are they?

2. Ss: The meat ants.

3. T: The meat ant. "—mostly eat honeydew FROM certain caterpillars and butterflies." Look at this part (pointing to the beginning of the next sentence). "In return—"

4. S1: To get it back to the sentence.

5. T: To go back to the sentence, to elaborate, to tell me further more information. "The ants—" What do they do in return?

6. Ss: Protect.

7. T: --caterpillars from predators." I protect you, you feed me. What is happening here in that small ecosystem?

8. S2: They exchange (crossing his arms to illustrate the word 'exchange').

9. T: They are [exchanging services.]

10. S3:   [Interdependence.]

11. T: What are they?

12. Ss: Interdependent.

A few exchanges later, a student asked, "Is 'in return' a connector?"

Ms. Youssef replied, "In return can be a connector, yes, but we don't care about naming a connector. As he said (pointing to S1), this word will signal to me that there is a connection between the two clauses or the two sentences."

In the episode above, Ms. Youssef brought students' attention to the referent 'they' (line 1). In doing so, she modeled the tracking of referents, which establishes referential coherence (Van den Broek & Kremer, 2000), and supported students in clarifying the participants (line 2). In response to her highlighting the phrase 'in return,' it was not clear what S1 was intending by his explanation when he said it meant 'to get it back to the sentence' (line 4). It seemed he was suggesting that 'in return' meant to go back to the preceding sentence, which Ms. Youssef accepted, but this interpretation of the meaning of the connector 'in return' was infelicitous. Ms. Youssef recast the question in reference to the ants, 'What do they do in return?' (line 5). Contextualizing the *connector* 'in return' with the *participant* and the *process* reinforced the logical relations (Van den Broek & Kremer, 2000). Multiple students responded with the answer 'protect.' With her question about what was happening in this small ecosystem (line 7), she elicited students understanding of the relationship between the organisms (line 8) and created an opportunity for students to use the scientific vocabulary, *interdependence,* that she had taught at the beginning of the unit to describe this relationship.

After reading the first and second paragraphs together as a whole class, discussing the text along the way, and addressing the questions written in the interactive read-aloud in the lesson plan, Ms. Youssef asked her students to reread the first paragraph and identify the key

pieces of information with each other at their tables. She did not refer to this task as functional

grammar analysis, but when a student asked if they should identify a word or a group of words,

she confirmed they should look for groups of words. Students had become accustomed to her

encouraging them to look for "meaningful chunks."

> Meat ants, also known as gravel ants, can be found everywhere in Australia. You can find them in sunny, moist areas living in underground nests of over 64,000 ants. Even though they're called meat ants, they mostly eat honeydew from certain caterpillars and butterflies. In return, the ants protect the caterpillars from **predators**. So why are they called "meat" ants?
>
> They are named "meat" ants because farmers have used them to clean the bodies of dead animals. In fact, they can even kill some live animals.

After discussing at their tables, students shared what they had determined were the key

ideas in the first paragraph. Then they discussed the second paragraph with one another and

determined the key ideas in it. When the students shared out, Ms. Youssef underlined the key

ideas in the text, which was projected on the Promethean board. She took a moment to model a

strategy for tracking referents:

T: What do you think is very important in this paragraph to keep in mind?

S1: The farmers use the meat ants to clean dead bodies of animals, like scavengers.

T: OK, so (underlining the text as she spoke) "used them to clean the bodies of dead animals." I like to use a technique, a strategy. Sometimes *it*, *them*, *they* confuses me so I am going to draw an arrow here (drawing an arrow above the word *them*) and I'm going to remind myself who [is] them?

Ss: The meat ants.

The exchanges above are characteristic of how, in text-based instructional episodes in

Unit 4, Ms. Youssef consistently brought explicit attention to the language in the text, clarified

referents, unpacked the meaning of words, elicited the purpose words serve, and helped students establish causal/logical and referential coherence. The lesson plans did not suggest she bring explicit attention to the language; she did so of her own accord. This attention to language occurred within the larger context of reading and discussing the text to build students' understanding of the life-science issue. She supported the construction of meaning through shared, repeated readings of the text, discussing the language, and eliciting students' ideas about both the language and the science concepts.

Explicit attention to language in service of constructing an argument.

In Lesson 4, Ms. Youssef introduced the metalanguage of *likelihood* (e.g., can, don't often, will likely, could) and *usuality* how often something has occurred in the past (e.g., mostly, usually, most of the time, rarely). In the text the students just read in Lesson 2, *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012), the authors used various likelihood and *usuality* words to communicate the degrees of certainty of events. Lesson 4 was written to guide students in learning this metalanguage and becoming aware of these words so that they could recognize how particular words in science texts can be used to indicate degrees of certainty and how arguments are often constructed using this language as well. This language of likelihood and *usuality* enables scientists to make reasonable claims about the chances of something occurring.

Ms. Youssef's students were preparing to construct an argument in response to the prompt: *Scientists in Australia think using meat ants might be one effective way to stop cane toads from spreading and hurting more organisms. Should Australia use the meat ants now or should they do more research on meat ants? Why? Support your answer with details from the text.* Ms. Youssef scaffolded the process of finding evidence in the text to support an argument by asking students to find evidence in support of using meat ants. There were several challenges

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that arose during this lesson, which will be discussed later, but there were also instances in which the discussion about the text, evidence and the language of likelihood converged to create a rich opportunity for synthesizing the understanding about the language, the evidence stage of an argument, and the cane toad issue itself. This synthesis is exemplified in the episodes below. A student read the following excerpt aloud:

> For example, meat ants are able to kill live cane toads. When a cane toad is attacked, it usually sits still and lets the **poison** in their skin kill the attacker, but it seems the cane toad's toxins do not hurt the meat ants because the ants are able to kill the toad while it just sits there.

As the students began discussing the text excerpt in small groups at their tables, Ms. Youssef listened. After about one minute, she stopped them and complimented them on how well they were discussing but, as she pointed out, they were not referring to the text as evidence and they needed to do so.

T: When scientists do research and study, they are constantly referring to the text. They are constantly looking at evidence, words, statements, meaningful chunks and likelihood, usual words. I am not seeing anyone referring to the text. I am seeing just arguments. I want you to refer to the text and give me a very high level answer.

After students further discussed the excerpt, she called them back together and asked for volunteers to share their thinking.

Evidence: Meat ants can kill cane toads
(Source: Unit 4, Lesson 4B, 46:46-48:18)

1. T: So what do you want scientists to do?

2. S1: Act now.

3. T: Act now. Why?

4. S1: Because it says in the article, for example, meat ants are able to kill live cane toads. When a cane toad is attacked, it usually sits still and lets the poison in their skin kill the

attacker, but it says it seems it doesn't hurt the meat ants, the toxins from the cane toad doesn't hurt the meat ant because the meat ant does not have the taste of the toxins when they kill the cane toads.

5. T: OK, I am going to counter argue with you. Thank you, wonderful (to S1). I am going to say we need to study more and the reason I am going to say study more, look at this (pointing to the text on the board) but it SEEMS. It SEEMS the cane toad's toxins do not hurt the meat ants. It SEEMS. How certain are they?

6. S2: Not that much.

S1 incorporated Ms. Youssef's directions. She articulated her claim and referred to specific evidence in the text to support her argument (line 4). The lesson plan was written to encourage students to find evidence and then determine which claim it supported: act now, study more or do both. So Ms. Youssef's counterargument (line 5) modeled for students how this same piece of evidence could also support the claim that they should study this situation more.

For the remainder of the lesson, Ms. Youssef and the students continued to read *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012) and *The Cane Toad Invasion* (O'Hallaron & Moore, 2012) using a similar instructional cycle as seen in the above episode: she called on a volunteer to read a paragraph, and asked the students to discuss, in groups at their tables, the evidence and likelihood/usuality words in each paragraph. Then she asked for volunteers to share their thinking and determine if the evidence supported one of the claims—act now or study more—or if it could be used to support both claims. The following episode occurred twenty minutes after the one above; students had begun trying to identify the likelihood/usuality metalanguage and use it to support their reasoning. She called on a student to read the following paragraph:

> Meat ants don't often kill **native** toads. Meat ants eat during the day, and many native toads come out at night instead of the day. Plus, native toads know to hop away from the meat ants.

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Discussing evidence, the issue and likelihood
(Source: Unit 4, Lesson 4D, 00:25-2:30)

1. T: OK, I asked you to discuss here and look for strong usual words or strong how likely future words. And what part of evidence you think you have found here through your discussion. Go ahead, Nadia.

2. S1: It says right here (reading) meat ants don't often kill native toads.

3. T: OK, so in what category are you going to put that?

4. S1: For often, it will be in the how likely in the future but it's not as high. It's in between high and in the middle.

5. T: So what's your stand on that issue? Do you want to study it more? Do you want to act know? Give me an explanation.

6. S1: I want to act now because it says that meat ants don't often kill native toads. They don't kill native toads they only kill the cane toads.

7. T: (restating) Don't often kill native toads so you want to act now. OK, who can argue against her? She wants to act now. (rereading) Meat ants don't often kill native toads. Where is the weakness here? Sara.

8. S2: The weakness is often.

9. T: The weakness is often. So somebody might argue with you, they don't OFTEN. There is a probability or a possibility that they might kill native toads. Remember, we discussed the ecosystem and we do not want to harm the ecosystem.

In the episode above, Ms. Youssef facilitated a brief discussion about what the students had found during their reading of this section of the text. She framed the purpose so that the focus of the discussion was clear: to share the usual or likely words and the evidence (line 1). S2 shared the sentence she thought could be used as evidence (line 2). Then Ms. Youssef asked her which category it would fall into (line 3). Since they were engaged in categorizing the evidence as supporting the argument to "act now" or "study more," this question could have been intended to elicit this categorization. However, S2 proceeded to categorize the word "often" in terms of

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the likelihood it implied (line 4). Using the likelihood scale posted on the board, the student accurately plotted it somewhere between a high and a moderate occurrence. However, the phrase "don't often kill" refers to usuality (i.e., how often this has occurred in the past) not likelihood (i.e., what scientists were predicting for the future), but Ms. Youssef did not spend any time clarifying this here. She continued to press the student to identify which argument this piece of evidence supported (line 5).

S1 claimed that this evidence supported the argument to act now, and in her explanation, she rephrased the sentence, omitting the word "often" to support her argument (line 6). Ms. Youssef replied by restating the key phrase that S1 had used as evidence, "don't often kill native toads" and clarifying which claim S1 had said would support "act now." Then she opened the discussion up to the rest of the class by asking who wanted to argue with S1, and more specifically, where the weakness was in the evidence S1 had chosen (line 7). Ms. Youssef called on S2, who pointed out that the word "often" weakens the "act now" argument (line 8). Ms. Youssef confirmed S2's contribution by reiterating the uncertainty implied in the word "often" and reminding the students of the risk involved: the health of the ecosystem and the potential of harming it (line 9). The students in this episode demonstrated an understanding of the word "often" and how it shaped the meaning of the evidence and influenced the arguments under consideration.

Summary of opportunities for meaning-making with functional grammar.

The opportunities for meaning-making with text in Unit 4, exemplified by the episodes from Lessons 1, 2 and 4 above, were discussion-based instances in which Ms. Youssef and her students paid close attention to the language in the text to co-construct knowledge of the cane toad issue and respond to this issue through the building of an argument. Ms. Youssef used

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functional grammar analysis (e.g., attention to *referents*, *participants*, *meaningful chunks*) flexibly and opportunistically in her instruction to support the students' establishment of the causal/logical and referential relations that were central to understanding the ideas in the texts. The episodes analyzed above illustrate how, at this point in the year, students were recognizing linguistic features (e.g., connectors) and initiating discussions in the whole-class context about their meaning. Students also had multiple opportunities to work together in small groups to determine the meaningful chunks in each paragraph. The metalanguage of likelihood and usuality was introduced in this unit. It was taught explicitly, and then applied to the evaluation of evidence in the text and its ability to support one or both of the two possible claims: act now or study more. In the first four lessons of this unit, students were asked to learn about a life-science issue, the argument genre, and the usuality/likelihood metalanguage. The remaining lessons required students to apply their knowledge of 1) the issue, 2) the structure of an argument, and 3) the usuality/likelihood metalanguage in the construction of their own argument.

Challenges of Using Metalanguage in the Context of Teaching Argument

In Unit 4, the written curriculum attempted to support teachers in their instruction of a familiar process (argumentation) in a new context (arguing about a life-science issue). The students were familiar with argumentation from Unit 2 and other "take a stand" opinion writing they had done in their classroom, but some of the argument stages (e.g., description of the issue, counterargument) in Unit 4 were new. Additionally, each phase in this unit—the building of domain knowledge, the introduction of the metalanguage of usuality and likelihood, the teaching of the stages of an argument, the construction of an argument—was complex, and this complexity was compounded; students were expected to continually apply the learning from one lesson to the next so the unit grew in its complexity over the duration of the lessons.

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In this section, I will discuss the primary challenges that arose, which became evident in Lessons 4 and 5: 1) misunderstanding the function of usuality and likelihood; 2) evaluation of evidence without connection to the claim; and 3) a lack of coherence between the claim, evidence and reason. Again, these challenges were evident in Ms. Youssef's enactment, but as I will discuss below, the source of confusion may have been how some of the concepts were presented in the curriculum itself. The first two challenges arose in Lesson 4, a pivotal lesson in which students were expected to integrate and apply new metalinguistic knowledge.

Prior to discussing each of the challenges, I will explain why Lesson 4 was so demanding. Then I will situate the discussion of these challenges within an analysis of sections in the written plan versus episodes in the enacted plan. Episodes from Lesson 4 were referred to in the above sections on the practices and opportunities revealed in Ms. Youssef's enactment of the curriculum. Here, aspects of Lesson 4 will be treated with an analytical lens that enables us to see the challenges in integrating a focus on language when teaching argumentation with science texts. Then, I will discuss the third challenge, a lack of coherence in the stages of the argument, which arose in Lesson 5.

A task with high-element interactivity.

Although the chronology of the unit was logical and reflective of research on teaching how to construct an argument (Christie, 2012), the cumulative effect of the lessons likely produced tasks that placed high demands on both the teacher and the students. From a cognitive perspective, the task of *integrating knowledge about likelihood words to determine the strength of a piece of evidence to support a claim*, which students were expected to do in Lesson 4, would be considered a task with high-element interactivity (Sweller et al., 1998). Sweller explains: "Material that is high in element interactivity is hard to understand because understanding

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requires working memory to process many interacting elements simultaneously, rather than serially" (Sweller et al., 1998, p. 265). An example of a low-element interactive task would be learning individual vocabulary words. Although the lesson plan for Lesson 4 attempted to break down the complex task of *integrating knowledge about likelihood words to determine the strength of a piece of evidence to support a claim* into a series of steps, the cognitive demands on the students were significant at this point in the curriculum. The evidence to support this claim is in both the written curriculum and the classroom discourse in episodes from Lesson 4. I will first turn to an analysis of a section in the written lesson plan, followed by several episodes that illustrate this challenge.

The Lesson 4 plan.

The first part of Lesson 4 was designed to help teachers introduce the metalanguage of how "usual" or how "likely" and the heuristic of the likelihood scale (Figure 7.2). In the second part of Lesson 4, students were expected to apply this new learning to evaluate a piece of evidence in terms of its strength and determine which claim (act now or study more) it could support. Below is the excerpt from the written curriculum that attempted to break down this task of *integrating knowledge about likelihood words to determine the strength of a piece of evidence to support a claim*.

2. Transition to collecting evidence from the Meat Ants text. Tell the students that it's important to pay close attention to these "usual" and "likely" words as we look at evidence. Remind students of the prompt and then introduce the Evidence organizer and explain its structure (See Evidence_Chart.docx and EvidenceChart_Key.docx).

    i. *"In this first box, we'll write down facts from the Meat Ants text and the Cane Toads text to support our claims. Then, we'll put a check whether we think that evidence supports the different answers (it could support multiple answers!)."*

3. Ask students to partner up and find a part of the Meat Ants text that provides evidence they could use to support the claim that using meat ants is a **good** option. Ask students to see if they can find any words that tell how *usual* or *often* something happens. Model one example first...

    i. First, call on a student who chose the following evidence: that the meat ants can kill the toads. Push them to include all of the relevant information that explains how/why the meat ants are able to kill toads (the toads usually just sit there and let their poison kill the attacker, but the poison doesn't affect the meat ants). Also, ask students why all of these go in one box of evidence as opposed to being in separate boxes (all of these sentences are related and therefore should be used as one piece of evidence).

    ii. Ask students if there are any *usual* or *likely* words in this evidence. ("Don't move" sounds like it always happens when attacked. "are able to kill" also sounds like it is high on the scale. So, this evidence is pretty strong. These events seem to be very *usual* or common.

    iii. Talk about which claims the evidence they chose could support and why (Good, act now or Good, study more).

In the excerpt from the written plan above, there is a progression of analysis suggested in the steps: 3) find evidence to support the use of meat ants; i) emphasize the importance of the whole meaningful chunk; ii) identify usual and likely words to determine the strength of the evidence; iii) discuss which claims the evidence could support and why.

There are two flaws with this progression as it was written in the curriculum. Step 3.ii, determining the strength of a piece of evidence based on the author's use of words that indicate the usuality or likelihood of an event, is problematic. Evidence is not weak or strong independent of its argument. If something occurs frequently, it doesn't necessarily equate to strong evidence,

and the opposite is true as well; an event's infrequency does not equate to weak evidence. For example, if I am making the argument that my neighbor who lives in a small apartment with no backyard needs to take better care of her dog, a Great Dane, and one piece of evidence for my argument is, "She only walks her dog occasionally," my evidence provides strong support for my argument. The usuality words "only" and "occasionally" indicate that she does not walk her dog often. These "less intense" usuality words do not make the evidence itself less intense or weak; this is a strong piece of evidence. The infrequency of the dog's exercise indicated by the usuality words strengthens my argument for the neighbor to take better care of her dog.

The second flaw in the progression is the last step, step 3.iii: "Talk about which claims the evidence they chose could support and why (Good, act now or Good, study more)." It is true that both claims "act now" and "study more" were considering meat ants as a solution. Both claims implied the desire to get rid of cane toads; the "act now" claim was more assertive than the "study more" but neither one was suggesting *not* getting rid of the cane toads with the use of the meat ants. However, without explicitly foregrounding a claim and finding evidence to support one claim or the other, students were being asked to find evidence that could support either claim, which proved to be confusing. Perhaps it would have been helpful to have the conversation about the underlying assumption: there is some promise in using the meat ants; the question is how confident we are in that action. Because they were using usual and likely words, the metalanguage could have addressed degrees of confidence in using the meat ants. However, the subtlety in the concept of certainty, along with the newly acquired metalanguage of likelihood, introduced levels of complexity that made the teaching of these concepts more difficult than the research team anticipated. In fact, the degree of challenge presented in this unit was not clear until analyzing Ms. Youssef's enactment.

In addition, in section 2.i in the written lesson plan (above), the word "answers" is somewhat misleading. I know, having been involved in the writing of the curriculum, this is probably referring to answering the prompt. However, in the same paragraph with the word claim, it implies that the claim and the answer might be two different things when, in fact, the answer to the prompt *is* the claim.

Lesson 4 enactment challenges.

In her enactment, Ms. Youssef broke Lesson 4 into four sessions, which, in total, consisted of two hours and 30 minutes of instruction. The first session, in which she introduced the usuality and likelihood metalanguage, lasted 56 minutes and 23 seconds. In the remaining three sessions, which took a total of 92 minutes and 49 seconds of instructional time, Ms. Youssef supported students in the task outlined in the written curriculum above; this is the task I am referring to as *integrating knowledge about likelihood words to determine the strength of a piece of evidence to support a claim.* During these last three sessions, she and the students worked through the *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012) text to find evidence; the episodes from these sessions illustrate the challenges of 1) misunderstanding the function of usuality and likelihood, and 2) evaluating the evidence without connection to the claim.

Misunderstanding the function of usuality and likelihood.

One source of confusion may have been Ms. Youssef's own understanding of the function of the usuality and likelihood metalanguage. The written curriculum and professional development may not have provided adequate support for understanding why authors use these words and how such words influence the text's meaning. Just prior to the instructional episode discussed below, the students had learned about the usuality/likelihood scale (Figure 7.2). As a

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result, they could find the usuality words in the text, and they understood where they fell on the scale from frequent/certain to infrequent/uncertain. They even seemed to understand how these words modified the facts presented in the text; but the challenge arose when they needed to determine the "strength" of the evidence based solely on the intensity of the likelihood without considering how it could support a particular claim. In the episode below, Ms. Youssef was launching the second session in Lesson 4 in which students would evaluate the strength of evidence based on usuality or likelihood words.

Reviewing the likelihood scale
(Source: Unit 4, Lesson 4B, 1:06-5:40)

1. T: We were discussing, before we went to music, the likelihood scale and we practiced with some of the examples I brought you about scientists and how careful they use the language. And we explored some expressions. When I am used to doing something, it's a usual; it's a habit; maybe it's less frequent; maybe it's a high frequency. So these words [pointing the scale on the blackboard] indicate how usually I do something. Is it always, is it sometimes, is it rarely. Because you have to use these words in the sentence. If you are not one hundred percent sure of your data, if you want to say a statement in your argument and you want to convince someone of your point of view, which one you want to use? A high likely word or a very low likely word. If you want to convince someone?

2. S1: A high one.

3. T: A high one. Do you want to use words like most times, always, many times or do you want to say, it rarely helps, barely can do it.

4. S2: High.

5. T: We always want to aim for high if we want to be convincing someone. And also when your data is not one hundred percent sure, these words are going to help you a lot. You can convince by saying, it should be able to provide so and so. Or you might say, I do not recommend this. It may not help this matter.

6. When you pull out your evidence, what words are you going to focus on?

7. S3: Likely.

8. S4: Extremely

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9. S5: Should.

10. S6: Possible.

11. S7: May not.

12. T: OK, who said may not? Jafar, why did you pick may not, which is a very low likelihood?

13. S7: Like if you say it may not rain today.

14. T: OK, but you are writing an argument and you want to prove to your friend that something might work.

15. S7: Like if you write something and say, this solution may not work.

16. T: Thank you. You might say the solution may not work.

In the episode above, Ms. Youssef communicated the following: words that indicate high degrees of "how usual" and "how likely" strengthen an argument. However, as I explained above with the Great Dane example, this is not always the case. When S7 suggested the phrase "may not," she questioned him, pointing to the fact that "may not" is a phrase that implies low likelihood (line 12). When he defended his thinking (line 15), she accepted it, but she did not elaborate on it. This could have been because she thought that he did not understand, and she could not take the time to rectify this misconception; or perhaps she did not elaborate upon his thinking because his defense was plausible. S7 indicates the kind of thinking that should have been supported in this discussion because the degree to which an event is likely does not directly correspond with its ability to persuade. It would depend upon how the phrase is used, the context, and the argument to which it is connected.

Evaluation of evidence without connection to the claim.

When selecting and discussing pieces of evidence, Ms. Youssef referred to the evidence as being weak or strong without clarifying which claim the evidence was supporting. Without the

connection between the evidence and the claim (either "act now" or "study more"), it was difficult to determine whether a piece of evidence was weak or strong. As the written curriculum had suggested, she had made it clear that a piece of evidence could support either claim and sometimes the same piece of evidence could be used to support both claims, but when students identified evidence, the discussion about the evidence did not yield clear reasoning about the possible logic of the argument. Terms such as "weak" and "strong" were used to classify the evidence without knowing why a piece of evidence was strong or weak and for which claim.

Ms. Youssef revisited the prompt with the students: *Scientists in Australia think using meat ants might be one effective way to stop cane toads from spreading and hurting more organisms. Should Australia use the meat ants now or should they do more research on meat ants? Why? Support your answer with details from the text.* Then she asked her students to read the first paragraph in the Meat Ants text (below), study this paragraph, and determine if there was any evidence in it. Students offered several ideas.

> Meat ants, also known as gravel ants, can be found everywhere in Australia. You can find them in sunny, moist areas living in underground nests of over 64,000 ants. Even though they're called meat ants, they mostly eat honeydew from certain caterpillars and butterflies. In return, the ants protect the caterpillars from **predators**. So why are they called "meat" ants?

First attempts at finding evidence
(Source: Unit 4, Lesson 4B, 14:53-17:29)

1. S1: They mostly eat honeydew from certain caterpillars and butterflies.

2. T: What am I fighting with those meat ants? What am I using these meat ants for?

3. Ss: To kill the cane toads!

4. T: To get rid of the cane toads. So if the meat ants are eating certain caterpillars [honeydew], is that going to be strong evidence so far?

5. S1: No.

6. T: No, so I want you to discuss what would be good evidence here.

(Students discuss.)

The sentence S1 chose could be evidence for "studying more." If the ants mostly eat honeydew, how likely are they to eat cane toads? Ms. Youssef initially rejected this contribution (lines 4-6), but she eventually saw the validity of it at the end of this instructional episode, which the transcript later reveals (lines 14-16).

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7. T: OK, do you have evidence?

8. S2: The evidence is "In return, the ants protect the caterpillars from predators."

9. T: Who agrees? (S3 raises his hand.) OK, why, why is this good evidence?

10. S3: This is good evidence because it tells us that meat ants are strong animals because when someone's protecting someone from another thing, it's strong.

11. T: OK, but this is not data. This is your explanation. And in science we want evidence. That's a good interpretation but we want evidence. So no, we are not going to take that. What is another evidence?

12. S4: "You can find them in sunny, moist areas."

13. T: Why would that be good evidence? If I find them in sunny areas, how is this going to help me to prove they can get rid of cane toads?"

Line 4 above and this last statement (line 13) indicate that she wanted students to find evidence for using the meat ants to get rid of the cane toads. It is true that both claims "act now" and "study more" were considering meat ants as a solution for getting rid of the cane toads. Both claims implied the desire to get rid of cane toads. Therefore, the way she guided the students to find evidence to support getting rid of the cane toads could have, in essence, helped them locate evidence for either argument, but she was not explicit or consistent with this being the task.

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There seemed to be an underlying assumption that a "strong" or "good" piece of evidence would advocate for the "act now" claim as we can see in the transcript continued below.

She drew students' attention to the following sentence from the paragraph above: "Even though they are called meat ants, they mostly eat honeydew from certain caterpillars and butterflies. In return, the ants protect the caterpillars from predators."

14. T: For this chunk, do you think this is strong evidence, I can act now? Or do you think I need to study it more? (Students discuss.)

15. T: So what is the agreement? Should we research more or should we take that evidence? Study more or act now?

16. S5: Study more.

Returning to the first line in this episode, S1 suggested that the sentence, "They mostly eat honeydew from certain caterpillars and butterflies" was evidence. Ms. Youssef had rejected this evidence based on the assumption that it did not support getting rid of the cane toads. But then at this point in the discussion, she posted this same line as evidence to be considered (lines 14 and 15). She asked, "For this chunk, do you think this is strong evidence, I can act now?" This question equates strong evidence with "acting now," which implies that weak evidence supports the "study more" argument. Again, this would make sense if, at the beginning of this lesson, Ms. Youssef had positioned the class to build an argument for acting now. In that case, any evidence that could be used in the "act now" argument would be considered strong *for that position*, but this was not the task in her instruction or in the written lesson plan; as a result, qualifying evidence as weak or strong/good became a confusing task. Students concluded that this sentence was evidence for studying more (line 16). Then, as was suggested in the lesson plan, she asked students to copy these lines from the text into the box on their evidence organizer, a blank version of the Evidence Chart Key (Figure 7.4) below.

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The written curriculum emphasized the fact that the same piece of evidence can support either claim. In the excerpt below from the written lesson plan (above), step 2 read:

2. Transition to collecting evidence from the Meat Ants text. Tell the students that it's important to pay close attention to these "usual" and "likely" words as we look at evidence. Remind students of the prompt and then introduce the Evidence organizer and explain its structure (See Evidence_Chart.docx and EvidenceChart_Key.docx).
   i. *In this first box, we'll write down facts from the Meat Ants text and the Cane Toads text to support our claims. Then, we'll put a check whether we think that evidence supports the different answers (it could support multiple answers!).*

(The word "answers" is misleading. This should have been "claims.") The difference between choosing a piece of evidence for the argument to "act now" or the argument to "study more" would be in the reasoning and how the author chooses to use that evidence, how the author points to aspects of the evidence that strengthen their argument. So in looking for evidence, the curriculum suggested to find the evidence (facts) and then decide if it supported both claims or which claim it supported. We provided the following "key" as a guide.

Evidence: A piece of information from the text that supports...	**Act now**	**Study more**
Meat ants are able to kill live cane toads. The cane toads don't move when attacked. It seems the cane toad's poison does not hurt the meat ants. So the meat ants can attack the toad while it just sits there.	X	X
Almost no other species of toad live in these areas.	X	X
Even though they're called meat ants, they mostly eat honeydew from certain caterpillars and butterflies. In return, the ants protect the caterpillars from **predators**.		X
Meat ants live in nests with over 64,000 ants.	X	X
Most of the time, attacks by the ants killed the cane toads immediately. If toads escaped half eaten, most of them died within 24 hours.	X	X
In these experiments, damage to other living things appears to be		

low, but scientists don't know for sure. Getting the ants to move to cane toads' ponds will likely lower the number of ants in other places. This could change the **behavior** of other living things in the **ecosystem**.		X
Female toads can lay 35,000 eggs at a time!	X	
They became serious **predators** of several kinds of Australian insects. Each toad can eat about two and a half times its body weight in one day—that's a lot of food!	X	
Even worse, nothing could stop them because cane toads are very **poisonous** when eaten. Predators like lizards, snakes, crocodiles, and even household pets began to die because they were poisoned when they tried to eat the toads. Scientists have found that many animals are **at risk** because they don't know that eating the toads will kill them	X	

Figure 7.4. Completed evidence organizer provided in the Unit 4 materials.

On the one hand, it is important for students to learn that the same piece of evidence can be used to support both claims. On the other hand, to approach selecting evidence with the idea that it could support either claim requires students to entertain both sets of reasoning simultaneously; it makes the development of a coherent argument more challenging. If time had allowed, perhaps it would have been more beneficial to build both arguments separately. The curriculum also could have offered the possibility of a third claim: do not use the meat ants, and in the end students could see that, depending on their reasoning and the ways they use the evidence, the same pieces of evidence can be used to support any of these claims: act now, study more or don't use. If we were to approach the teaching of an argument in this way, the fact that the same piece of evidence could be used to support multiple claims would be realized in hindsight, rather than attempting to select evidence in general before determining your claim.

Lack of coherence between the claim, evidence, and reason.

In Lesson 5, Ms. Youssef followed the lesson plan closely. To scaffold the process of learning how to construct a reason to explain how a piece of evidence supports a claim, she asked all of her students to consider the same piece of evidence in support of the "act now" claim. The evidence was: "Almost no other species of toad live in these areas." On the graphic organizer provided with the lesson plan (see Evidence/Reason Graphic Organizer in Appendix A), the reason was described as: How or why does this evidence support your claim? How and why does the evidence help or hurt the cane toad problem?

She gathered students together on the floor and asked them for reasons she should act now. Here is where meaning might have begun to break down. They had been talking about the evidence, "Almost no other species of toad live in these areas," but then this question did not elicit a connection between the reason and the evidence in support of the claim to "act now."

Developing a reason to explain how the evidence supports the claim
(Source: Unit 4, Lesson 5A, 21:13-27:43)

1. T: OK, what do you think the reason I should act now? Look at this evidence: Almost no other species of toad live in these areas. Why should I act now?

2. S1: If we act now, if we don't then the cane toads might have more babies—

3. T: And what is the proper word for that?

4. S1: They might breed—

5. T: Well done! Beautiful. So [writing on a piece of butcher paper on the blackboard] cane toads might breed more. Well done. Discuss, give me another strong reason. Why should I act now? (Students discuss.) Now remember, when you are thinking of your reason, remember the reason explains how the evidence supports the claim. Hadiya, give me a reason, a strong one.

6. S2: If we don't act now, other animals will eat the toads and they will die. But if we act now, the ants will stop this.

7. T: I think you are a bit confused. We said we're going to act now because almost no other species of toad live in these areas. This is your evidence. You are always looking at the evidence. Look at it. Almost no other species live in these areas. And we are going to bring to that area the meat ant so explain the reasoning behind your claim.

8. S2: If we act now, there will be [xxx] because there's going to be more ants.

9. T: How do you know?

10. S2: Because when [xxx] there's gonna be a whole bunch.

11. T: OK and what's going to happen. How is this supporting your claim?

12. S2: The ants will solve the toads.

13. T: OK, [returning to the notes on the butcher paper] cane toads might breed more. Another reason. What's your reason? (to Hadiya) The meat ant…

14. S2: The meat ant can stop the cane toads.

15. T: Isn't your reason like this one? Isn't their job to eat the cane toad? (S2 nods) OK, thank you. Think of another reason.

> S2's reason did not seem to connect to the evidence, "Almost no other species of toad live in these areas" but neither did S1's reason (line 4). It is not clear why Ms. Youssef accepted S1's reason but not S2's.

16. S3: If the meat ants don't act now, the sugar cane will all be destroyed and they can't support their country.

17. T: Do you agree with his reasoning? We have to think about the sugar cane? So what should we say?

18. S4: But the cane toads are making more problems.

19. T: That one you counter argue with him. Right now, we are pretending that we are all agreeing with this. Right now we are practicing. You have the right to disagree later on. But now let's pretend we all want to bring the meat ant because this is our evidence. So his reasoning is, if we don't act now, what?

20. S3: We can't export sugar cane and we can't provide money for our country.

21. T: OK (writing it on the butcher paper) if we don't act now, Australia will not be able to export sugar cane that provides—strong evidence, wow, uh reasoning—money for the

country. I love the wording too. Reason. How and why does the evidence support my claim? Yes, we want to act now. So how is this (pointing to the evidence on the Promethean board), I want a reason that supports this. So far we have two: the cane toad might breed a lot so we need to act now and we might lose our income for Australia because we export the sugar cane. What would be another reason that is going to encourage me using this evidence to act now. Discuss.

Again, the connection between S3's reason and the evidence is not clear. However, she accepts it and compliments him for this contribution.

The students discussed another possible reason among themselves and then a student offered a third reason: If we don't act now, then the cane toads will kill all the animals and we won't have any food, which she accepted with a slight modification. Rather than saying, "wouldn't have any food," she suggested they revise it to read that this would affect the ecosystem. None of the three reasons offered were connected to the evidence provided. They were all sound reasons on their own, but they missed the point, which was to explain why the evidence, "Almost no other species of toad live in these areas," supported the claim to act now. The coherence between the evidence, the reason, and the claim was not reinforced in this episode or at any other point in the lesson.

Conclusion of challenges.

In Unit 4, three primary challenges arose: 1) misunderstanding the function of usuality and likelihood; 2) evaluation of evidence without connection to the claim; and 3) a lack of coherence between the claim, evidence and reason. The first two challenges were most evident in Lesson 4 in which the task was to *integrate knowledge about likelihood words to determine the strength of a piece of evidence to support a claim*. The third challenge of understanding the relationship among the claim, evidence and reason became evident in Lesson 5. The tasks of analyzing the usuality and likelihood language within the context of analyzing evidence, constructing an argument using evidence from the text, and developing reasons to support the

connection between the evidence and the claim proved to be complex endeavors for both Ms. Youssef and the students. Cognitive learning theory and the data from both the written curriculum and the enacted curriculum suggest that perhaps, because so much of the information in this unit was new to the students and their schema for many of these ideas had not yet been developed, the demands on their working memory were high, especially when considering the language learning that was occurring simultaneously (Sweller et al., 1998). Both the written curriculum, and Ms. Youssef in her enacted curriculum, attempted to reduce the demands on students' working memory by ensuring the connection from one concept to the next was explicit.

Ms. Youssef attributed some of the challenges in Unit 4 to the fact that the argument structures in Unit 2 and 4 differed. In her reflection log, Ms. Youssef commented on how this difference made Unit 4 more difficult to teach (Youssef, Unit 4, reflection log). If the structure and metalanguage had remained the same and if the counterargument stage had not been introduced, this unit would have presented fewer demands as students would have been able to rely upon the structure and argumentation metalanguage with which they had become familiar in Unit 2. As an inherent aspect of design-based research, the evolution of the curriculum was intended to provide better support for teaching and learning. The difference in disciplinary focus in Unit 4, as compared to Unit 2, necessitated a different argument structure (i.e., no interpretation of attitudes was needed in the science argument). The research team's focus on developing instructional theory that brought out the affordances of SFL was in conflict with what might have been 'good pedagogy' for this group of learners, as Ms. Youssef experienced it. As Ms. Youssef pointed out, changes in the curriculum from one unit to the next can be a disadvantage when consistency may be more supportive of students' understanding. Further piloting of the materials and/or providing additional professional development regarding the

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likelihood metalanguage and the argument genre may have ameliorated some of these challenges. A more extensive curriculum may also have given students the opportunity to advance their knowledge of the issue.

Conclusion

Unit 4 was the culminating unit of the *Language and Meaning* curriculum in the third year of the project. With the use of two informational science texts, *The Cane Toad Invasion* (O'Hallaron & Moore, 2012) and *Possible Solution: Meat Ants* (Moore & O'Hallaron, 2012), this unit was designed to support students in learning about a real life-science dilemma and developing an argument based on the information presented in the two texts. It required intertextual analysis and learning of the stages of an argument in the discipline of science, including a counterargument stage. By far, this unit was the most complex unit in the curriculum.

As in the previous units, principles of SFL (Christie, 2012; Martin & Rose, 2008) were translated into a functional grammar to support teachers' literacy instruction and students' ability to learn from texts. In Unit 4, there were two primary ways in which functional grammar was used to support the curricular goals. First, the functional grammar metalanguage of *usuality* (i.e., how often something has occurred in the past) and *likelihood* (the degree of certainty that it will occur in the future) was introduced to help students notice the ways in which authors of science texts express the frequency with which an event or situation has occurred in the past or the probability of it occurring in the future. In addition to introducing students to the metalanguage of *usuality* and *likelihood*, the SFL theory of genre stages was drawn upon to provide both a purpose and a structure for the development of a logical argument in which students could use text-based evidence and the rhetorical move of a counterargument to support a claim. These

genre stages informed the design of the lessons aimed at familiarizing students with the argument genre in the discipline of science and supporting their construction of a written argument.

In this study of Unit 4, I addressed the following question: What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific instructional practices, tell us about the opportunities and challenges of a functional grammar approach to supporting student' meaning-making with informational science text?

Instructional Practices

Looking across the unit as a whole, there were three key practices that emerged: clarifying learning goals, supporting students' iterative reading of the texts, and explicit attention to word meaning. In her enactment of the curriculum, Ms. Youssef transformed the learning objectives into language-centered, meaning-making endeavors that she made explicit to the students at the beginning and end of each lesson. Within various participation structures, she provided multiple opportunities for students to reread and revisit the texts for different purposes. With iterations, the language in the text was referenced and used to construct causal/logical and referential relations. She explicitly taught new vocabulary words and supported students in using scientific vocabulary when discussing the text.

Opportunities for Meaning-Making

Key episodes were identified in which meaning-making occurred at the intersection of 1) building domain knowledge, 2) building understanding of an argument using the metalanguage of the stages, and 3) the explicit attention to language using functional grammar. Analyses of these episodes suggest that Ms. Youssef reinforced the meaningful application of functional grammar analysis within text-based discussions focused on meaning-making. In classroom discourse, when students recognized a text feature (e.g., connectors), she responded with the

press to not merely label the word but to determine its function in the text. Attention to language, whether initiated by a student or Ms. Youssef, occurred within the larger context of reading and discussing the text to build students' understanding of the life-science issue. Discussions about the text and the language of likelihood converged to create rich opportunities for synthesizing students' understanding about the language and the cane toad issue itself.

Challenges of Using Metalanguage in the Context of Teaching Argument

In the analysis of the challenges, the complexity of the unit became apparent. The demands of this unit required cumulative learning and immediate application of newly learned concepts on both linguistic and conceptual levels. Many of the challenges that arose in Unit 4 may have been the result of the limitations in the written curriculum or the professional development, which may not have provided teachers with enough experience relative to the relationship between the likelihood metalanguage and the stages of an argument. In her final reflection log, in response to the question, "Were the FG features clearly explained in the PD?", Ms. Youssef acknowledged her limited knowledge and her need for further support:

> After starting teaching the unit, I realized that I needed more support with the implementation of the counterargument. More written examples and more time to practice the oral counterargument session. The selections require a lot of research or some background knowledge about some organisms. I lacked that knowledge. Hence, the session's time was not enough for me to grasp the topic and the application. I highly recommend that we email the participants the upcoming selections to read before the workshop. Just like a required reading for upcoming class lecture at the university. (Youssef, Unit 4, reflection log)

Ultimately, to craft a well-reasoned argument for the life-science dilemma presented in this unit, students needed to understand that there are always trade offs that scientists need to think about when attempting to respond to environmental issues. To develop this understanding over the course of seven lessons was a great undertaking, one that Ms. Youssef embraced, to the best of her ability, with conviction.

Implications

For teachers to adopt a linguistic orientation to meaning-making with informational science texts in support of English learners' literacy and language development, they need to think about the kinds of reasoning in which students are expected to engage when reading about a science topic and the language that is required to develop reasoning skills relative to that topic. To understand a life-science dilemma, students need opportunities to build domain knowledge and knowledge of the issue itself. For Ms. Youssef, ensuring students had multiple opportunities to read and discuss the texts began with determining both a language and reading learning objective for every lesson. To build scientific knowledge through the reading of texts, students need to be explicitly introduced to the vocabulary that is central to the ideas and concepts in the text and in the domain more broadly (Cobb & Blachowicz, 2014). The process of reading to build knowledge requires careful scaffolding (Pearson & Fielding, 1991), which can occur through interactive readings of shared texts (Kucan & Palincsar, 2013) and iterative readings for multiple purposes (Larsen-Freeman, 2012); with each iteration, the purpose for reading needs to be clear and explicit. Drawing attention to language features specific to science texts involves teaching students how authors use language to communicate degrees of certainty relative to their hypotheses and claims (Christie, 2012). Understanding how words such as *often*, *most likely*, *seems*, and *rarely* can be used to modify the certainty of an event helps readers attend to the

nuances embedded in informational science texts. Recognizing the ways in which likelihood can be realized in text also gives students the opportunity to incorporate this language into their own expressive vocabulary.

However, it can be challenging to couple the analysis of likelihood with teaching students how to use informational science texts as sources for evidence in an argument. The purpose of an argument and the author's claim should drive the selection of evidence. To evaluate how well a piece of text-based evidence will support their claim, readers can use their knowledge of how authors encode degrees of certainty in terms of likelihood, but this should be done to understand degrees of certainty, not the strength of the evidence. A high degree of certainty does not necessarily make a piece of evidence strong, and a low degree of certainty does not necessarily make a piece of evidence weak. The strength of a piece of evidence is determined by how well it supports the claim. Therefore, the quality of a piece of evidence should not be evaluated in isolation.

The relationship between the stages of an argument needs to be reinforced when preparing students to write so that students can learn how to build a logically coherent argument. In breaking down the construction of an argument, there is a risk of compromising the coherence that helps it hang together. As with any complex process, the moment you start to parse it into discrete steps, there is the risk of losing sight of the big picture. The links, which enable the steps to cohere into one complex process, become disjointed. But without parsing the process somehow, it remains too complex to teach in any kind of systematic way. With the awareness of these challenges, teachers can be more cognizant of how to use functional grammar and argumentation metalanguage to help English learners understand how to construct causal/logical relations in an argument.

CHAPTER 8: DISCUSSION

Linguistic diversity is one of the hallmarks of the "New Mainstream" classroom (Enright, 2011), but for years now, English learners have not been faring well in U.S. schools, particularly in the area of reading comprehension (NAEP, 2013). In response to this problem, literacy and language scholars are calling for mainstream classroom teachers to adopt a linguistic orientation to meaning-making (Fillmore & Snow, 2000; Han & D'Angelo, 2009; Schleppegrell, 2010; Turkan et al., 2014). A linguistic orientation to meaning-making requires teachers to approach reading comprehension instruction with awareness and knowledge of the linguistic demands students face when reading and responding to academic texts. Such an approach necessitates explicit attention to the language in instructional texts and a systematic way of talking about "how language means" (Halliday, 1993). *Systemic Functional Linguistics* (SFL) offers a sociolinguistic theory of language development (Halliday, 1978) and a metalanguage for talking about the functions and features of language at the level of the word, the clause, and the whole text (Martin & Rose, 2007) that can be used to inform reading comprehension instruction for English learners.

In the current study, SFL informed the design of an English language arts curriculum that supported a teacher's linguistic orientation to meaning-making. This approach was called *functional grammar analysis*. To better understand the instructional practices teachers need to employ, the opportunities afforded, and the challenges teachers might face when adopting a linguistic-orientation to meaning-making with text, I studied one fourth-grade teacher's (Ms. Youssef's) enactment of this curriculum over the course of a year. My research question was:

What does the close study of one teacher's enactment of a curriculum that featured functional grammar analysis, including her specific instructional practices, tell us about the opportunities and challenges of a functional grammar approach to supporting students' meaning-making with text? To address this question, I employed qualitative methods including the collection and analysis of video and audio records of 24 lessons, observation field notes, Ms. Youssef's seven reflection logs, an interview with Ms. Youssef, and a document analysis of the written curriculum. The construction of this case revealed that, on the one hand, Ms. Youssef's enactment of the Language and Meaning curriculum was unique; it reflected the interaction among the written curriculum, her pedagogy, and her students (Remillard, 2005). At the same time, the patterns of practice that emerged from the study of her enactment point to areas worthy of future research. Because the practices she employed consistently created opportunities for English learners' meaning-making with text, some of these practices may help teachers translate a linguistic orientation to meaning-making into a pedagogy.

This embedded case study consists of four enacted units of instruction. For each unit, the above research question was tailored to the genre of the text (e.g., narrative fiction or informational science) that was central to that unit of study. In this chapter, I synthesize the findings. I discuss the instructional practices in connection with the opportunities for meaning-making they afforded, and then discuss the challenges that emerged as a result of Ms. Youssef's enactment of the Language and Meaning Year 3 curriculum. Then, I discuss the implications including what Ms. Youssef's enactment reveals about a linguistic orientation to meaning-making in general and what it suggests about how teachers can support English learners' reading achievement. Finally, I conclude with the study's limitations and directions for future research.

Synthesis of Findings

In each preceding findings chapter, I presented the findings from my analysis of Ms. Youssef's instructional practices, opportunities for meaning-making, and the challenges that arose as a result of her enactment of the Language and Meaning curriculum. In this section, to surface the practical implications of a linguistic orientation to meaning-making, I connect the key instructional practices with the opportunities they afforded and summarize the challenges relative to the metalanguage used in narrative texts, the language of science, and the metalanguage of argumentation.

Instructional Practices Yield Opportunities for Meaning-Making

The ways in which Ms. Youssef created the opportunities for meaning-making, the practices in which she engaged, were assumed to be a reflection of her decision making process. These practices were the observable ways in which she used, modified and supplemented the curriculum to attend to the learning goals and her students' needs. Instructional practices also consisted of the varied *discourse moves*, *instructional techniques,* and *participation structures* she employed. These practices were nested within one another: discourse moves were often the result of particular instructional techniques that were situated within a chosen participation structure. These practices were both deliberately planned and fluid, coexisting and overlapping in her instruction.

Discourse frameworks.

Ms. Youssef employed two primary discourse frameworks specific to the genre of the instructional texts: a progression of analysis with narrative texts and interactive read-alouds with informational science texts. Both approaches served as frameworks within which she could ask questions that guided students through a process of closely attending to the language and the

meanings in short text excerpts to construct causal, logical, and referential relations (Van den Broek & Kremer, 2000) and incrementally build a coherent mental representation of the text (Kintsch, 1986; Tzeng et al., 2005). These patterned, systematic instructional frameworks provided a predictable structure that organized the flow of teaching and learning. A linguistic orientation to meaning-making requires a structure within which it can become realized as a pedagogy.

Meaning-making discourse with narrative texts.

In Units 1 and 2, meaning-making with narrative fiction text consisted of learning how to analyze characters, which was determined by the text's genre (narrative fiction) and consisted of interpreting and evaluating characters. The discussions with narrative text followed a patterned line of inquiry, a progression of analysis, which was supported by the questions on the three-column organizer and the series of questions associated with each text excerpt in the lesson plans. Ms. Youssef used the three-column organizer to scaffold her students' analysis and document their meaning-making in a visual way. This ensured opportunities to identify the *process*, interpret a character's attitude, and evaluate a character's personae. In Unit 1, as suggested in the lesson plans, she also incorporated questions such as, "How do you know?" to elicit students' reasoning.

The following key discourse moves supported the learning goals with narrative texts:

- framing the functional grammar analysis (i.e., identifying the *process*) in kid-friendly terms,

- the repetition and rephrasing of questions to elicit students' identification of the *process* and explicit linking of the meaning of the process to the evaluative question "What does 'it' show me about what kind of people they are?",

- using the students' L1 in opportunistic ways to support understanding,

- asking students to justify their evaluations of the characters,

- eliciting multiple opinions, and

- listening and responding to students' contributions in ways that scaffolded language development and accuracy of meaning.

With the narrative texts, Ms. Youssef encouraged a variety of interpretations and consistently directed students' attention to the language in the text to substantiate their interpretations and evaluations for the overarching purpose of analyzing the characters.

Meaning-making discourse with informational science texts.

In Unit 3, meaning-making consisted of building conceptual understanding of scientific concepts. In Unit 4, meaning-making consisted of building domain knowledge, building knowledge of the issue, and building knowledge of the argument genre. Again, the text's genre (scientific informational text) and the overarching purposes for reading shaped the meaning-making episodes. In Units 3 and 4, the curriculum was designed to support interactive read-alouds. As a result, Ms. Youssef and the students read the text together as she embedded critical questions at stopping points throughout the texts. Stopping points in the texts and questions were scripted in the lesson plans. Ms. Youssef adhered to many of these stopping points and questions, but she also allowed herself to depart from them to provide additional, explicit support for word learning and the integration of previously learned material with the new ideas presented in the texts.

The following key discourse moves supported the learning goals with informational science texts:

- reviewing of previously learned material and vocabulary words,

- eliciting a summary of key ideas from the students,

- directing students' attention to *who* or *what* is involved in the *process,*

- asking questions that require students to clarify or elaborate upon their ideas,

- asking explicit questions about explicit information in the text,

- drawing students' attention to author's attitude and craft (e.g., through a focus on the meaning of connectors),

- referring back to the text,

- rephrasing of questions in multiple ways,

- thinking aloud about how she makes meaning with the text,

- refraining from evaluating students' ideas and instead, following up with another question,

- translating particular questions or text segments into Arabic,

- highlighting and clarifying endophoric referents (e.g., they, this),

- responding to students' questions about linguistic features, and

- pressing students to connect metalanguage with the purpose it serves.

When facilitating students' reading of informational science texts, Ms. Youssef's instructional dialogue supported students' engagement with the text, the visual demonstrations, drawings and hands-on experiences for the overarching purpose of construction of logical and referential relations (Van den Broek & Kremer, 2000) and conceptual understanding.

The curricula, and Ms. Youssef's enactment of the curricula, addressed the genre-specific challenges presented in texts. In reading different genres, we construct meaning in different ways because the purpose for reading changes the way in which we read. Through her enactment of the curriculum, Ms. Youssef made these differences explicit for students and their discussions reflected these differences.

Functional grammar analysis.

The functional grammar analysis was integrated into the progression of analysis with narrative texts and the interactive read-alouds with informational texts. Initially implicit, functional grammar analysis drew students' attention to the words in the text that were central to the essential meanings presented in a clause. Once students became familiar with how to identify what was happening in a clause and make inferences based on those 'happenings,' the functional grammar metalinguistic term *process* was taught explicitly. Throughout all four units of instruction, metalinguistic terms were defined; examples were provided; and then students had many opportunities to develop their metalinguistic awareness as they became accustomed to hearing the metalanguage in Ms. Youssef's instructional discourse and responding to her questions about the features in texts.

Ms. Youssef's attention to language was explicit and consistent throughout Ms. Youssef's enactment of all four units of instruction. To teach her students how to analyze characters in narrative fiction text, Ms. Youssef used her knowledge of *processes* to help students hone in on the meaningful chunks within a clause. With the metalanguage of *attitude* (*positive*/*negative*, *turned-up*/*turned-down*), Ms. Youssef supported her students' understanding of individual words explicitly stated in the text as well as characters' attitudes that were implicitly stated through *doing* or *saying processes*.

To facilitate students' building of conceptual understanding with informational science texts, Ms. Youssef used the metalanguage of *participants*, *processes* and *connectors* to clarify and reinforce the logical relations in explanations of scientific phenomena. To support her students in deciphering the author's attitude and degrees of confidence in author's claims, Ms. Youssef used the metalanguage of author's *attitude, usuality* and *likelihood*. To teach students

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how to critically respond to text, she scaffolded students' understanding of the purpose and structure of the argument genre. To help students construct an argument in response to both narrative fiction and informational science texts, Ms. Youssef used metalanguage for the stages of the argument genre (*claim*, *reason*, *orientation to evidence*, *evidence*, *counterargument*, *evaluation*, *interpretation*) during class discussions, which supported the oral rehearsal of students' written arguments. Throughout the four units of instruction, Ms. Youssef's use of metalanguage supported students' close attention to the language in text and the text's meanings.

Heuristics and visual tools.

The progression of analysis with narrative texts and interactive read-alouds with informational science texts were supported by visual graphics that helped students track their meaning-making. With narrative text, Ms. Youssef used a large, butcher paper version of a three-column graphic organizer to display 1) the meaningful chunks of text under analysis, 2) interpretations of characters' attitudes, and 3) evaluations of characters' personae. The attitude line, which was displayed on a large piece of butcher paper, served as heuristic with which Ms. Youssef facilitated discussions about characters' attitudes and the meaning of individual attitude words. In tandem with reading the informational science text in Unit 3, Ms. Youssef and her students drew diagrams of the atom and the battery, and in small groups, students built a simple circuit with a battery, wires, and a light bulb. Ms. Youssef also co-constructed a visual graphic called a "tree map" to clarify the causal relations between each scientist and his contributions. In Unit 4, the poster of the likelihood/usuality scale helped students understand how certain words and phrases communicate different degrees of certainty. Ms. Youssef referred to the likelihood/usuality scale when facilitating discussions about how authors use particular words in informational texts to convey their confidence in a hypothesis or a claim.

The heuristics and visual tools were a central part of the written and enacted curriculum: the attitude line, the three-column organizer, and the usuality/likelihood scale. These were the products of the research team's iterative design process, and they became central to the instruction. The centrality of these heuristics and visuals suggest that metalanguage use becomes more explicit and less abstract when it is used to represent text meaning graphically for students. Hence, a linguistic orientation to meaning-making requires more than a focus on the words or language in texts; it also requires finding a way to represent the features, functions, and nuances of language visually. Thus, these visual representations can become a record of the discussion about meaning, serve as a reminder of this meaning-making to students, provide opportunities for discussing interpretations, and can later support students' writing. As in Gibbons (1998, 2005, 2015) work with science and hand-on experiences, language serves as the medium, the teacher's scaffolding serves as the bridge between everyday English and academic English, and the hands-on experience is the reference point the student and teacher can point to as the source for discussion about the ideas or concepts. With the Language and Meaning curriculum, the visual graphics that were developed as students explored text meaning were often the reference point used to clarify students' understanding about individual word meaning or reinforce the connection between the text and students' inferences (Moore & Schleppegrell, 2014).

Varied participation structures.

Although a small-group participation structure may provide more opportunities for English learners' oral language use (Klingner et al., 1998), whole-class discussions allow the teacher to provide scaffolding and guidance for all students (Van den Broek & Kremer, 2000). In addition to supporting the reading comprehension process, whole-class discussions that focus on short pieces of text provide opportunities for English learners to encounter language in the text

multiple times, listen to how language is used to talk about texts, and use language to negotiate meaning. Regardless of students' English language proficiency, whole-class discussions allow all students to experience language use and be immersed in an environment rich with written and oral academic language, which promotes overall literacy and language development (McKeown & Beck, 2006).

As much as the present case study serves as evidence for the affordances of whole-class participation structures, there is also evidence for the affordances of integrating pair work and small-group configurations within the whole group context. In Unit 1, the consistent use of the whole-class structure and the iterative use of the progression of analysis helped students learn how to analyze text excerpts. Ms. Youssef used the progression of analysis in Unit 2 as well, but rather than directing one large discussion with the whole class, she often asked a question and then asked students to turn-and-talk to one another. This highly structured ebb and flow between whole-class and pair work supported a gradual release of responsibility (Pearson & Gallagher, 1983) as every student had multiple opportunities to generate and articulate ideas about the text in Unit 2. In Units 3 and 4, Ms. Youssef maintained the ebb and flow between the whole-class structure and opportunities for pair and small-group work.

Iteration.

Across the four units, Ms. Youssef ensured students reread the text many times and in several ways with varying degrees of scaffolding. This rereading, which provided multiple exposures to the text for the purpose of constructing deeper and more actionable forms of understanding, was not mere repetition. Larsen-Freeman (2012) refers to this practice as *iteration*: "[…] what is learned through iteration are not simply meaningful patterns, but the process of shaping them appropriately to fit the present context" (p.204). In the present study,

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every time Ms. Youssef revisited small portions of text for the purpose of analysis, she created opportunities for students to reinforce their understanding of the metalanguage, the text's language, and the text's meaning. In Units 2 and 4, when students reread the texts to select evidence to support their claims, they were not merely rereading for meaning but to choose a segment of text that could support their reasoning.

Iteration gives students multiple opportunities to make meaning and to evolve those meanings as their understanding of the language deepens, incrementally supporting a coherent mental representation of the text (Van den Broek & Kremer, 2000). "It is through iteration that we create options that give us choice in how we make meaning, position ourselves in the world as we would want, understand the differences which we encounter in others, and adapt to a changing context" (Larsen-Freeman, 2012, p. 207). Iterative, purposeful readings of text support the evolution of development, which is not isolated or static but rather social and dynamic (Vygotsky, 1978; Wertsch, 1991). Reading comprehension itself is a social, dynamic process that requires an instructional approach that facilitates readers' flexibility and dynamism in the meaning-making process (Wilkinson & Son, 2011). Through iterative reading of the texts and iterations of analysis, Ms. Youssef provided many opportunities for English learners to develop their understanding of the text, the language, and how to approach text-analysis.

Explicit reading comprehension and language goals.

Opportunities for English learners' meaning-making are made possible, in part, by setting up the conditions for learning with clearly stated goals. This requires studying the curriculum and assessing students' needs to develop learning objectives that address both reading comprehension and language goals. Ms. Youssef's objectives, which positioned students as meaning-makers and language-users, were made explicit at the beginning and end of every

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lesson. In addition to reviewing the objectives at the end of a lesson, this study suggests the importance of concluding each lesson with questions that elicit a summary of the key ideas presented in and learned from the text.

Explicit vocabulary instruction.

It is known that all learners, especially English learners, benefit from explicit vocabulary instruction (Lesaux, Kieffer, Faller, & Kelley, 2010). Whether Ms. Youssef provided explicit vocabulary instruction to support students' use of interpretive and evaluative language as in the case of preparing to analyze characters in literary texts or building students' domain knowledge in science, this study suggests that it may be helpful to frontload explicit vocabulary instruction that introduces English learners to specific words students will encounter in the text *and* words they will need for discussing and understanding the concepts in the text. Ms. Youssef brought attention to word meaning during reading by using strategies such as replacing an unknown word with a known word, connecting text to prior experiences, and translating words or text excerpts into Arabic. The teaching of vocabulary is part of a linguistic orientation to meaning making. Functional grammar analysis provides a way to go beyond word meaning; the explicit attention to language provided by functional grammar analysis and explicit vocabulary instruction are complementary practices.

Cross-cutting practices.

In summary, across all four units of instruction, to support both reading comprehension and language learning, Ms. Youssef employed the following practices:

- reading the learning objectives aloud,

- scaffolding discussions about the text,

- highlighting the language of the text,

- reading small, select portions of the text at a time,

- including all learners in the discussion through a whole-class participation structure,

- creating opportunities for all students to talk about the text in pairs or small groups,

- using visual and graphic aids to help build causal/referential coherence and strengthen the language/concept connection, and

- providing multimodal ways (reading, speaking, writing, role-play, hands-on experiences) to interact with the text or ideas represented in the text.

As an example of the instantiation of a linguistic orientation to meaning-making, Ms. Youssef's enactment makes evident the need for a predictable, systematic framework for text-based discussions that provide scaffolding for English learners' literacy and language development. Through discourse moves that attend to genre-specific linguistic features and practices that provide English learners with multiple, multimodal opportunities to engage with texts in meaningful ways, teachers can create learning environments that are rich with opportunities for meaning-making.

Challenges With Metalanguage and Language

Ms. Youssef's enactment of a linguistics-informed curriculum also revealed challenges specific to learning and working with functional grammar metalanguage, the language of science, and argumentation metalanguage. In Unit 1, the primary challenge she encountered was with teaching process types. After introducing the metalanguage for process, in the subsequent lesson she tried to teach the four process types (*doing*, *saying*, *sensing*, *being*). Students had difficulty identifying the different processes in the text, and the task quickly became disconnected from the overall meaning-making purpose. In response, she decided to focus on students' mastery of the *doing process*. She retaught the *doing process* using supplemental

materials (e.g., the pantomime video). Ms. Youssef's decision to focus on the doing process reveals her knowledge of which linguistic features are central to students' meaning-making with narrative text. Indirect characterization is often expressed through doing processes (Moore & Schleppegrell, 2014). The curriculum had placed a heavy emphasis on the doing processes in Unit 1 for this reason. This finding suggests that the metalanguage should be introduced in smaller portions.

In Unit 3, the primary challenge was with the language in the science text. Typically, the language in science texts is challenging for readers because it is laden with technical vocabulary, abstract concepts, and linguistically complex sentences (Fang & Schleppegrell, 2008). The text for Unit 3 was written to reflect these challenging aspects of science texts, and the unit was designed to help teachers engage students in the use of functional grammar analysis, among other tools, to meet these challenges. Although functional grammar analysis can be a tool for unpacking meaning in texts, it may not always be the most direct way to facilitate students' connections between hands-on experiences in science and science texts. In some instances in Unit 3, questions aimed at helping students build logical relations *without* the use of metalanguage or attention to language in the text were more efficient and supportive of students making connections between the concepts presented as realia and the concepts in the text. Teachers need to be able to use functional grammar analysis flexibly and opportunistically in service of meaning-making goals alongside other practices that can support students' construction of conceptual understanding.

In addition to functional grammar analysis, Ms. Youssef employed other instructional techniques, such as asking students to draw upon their prior knowledge to support word learning, but this has limitations as well. In attempt to make some of the technical vocabulary more

accessible to her students, Ms. Youssef encouraged students to use their prior knowledge. For example, she reminded them of when they had encountered the word *conductor* in other contexts, but in these other contexts, *conductor* held different meanings. Although readers need to leverage prior knowledge to comprehend text (Kintsch, 1998; Van den Broek & Kremer, 2000), Ms. Youssef's enactment reveals that when learning scientific vocabulary, thinking of words as they are used in other contexts may lead to anthropomorphizing scientific concepts, which can lead to misconceptions (Cervetti et al., 2009).

In Units 2 and 4, the lessons were designed to help students leverage what they had learned about reading narrative text or informational science text respectively, apply those text analysis skills to the reading of a novel text, and respond to the text/s in the form of a written argument. The writing component in Units 2 and 4 made these units more complicated. On the one hand, the staged structure of the argument made the features and the organization of the target genre explicit. On the other hand, in addition to the functional grammar metalanguage, the metalanguage of the stages added another layer of complexity. As illustrated in Unit 2 when Ms. Youssef struggled to explain how to develop a reason and in Unit 4 when the usuality and likelihood metalanguage was conflated with evaluating the strength or weakness of evidence, the instructional demands of these units necessitated more time for implementation than was allotted. The examination of the challenges Ms. Youssef encountered in her enactment of the Language and Meaning curriculum can inform future iterations of the curriculum, professional development, and future research.

Implications

Ms. Youssef's enactment of the Language and Meaning curriculum illustrates one instantiation of a linguistic orientation to meaning-making. In general, it revealed that teachers

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can use functional grammar analysis as an instructional approach to facilitate a focus on the language in instructional texts within the context of meaning-making. Functional grammar analysis requires teachers to have knowledge of genre-specific linguistic features and knowledge of how those features exemplify the central meanings in text (Fang & Schleppegrell, 2008). It also necessitates knowledge of how a focus on those features is connected to the reading comprehension process (i.e., the establishment of causal/logical and referential relations) (Van den Broek & Kremer, 2000) so that the focus on language remains in service of constructing a coherent mental representation of the text (Kintsch, 1986; Van den Broek & Kremer, 2000). Knowledge of the functional grammar metalanguage and how it helps readers construct meaning enabled Ms. Youssef to be flexible and opportunistic with functional grammar analysis.

As one practice among other practices that complement and support a linguistic orientation to meaning-making, functional grammar analysis can be considered an instructional technique that is realized through specific discourse moves that help students identify the meanings that are central to small segments of text. Whole-class shared-readings of short text excerpts, iterative readings of text, patterned lines of inquiry, and clearly identified purposes for reading contextualize functional grammar analysis in scaffolded, dialogic, social opportunities for the purpose of co-constructing meaning.

Functional grammar analysis, informed by SFL, can be a response to the call for more linguistic approaches to reading comprehension instruction for English learners (Fillmore & Snow, 2000; Han & D'Angelo, 2009; Schleppegrell, 2006; Turkan et al., 2014). For English learners, functional grammar analysis—as it was realized in the Language and Meaning curriculum and Ms. Youssef's enactment—makes genre-specific text features in academic texts explicit (Schleppegrell, 2013). It directs English learners' attention to the key ideas in texts and

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raises their consciousness (Ellis & Larsen-Freeman, 2006) about the language authors use to present implicit meanings, including the author's attitudes and degrees of confidence about claims in informational science texts (Christie, 2012). Functional grammar analysis enables teachers to make explicit how meanings are encoded linguistically in text (Han & D'Angelo, 2009). Situated within text-based discussions (Kucan & Palincsar, 2013), functional grammar analysis provides opportunities for English learners to use language to negotiate meaning, use language to talk about language, and develop their oral language proficiency which is directly related to their reading comprehension (Geva, 2006); it promotes a language-rich environment constructed around the larger purpose of learning how to leverage metalinguistic knowledge when making meaning with text (Grabe, 2009). These findings lead to the following hypothesis: If all English learners in U.S. schools were given access to instructional contexts such as the one illustrated in this study, consistently and over a period of consecutive years, they would have the chance to learn academic language, read for meaningful purposes, and engage in discussions about grade-level texts. As a result, English learners would be included in the discourses of school (Schleppegrell, 2004) that would help improve both their academic language proficiency and reading comprehension.

Teacher Knowledge

Functional grammar analysis, as it was designed and incorporated into the Language and Meaning curriculum, was not just the use of metalanguage and not just a technique for bringing students' attention to the language in texts. Contextualized in a patterned line of inquiry, functional grammar analysis supported Ms. Youssef's ability to connect the text to students' thinking and meaning-making. As a result, functional grammar analysis served the overarching purpose of reading and supported the social and cognitive processes necessary for

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comprehension. For teachers to use metalanguage in service of meaning-making, they need to understand the linguistic features to which the metalanguage refers and how attention to those features can support readers in making form-meaning connections. To be able to use functional grammar analysis flexibly, teachers have to know what it does for students, what it gives them access to, and how the focus on particular features helps them hone in on key meanings in the text that should inform their reasoning.

Ms. Youssef's knowledge of functional grammar analysis, supported by the professional development and the curriculum, informed her instruction. She used her knowledge of functional grammar as an underpinning guide in discussions about the text's language and its meaning. It was initially implicit in the discussions, which enabled her students to focus on the meaning rather than the metalanguage. For this to happen, she had to have knowledge of the metalanguage, functional grammar, and the overall meaning-making purpose for reading a particular text. Adopting a linguistic orientation to meaning-making requires the teacher's investment in developing disciplinary linguistic knowledge (Fang & Schleppegrell, 2008; Turkan et al., 2014), knowledge of genre-specific forms and patterns (Duke et al., 2012), and knowledge of metalanguage that can be used to talk about text features with students.

Curriculum and Professional Development

In order for teachers to adopt a linguistic orientation to meaning-making, they need supports (e.g., curricula, professional development) that will help them 1) understand theories of language learning and reading comprehension, and 2) enact linguistically-informed, language arts curricula in service of content-area goals. By understanding the sociolinguistic, cognitive, and sociocultural theories of learning that underpin a linguistic orientation to meaning-making, teachers can begin to view language learning and reading comprehension as synergistic rather

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than distinct processes. Understanding the theoretical principles also enables teachers, as creators of context-sensitive pedagogies that meet the needs of their students, to be flexible and opportunistic in their use of functional grammar. With language as a meaning-making system, functional grammar analysis needs to remain meaning-focused. Otherwise, there is the risk that it will be adopted as an exercise in parsing grammar rather than a quest for content knowledge facilitated by a focus on how language means (Halliday, 1993) in texts.

This case study assumed that a written curriculum can support teachers' instruction if the development of the curriculum is iteratively informed by teachers' enactment and feedback (Ball & Cohen, 1996). The high degree of fidelity in Ms. Youssef's instruction suggests that curriculum can support the development of teachers' pedagogical content knowledge, disciplinary linguistic knowledge, and enactment of a linguistics-based approach to reading comprehension instruction. However, an out-of-the-box curriculum alone may not be sufficient support for teachers when they are learning how to adopt a linguistic orientation to the teaching of reading comprehension with both narrative and informational texts. A written curriculum will never be able to anticipate all of the issues that will arise in enactment across contexts. Even along with the professional development institutes, the written curriculum was not always sufficiently supportive of Ms. Youssef's content knowledge and disciplinary linguistic knowledge. This was particularly evident in her enactment of Unit 4 when the stages of the argument, the metalanguage of usuality and likelihood, and the selection of evidence in the text became quite challenging. Granted, the curriculum was under development, but even so, if Ms. Youssef had been supported in additional ways (e.g., ongoing conversations with research team members), some of the challenges may have been addressed during enactment.

For those involved in designing curriculum to support teachers' employment of a linguistic orientation to meaning-making, the findings from this case study illustrate how a written curriculum is not only a guide for teaching but also a resource for teachers' learning and professional development. As a resource for teacher-learning and to encourage teachers' flexible use of an instructional technique such as functional grammar analysis, a curriculum designed to support a linguistic orientation to meaning-making needs to include:

1) explanations of the theories underpinning the design of the curriculum and specific examples of practices that illustrate both alignment and a lack of alignment with the theory in service of meaning-making goals,

2) texts that warrant the application of metalinguistic tools in service of constructing meaning (e.g., narrative fiction texts with implied meanings or informational texts with linguistically complex sentences),

3) clear definitions of all metalinguistic terms,

4) illustrative examples of how each metalinguistic term can be used implicitly and/or explicitly—once the terms have been defined—in text-based discussions aimed at constructing meaning, and

5) ongoing, online support for teachers as their knowledge evolves through the teaching of the curriculum and challenges arise.

With an ongoing, online support site, teachers can participate in online discussion forums, exchange ideas across contexts, and receive guidance from curriculum developers in real time. To anticipate areas of challenge, curriculum developers can study teachers' enactment of curriculum and use these data to inform and revise the development of new materials.

Significance of This Study

For teachers and researchers interested in how we can promote the advancement of English learners' literacy development in the elementary grades, this study makes explicit how a linguistic orientation to meaning-making can be translated into a literacy and language pedagogy. By specifying instructional practices that created and supported opportunities for English learners' to engage in meaningful ways with narrative and informational texts, this study can be a resource to which teachers can turn to better understand how to use functional grammar analysis as a tool for facilitating linguistically oriented, text-based discussions. Functional grammar analysis provides a metalanguage with which teachers can facilitate discussions about key ideas that are central to the meanings in text. Through iterative readings of select text excerpts and visual representations of students' emergent understandings, teachers can scaffold the analysis of word meanings and clauses to help students build causal relations with narrative texts and logical/referential relations with informational science texts. For researchers interested in how such an approach can support English learners' reading comprehension and language development simultaneously, aspects of the pedagogy described here can be instantiated and studied further, such as the role of implicit versus explicit metalanguage, the potential of role-play, and the role of oral language in the meaning-making process. These areas for future research will be discussed below.

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Limitations

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As empirical research, specifically a situated case study of one teacher's enactment of a curriculum, it is important to acknowledge this study's limitations of which there are two: limited data collection and the study of a single teacher.

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Incomplete Video Data From Units 1 and 2

During data collection for Units 1 and 2, I had not yet chosen Ms. Youssef to be the focal teacher for this case study. The research team was still in the process of surveying many teachers in the project. Our resources were limited, and we were trying to observe as many different teachers as possible. Once we determined our focal teachers, one of which was Ms. Youssef, we decided to devote our efforts to capturing complete data sets of Units 3 and 4. We provided a monetary incentive for teachers who agreed to implement and record every lesson. Unfortunately, Units 1 and 2 were not captured in their entirety. As a result, I was not able to analyze each lesson or see how Ms. Youssef introduced key functional grammar concepts, such as the attitude line.

Study of a Single Teacher

Despite the strengths Ms. Youssef possessed that made her enactment of the Language and Meaning curriculum an ideal case study, this study remains the study of a single teacher. Ms. Youssef's enacted curriculum is not like other teachers' enacted curriculum. The variance in teachers' enactment of a curriculum makes the study of a single case idiosyncratic. The professional development that accompanied the written curriculum provided a venue for making teachers' innovations and modifications with the curriculum public. It gave the research team a way to demonstrate and encourage rich enactment and extensions of the written curriculum that were occurring as a result of teachers bringing their pedagogical expertise and knowledge of their students into their instruction. In addition to teachers' feedback on the reflection logs, teachers' enactment was informative for the research team and the iterative design of the curriculum. This study of a single teacher does not present sources for comparison (e.g., other teachers' enactment of the same curriculum). The knowledge generated by the study of a single

teacher must be acknowledged as highly contextualized. To further explore the theory of a linguistic orientation to meaning-making and teachers' instantiations of a practice informed by this theory, future research is needed.

Future Research

To further explore the validity and viability of a linguistic orientation to meaning-making as an instructional approach that can advance English learners' reading achievement, I propose three areas of inquiry: the role of metalanguage, the potential of role-play, and the role of oral language. The first area of inquiry explores the role of metalanguage. Throughout Ms. Youssef's enactment of the Language and Meaning curriculum, she used implicit and explicit metalanguage to facilitate students' meaning-making with texts. However, the students rarely used the metalanguage themselves unless prompted by Ms. Youssef or in Unit 4 when they were noticing the *connectors* in the text. Should metalanguage be a teacher's linguistic tool or should the goal be for students to *acquire* and *use* the metalanguage to talk about texts as well? How, if at all, does students' explicit use of metalanguage contribute to their reading comprehension? How does a teacher's *explicit* use of metalanguage, versus *implicit* use of metalanguage, contribute to students' reading comprehension?

The second area of inquiry explores the potential of role-play in English learners' analysis of characters in narrative texts. In Unit 2, Ms. Youssef used the attitude line to help a student articulate his interpretation of Sara's feelings when her old friend, Kylie, hugged her. Sara's arms were "pinned to her side" as she "braced herself against the force of Kylie's hug." Despite the negative connotation in the description of Sara's body language in the text, the student did not interpret Sara's attitudes as negative. In the role-play of this text excerpt, this same student played Sara and still did not understand Sara's feelings at that point in the story.

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How might teachers use role-play to support English learners' understanding of the language in text, in particular, indirect characterization communicated through doing processes? How does enacting a role-play versus watching a role-play support students' interpretations of characters' attitudes?

The third area of inquiry explores the role of oral language. In the present study, Ms. Youssef's students struggled to connect the understandings constructed during the hands-on experience of building a simple circuit with the scientific phenomena as explained in the text. In her work with English learners learning science, Gibbons (2004) has shown how teachers can scaffold English learners' acquisition of academic, discipline-specific oral language through teacher-student discourse. To build on Gibbons' work and address one of the challenges encountered in the present study, future research can explore how teachers' and students' use of oral language scaffolds students' connections between hands-on experiences in science and their understanding of the concepts in the text. What instructional practices support English learners in using oral language to make connections between scientific concepts witnessed during hands-on experiences/experiments and their understanding of concepts as they are explained in informational science texts?

Conclusion

Across these four units of instruction that spanned the length of a school year, meaning-making with text was a co-constructed phenomenon. Ms. Youssef provided high degrees of scaffolding as she led her class of 21 students, all of whom are English learners, through the processes of character analysis and the building of conceptual knowledge with text. This dissertation did not foreground the specific, individual meanings the students ultimately constructed as a result of having participated in these lessons. Instead, this study presented a

"telling case" (Mitchell, 1984) of how one fourth-grade teacher, Ms. Youssef, enacted a curriculum that featured close attention to language and meaning with both narrative fiction and informational science texts. By studying ways she created opportunities for meaning-making and practices she used to create these opportunities, I have illustrated how functional grammar analysis provided a way for a teacher and her students to talk about the language in the text, the meanings of the text, and the ways authors use language to depict characters and communicate scientific concepts and issues. By identifying challenges Ms. Youssef and her students encountered along the way, I have acknowledged some of the complexities inherent in supporting metalinguistic awareness and the learning of content simultaneously. Despite the challenges, functional grammar analysis remains an integral part of Ms. Youssef's instruction:

> I take so much pride in internalizing functional grammar because when I receive a compliment by an observer in my classroom, I smile and in my heart I say, 'Thank you to you all,' and this is not just talking. This is reality. Professor Schleppegrell—and all of you later—since the old days, since day one when she came to our school years ago, and made me look at text in a different way. Those lessons helped me invest. So functional grammar, in my opinion, is a winning card for me. It's a life investment in me. It is my winning card. When someone says, 'Oh go attend one of Ms. Youssef's lessons during reading,' I always say, 'But it's not going to be Daily Five in any subject.' I pull out functional grammar and that's my winning card. (Ms. Youssef, personal communication, July 14, 2014)

> For a researcher like me, Ms. Youssef and the opportunity to study her instruction was "a winning card."

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APPENDICES

APPENDIX A - CURRICULUM
Grade 4 Unit 1 Outline of Lesson Plans

Lesson 1: Read the story; address any vocab or fill in gaps of prior knowledge based on your kids.

Lesson 2: Introducing *Characteristics*. Students will gain awareness about how authors present characters' traits through their actions, dialogue and attitudes. Students will learn to evaluate characters based on these traits.

Lesson 3: In this lesson students will learn to pay close attention to what characters do and say to learn about their personalities. They will learn about direct and indirect characterization by looking at the various ways in which an author can communicate a character's personality to the reader.

Lesson 4: Introduce the focus on *attitudes* and identify attitudes as positive/negative; introduce the "attitude line." Students will look at examples that are "turned up". Focus on the words that communicate the attitudes – the actions or dialogue that show characters' attitudes.

Lesson 5: In this lesson, students will the attitude line and learning about TURNING DOWN attitudes.

Lesson 6: Introduce the idea of "meaningful chunks" of language. This is important because attitudes are not always contained in one word, but rather in chunks of words that work together. Specifically, this lesson introduces PROCESSES.

Lesson 7: In this lesson, students will learn about the four process types and practice identifying whether or not they communicate attitude in a story.

Lesson 8: Use doing processes to make inferences about character attitudes. By looking at how actions can communicate attitude, students will understand the distinction between show and tell in regard to characterization/presentation of attitudes.

Lesson 9: In this lesson, students will learn to identify dialogue in a story, label the functional parts of the dialogue, and determine whether or not those language chunks have attitude that can teach us about the characters.

Lesson 10: This lesson summarizes the unit by reviewing the three key questions about characterization and having the students practice with an unfamiliar excerpt from the story.

Unit 1: Three-column Organizer Key

*This is the **conversation guide** for the unit. All of the examples from Tomás and the Library Lady are included here. You can use these to guide your discussion during lessons. Answers may vary. These are only suggested interpretations of the text. You can also select other parts of the text to talk about Tomás and how he becomes a storyteller in his family.*

Character name: Tomás

Words from story: Character actions, dialogue, attitudes	*Does it show feeling or opinion? What emotion?*	*What does it show about what kind of person he is?*
Example (pg. 162) Early the next morning Mamá and Papá went out to pick corn in the green fields. All day they worked in the hot sun. Tomás and Enrique **carried water to them**.	Does not show emotion but still tells us about Tomás	He is a caring person because he brings water to his thirsty family members.
Example (pg. 161) "Mamá," **whispered** Tomás, "if I had a glass of cold water, I **would drink it in large gulps. I would suck the ice. I would pour the last drops of water on my face**."	Tomás is very hot and thirsty. He is uncomfortable after the long hot car trip.	Maybe he is patient because he whispers instead of demanding water OR he is whispering because he is sleepy and does not have energy to be loud.
Example (pg. 161) Tomás <u>was tired too (-)</u>. <u>Hot and tired</u> (-/↑). He <u>missed his own bed</u> (-/↑), in his own house in Texas (↑).	Tomás is sad; lonely	Tomás is not in a good mood here. He's pretty uncomfortable and not in the mood to travel. He misses home.
L3 Activity (pg. 162) Tomás **helped** his grandfather, Papá Grande,	Tomás is being helpful	He is nice. He cares about his grandfather.

Words from story: *Character actions, dialogue, attitudes*	Does it show feeling or opinion? What emotion?	What does it show about what kind of person he is?
climb down.		
Example (pg. 165) The next morning Tomás walked downtown. He looked at the big library. Its tall windows were like <u>eyes glaring</u> (-/↑) at him. Tomás walked <u>around and around</u> (-/↑) the <u>big</u> building. He saw children coming out carrying books. <u>Slowly</u> he started <u>climbing up, up</u> (-/↑) the steps. He counted them to himself in Spanish. Uno, dos, tres, cuatro… <u>His mouth felt full of cotton</u>. (-)	He is hesitant; afraid; cautious	The library is *personified* here as someone scary with "eyes glaring." And he circled the building many times because he was so scared to go in. Maybe working off some nervous energy. The description of the steps emphasizes how big the library is… and why it's so intimidating to Tomás. His mouth feeling like cotton shows he's really nervous…
Example (pg. 168) Tomás saw dinosaurs bending their long necks to lap shiny water. He heard the cries of a wild snakebird. He felt the warm neck of the dinosaur as he held on tight for a ride. Tomás forgot about the library lady. He forgot about Iowa and Texas.	No real emotion here, but we learn about Tomás' imagination	Although Tomás' actions seem neutral, we can read between the lines to learn that Tomás is captivated by the dinosaurs in his book. He is able to get lost in his imagination and forget about the long hot trip to Iowa and the hard work that his family is doing.
Example (pg. 168) Tomás walked out of the library carrying his books. He <u>ran home</u> (+/↑), eager (+/↑) to show the new stories to his family.	He is eager; excited; happy; inspired to be a storyteller like papa grande	Tomás is so excited about the books that he doesn't walk home … he runs! He can't wait to show them.

Words from story: Character actions, dialogue, attitudes	Does it show feeling or opinion? What emotion?	What does it show about what kind of person he is?
The library lady said, "Buenas tardes, señor." <u>Tomás smiled.</u> (+) He had <u>taught the library lady</u> (+) how to say "Good afternoon, sir" in Spanish.	Tomás is bilingual He likes teaching the librarian He is happy	Tomás is proud that he was able to teach the library lady some Spanish. It makes him happy.
Example (pg. 174) That night, <u>bumping along again in the tired old car</u> (-/↑), Tomás held <u>a shiny new book</u>, (+/↑) a present from the library lady. Papá Grande smiled and said, "More stories for the new storyteller<u>.</u>"	Tomás is feeling good about this trip, he is happy; content; positively distracted by the book	The drive home is still slow, similar to the drive to Iowa. But now Tomás has something good to take his mind off of the ride: a shiny new book.
Example (pg. 173) **Softly** Tomás **said**, "I have a sad word to teach you today. The word is *adiós*. It means good-bye."	Bilingual Sad	Tomás will miss the library lady. They became friends
Example (pg. 173) The library lady said, "How nice. How very nice. *Gracias*, Tomás. Thank you." She gave Tomás a big hug.	This is an example of how we can learn about Tomás through someone else's speech.	Based on her words, we can see that Tomás is friendly and generous because she thanks him for bringing a gift.

Unit 2: Character Analysis Graphic Organizer

DIGGING INTO CHARACTER ANALYSIS

Prompt: Is Sara a good friend? Why or why not? Provide evidence to support your ideas.

Claim: Statement evaluating character + reasons. (Your short answer to the prompt + reason)

Hint: You'll probably use a *being process* + *"because"*

Orientation to evidence: Background information: What is happening in the story before your evidence?	**Evidence:** Words from the story that support your claim. (What proves that she is a good or bad friend?)
Hint: You'll might tell when and where + use *doing processes* to tell what was going on.	**Hint:** Remember to put quotation marks around language from the story.

Interpretation: TELL any attitudes that are SHOWN. (If it **shows** something about Sara's feelings, **tell** your reader what they are and how you know.)

Hint: Use being or sensing processes!

Evaluation: Explain why the evidence proves your claim: (Why does this evidence prove she is a good boy or bad friend?)

Hint: "This shows ... because ... "

Grade 4 Unit 2 Outline of Lesson Plans

Lesson 1:   Students will read the story *Best Friends* and engage their personal background knowledge about their friendships with other children in order to respond to a personal response prompt.

Lesson 2:   Students will review process types and show/tell by looking for these features in the Best Friends text. Students will practice interpreting shown attitudes by turning doing/saying into being/sensing. Students will also become familiar with the graphic organizers that will be used throughout this unit to collect evidence for writing their character analysis. The teacher will have 2 GOs up in front of the class (Kylie and Sara), but the students will only be working with the one about Sara because that is ultimately the only prompt that they will be writing to.

Lesson 3:   Students will interpret the second half of the Best Friends story while thinking about their answer to the prompts. They will find attitudes in the text, act out a segment of the story, and continue building the graphic organizer about Sara's character traits.

Lesson 4:   Students will write interpretations of Sara's character, building on the conversation from Lesson 3. They will also engage in a partner discussion about whether Sara is a good friend or not. This is an oral rehearsal of some of the debates/points that will be central to the character analysis writing. Students will continue to build the graphic organizer for Sara.

Lesson 5:   Students will become familiar with the character analysis genre through direct instruction and a scramble activity. They will learn to identify stages of character analysis, choose which evidence best supports their claim, and learn what it means to make an evaluation.

Lesson 6/7:   Students will both, co-construct response to the prompt and start writing a response independently using a writing scaffold. In order to support their writing, students will give/get feedback at each stage to encourage cohesion from their claim to their evaluation.

Lesson 8:   Students transfer writing from their graphic organizer onto paper in paragraph form to "publish" their character analysis. A few students will share sections that highlight certain aspects of what we worked on: claim, turning up or down, evidence matching claim.

Best Friends

Sara and Kylie were best friends. At school, they ate lunch together and played together during recess every day. They had play dates every Saturday afternoon. But during the summer, Kylie's family went to Maine, and Sara's family stayed in Michigan.

For the first couple of weeks apart, they would send emails to one another. They both wished summer would end quickly. But the emailing eventually stopped. Kylie started enjoying her time at the beach, and Sara forgot to write emails because she spent hours reading and drawing in her tree house.

One afternoon in July, as Sara was climbing into her tree house, she saw a little girl in the yard of the house next door. Sara thought no one lived there. The house had been empty for quite some time. Sara stood there on the ladder, staring at the girl who was sitting on the lawn picking at the grass.

"Hi," Sara called to the little girl. The girl looked up.

"Hi!"

"You want to come play in my tree house?" Sara asked.

"Sure," the girl said. "Let me go ask my dad!"

A moment later, the little girl from next door came bounding through the gate. "I'm Meg! What's your name?"

"Sara. Do you like to draw?"

"Yeah!" So Meg followed Sara into the tree house to draw.

From that moment on, Sara and Meg spent every day together that summer. They ate lunch together. They drew together. They even read books to one another as they drank lemonade and ate cookies in Sara's tree house.

On the first day of the new school year, Sara and Meg walked to school together, laughing and talking the whole way there. Once they got to the edge of the playground, Kylie spotted them. "Sara!" she cheered as she came running with arms outstretched. Kylie wrapped her arms around Sara. Sara stood there with her arms pinned to her side as she closed her eyes and braced herself against the force of Kylie's hug. "I missed you so much!" Kylie exclaimed.

"This is Meg," Sara said once Kylie let go of her.

"Hi!" Meg said smiling. "I'm new here! I'm going to be in your class."

"Oh, well, good," Kylie shrugged. "Come on, Sara. Let's go swing." Kylie reached for Sara's hand and tugged at her arm, but Sara didn't move.

"Meg and I were going to draw on the blacktop with my new chalk," Sara said.

Kylie's smile faded. She looked at Sara and then at Meg. Sara bowed her head.

"You wanna come draw with us?" Meg asked.

"Sure, I guess," Kylie replied.

Sara glanced at Meg and smiled. Meg smiled back. And the three girls walked to the playground, together.

Unit 2: Three-column Organizer Key for Sara

Words from story: *Character actions, dialogue, attitudes*	*Does it show attitude? If so, what emotion?*	*What does it show about what kind of person she is? (Is she a good friend or not?)*
"You want to come play in my tree house?" Sara asked.	(No attitude)	Sara is a nice person because she is reaching out to a new friend who just moved to the neighborhood.
Sara **stood there** with her arms pinned to her side as she **closed her eyes** and **braced herself** against the force of Kylie's hug.	Overwhelmed, annoyed, conflicted, not having the same feelings as Kylie	Sara is better friends with Meg now because they spent the summer together and is having a hard time sharing Kylie's reaction. OR she doesn't want Meg to feel left out so she waits to reconnect with Kylie until she has had a chance to introduce them.
Kylie reached for Sara's hand and tugged at her arm, but Sara **didn't move**.	Resistant, not wanting to do what Kylie wants, loyal to Meg, torn between the two friends	Sara is being loyal to Meg because they have already decided to go draw. OR Sara wants both Meg and Kylie to be friends before they start to play together.
Sara **bowed her head**.	Guilty, confused, betrayal (for hurting Kylie's feelings), apologetic	Sara feels bad for hurting Kylie's feelings OR she is confused about which friend to side with in this situation.
Sara glanced at Meg and **smiled**. Meg smiled back. And the three girls walked to the playground.	Happy, less confused, satisfied	Sara is glad that she and Meg will get to go draw together. OR she is happy that Kylie decided to join them instead of going to the swings.

Unit 3

Grade 4 Unit 3 Outline of Lesson Plans

Lesson 1:   Students will complete 2 pre-assessment tasks (multiple choice and independent writing) and begin to engage with the electricity text. They will also review participants and author's attitude. (PG. 2)

Lesson 2:   Students will focus on the section of the text that discusses atoms. Using FG features of participants and processes, students will make sense of the text and draw an image to support their comprehension. (PG. 6)

Lesson 3:   Students will focus on the section of the text that discusses batteries. Using FG features of participants and processes, students will make sense of the text and draw an image to support their comprehension. (PG. 12)

Lesson 4:   Students will finish reading the electricity text and review the important information that they've learned by summarizing sections of the text. (PG. 16)

Lesson 5:   Students will focus on the section of the text that discusses batteries and circuits. Using FG features of participants and processes, students will make sense of the text and build a simple circuit to demonstrate what is being described in the text. (PG. 18)

Lesson 6:   Students will learn how the FG feature of connectors works in this text and review the important people in the story of electricity. They will finish the unit by completing two post-assessment tasks (multiple choice and independent writing). (PG. 21)

Electricity: What is it and who invented it?

You flip a switch and a room that was in total darkness becomes bright as day. You press a button and a machine that was completely still whirrs into action. Every day we experience the wonder of electricity and give it very little thought. But the story of how electricity was invented is a very interesting story; one that is filled with clever thinking, good fortune, and even cheating!

Electricity was first discovered about 2,500 years ago. Amber is the hard fossilized sap from trees. The Greek scientist Thales of Miletus noticed that if a piece of amber was rubbed with a cloth it attracted straw or feathers. Interestingly, the word "electricity" comes from the Greek word for amber – "electron." Today, we would call what Thales noticed, "static electricity."

You have probably experienced static electricity when you took off a wool hat and your hair stood up! Or, perhaps you walked across a carpeted room and, when you touched a doorknob, you experienced a sudden "zap"! To understand this phenomenon, we need to learn what stuff is made of.

Imagine a pure silver coin. Imagine that you could divide that coin into smaller and smaller parts. Soon you would have a piece of silver coin that is so small that you would not be able to see it without a microscope. It may be very, very small, but it is still a piece of silver. If you could keep dividing it into smaller and smaller pieces, you would finally get to the smallest piece of silver possible. It is called an **atom** of silver. If you divided this atom into smaller pieces, it would no longer be silver.

Electrons in the Atom

What are atoms made of? In the middle of each atom is a "**nucleus**." The nucleus contains two kinds of tiny particles, called **protons** and **neutrons**. Circling around the nucleus are even smaller particles called **electrons** (and now you know that this is a Greek word).

Protons, neutrons and electrons are very different from each other. Each has its own properties, or characteristics. One of these properties is called an electrical charge. Protons have what we call a "positive" (+) charge. Electrons have a "negative" (-) charge. Neutrons have no charge. They are neutral. The protons and neutrons in the nucleus are held together very tightly. But the electrons in some materials are not held tightly; in fact, they can move pretty freely. When a material has electrons that are able to move very freely, it conducts electricity. We call it a conductor. Most metals are good conductors. When a material holds its electrons tightly and the electrons do not move, it does not conduct electricity. We call it an **insulator**. Plastic, cloth, and glass are insulators.

How can we move electrons from one place to another? One very common way is to rub two objects together. If they are made of different materials, like the amber and cloth that Thales investigated, electrons may move from one material to the other. The more rubbing, the more electrons move, and the larger the static charge that builds up. Scientists believe that it is not the rubbing or friction that causes electrons to move; it is simply the contact between two different materials and rubbing just increases the contact area between them.

Inventing the Battery

Count Alessandro Volta, who lived in Italy, invented the first battery in the 18th century. He called it a "voltaic pile." It consisted of a pile of metal discs separated by pads in an acid

solution. The acid allowed the electrons in the metals to travel even more freely, creating an **electric current**. An electric current is the flow of electricity through a conductor.

Today, we call a "voltaic pile" a **battery**, but we still honor Count Volta because we call the unit for measuring electricity, a **volt**. For example, an AA battery (the kind that we use in flashlights) produces 1.5 volts of electric current.

The electric current provides **energy** that makes things run. The electrons flow through wires that are made of metal (conductors) and covered in plastic (an insulator). The wires lead into things like motors or light bulbs (**resisters**), where the electric current carries **energy** that does **work**. The energy of the electrons is converted to heat or light as the electrons make resisters run. The electricity forms a **circuit** as the electrons push their way through the resister and more wires carry it back to the battery.

Inventing the Light Bulb

An important way we use electricity today is to light our homes and communities. Many people think Thomas Edison invented the light bulb. But, in fact, a Canadian scientist named Henry Woodward was the first to develop the light bulb. Unfortunately, he did not have the money to make light bulbs after inventing them. He sold his idea to Thomas Edison, who was the first to figure out how to make large numbers of light bulbs available to the public. He made the light bulb practical and that is why we associate his name with light bulbs.

Making Electric Current Practical

Thanks to the work of Thomas Edison, it became possible to light whole houses and even the streets of cities. The system that Edison designed for making electric current available, however, required a large power station about every mile and very thick cables. Along came Nikola Tesla, who claimed that he had a better design that would enable electricity to travel much further. Edison hired Tesla and Tesla claimed he was offered $50,000 (~ US$1.3 million in 2011) if he redesigned Edison's electric generators. Tesla was successful, but (and here is where cheating comes into our story) when Tesla asked Edison about the payment for his work, Edison replied, "Tesla, you don't understand our American humor," thus breaking his word.

Tesla went to work for George Westinghouse, who formed the greatest electrical manufacturing company in the country, using Tesla's technology. Westinghouse became a very rich and famous man. But Tesla decided he would rather work alone. He left Westinghouse's company and, while he went on to make many more important inventions, he died a very poor man, who is often forgotten in the remarkable story of electricity.

Unit 4

Grade 4 Unit 4 Outline of Lesson Plans

In Unit #3, the students learned how to use functional grammar to read informational texts carefully. In Unit #4, we continue to practice interpreting and learning from informational texts, but we also learn how to use content knowledge and word choices to write an argument in which we make a claim, provide evidence for the claim, and anticipate what someone else might say about our claim and evidence.

Lesson 1: In the first lesson, students will read a short text about a type of South American toad called a Cane Toad. The Cane Toad was brought into Australia in an attempt to control a beetle that was eating the farmers' sugar cane crop. But as an invasive species, the toad has begun to disrupt the balance of the ecosystem. You will read the text aloud and guide the students' comprehension while they each have their own copy of the text. You will note new science vocabulary and generate a chart as the terms are encountered and discussed.
(Science Note: All toads are frogs, but not all frogs are toads.)

Lesson 2: In preparation for writing an argument about what scientists should do to manage the cane toad invasion, students will review the concept of ecosystems and how the cane toads have disrupted a specific part of Australia's ecosystem. Together, you will read and discuss one solution scientists are considering: Meat Ants!

Lesson 3: This lesson introduces the Argument text type and some of its common stages (that is, the parts of an argument and how the parts are organized). As students are introduced to the stages, they will engage with a model response, identifying some of those stages. They will also consider what makes an argument particularly effective, such as anticipating what someone who does not agree with your argument might argue.

Lesson 4: Although science is often talked about as if it is completely objective, in fact, scientists often indicate, by the language they use, that their conclusions or predictions are not certain. This lesson will introduce students to the concept of **likelihood**—how authors use language to show how **usual** or **likely** it is that something will happen. Students will pay attention to this language as they collect and evaluate evidence regarding the meat ants.

Lesson 5: In this lesson, students will review the stages of an argument and focus on connecting evidence and reasons to support their claim.

Lesson 6: In this lesson, students will anticipate what facts someone might use to disagree with their claim and determine how much they agree or disagree with those facts and why. Instruction will focus on the counterargument stage of argument writing.

Lesson 7: In this lesson, your student will write a Description of the Issue stage. You may decide to construct this with them. And then students will compile all previous work they've done on their graphic organizers into paragraph form on notebook paper. If you have time, some students can read their final pieces aloud to the class.

The Cane Toad Invasion

In the 1930s, farmers in northern Australia had a big problem: beetles were eating the sugar cane crop. Sugar cane is a plant that sugar is made from. It is an important **crop** for Australia. To stop beetles from destroying the sugar cane, scientists brought the South American cane toad to Australia. They thought the toads would eat the beetles. But the plan didn't work.

Instead, the cane toads turned into an even bigger problem. This **invasive species** didn't eat many beetles, but they ate lots of other things, like bird eggs and smaller frogs. The huge toads also laid lots and lots of eggs in ponds and creeks near the cane fields. Female toads can lay 35,000 eggs at a time! The toads left the cane fields, and soon, they were all over northern Australia. They became serious **predators** of several kinds of Australian insects. Each toad can eat about two and a half times its body weight in one day—that's a lot of food! Even worse, nothing could stop them because cane toads are very **poisonous** when eaten. Predators like lizards, snakes, crocodiles, and even household pets began to die because they were poisoned when they tried to eat the toads. Scientists have found that many animals are **at risk** because they don't know that eating the toads will kill them. In one study, about 90% of the big lizards in one area had died because they tried

eating the toads. A scientist studying the problem said, "There are all sorts of **effects**. You take out 90% of the big predators and that really changes the system."

The Australian government has tried to get rid of the cane toads in many ways. So far, though, they have not been able to come up with a good **solution**. Some **potential** solutions can't keep up with the number of new toads that are born each year. Other solutions would put **native** toads and frogs in danger. Scientists are still hard at work trying to come up with a way to stop the cane toad invasion.
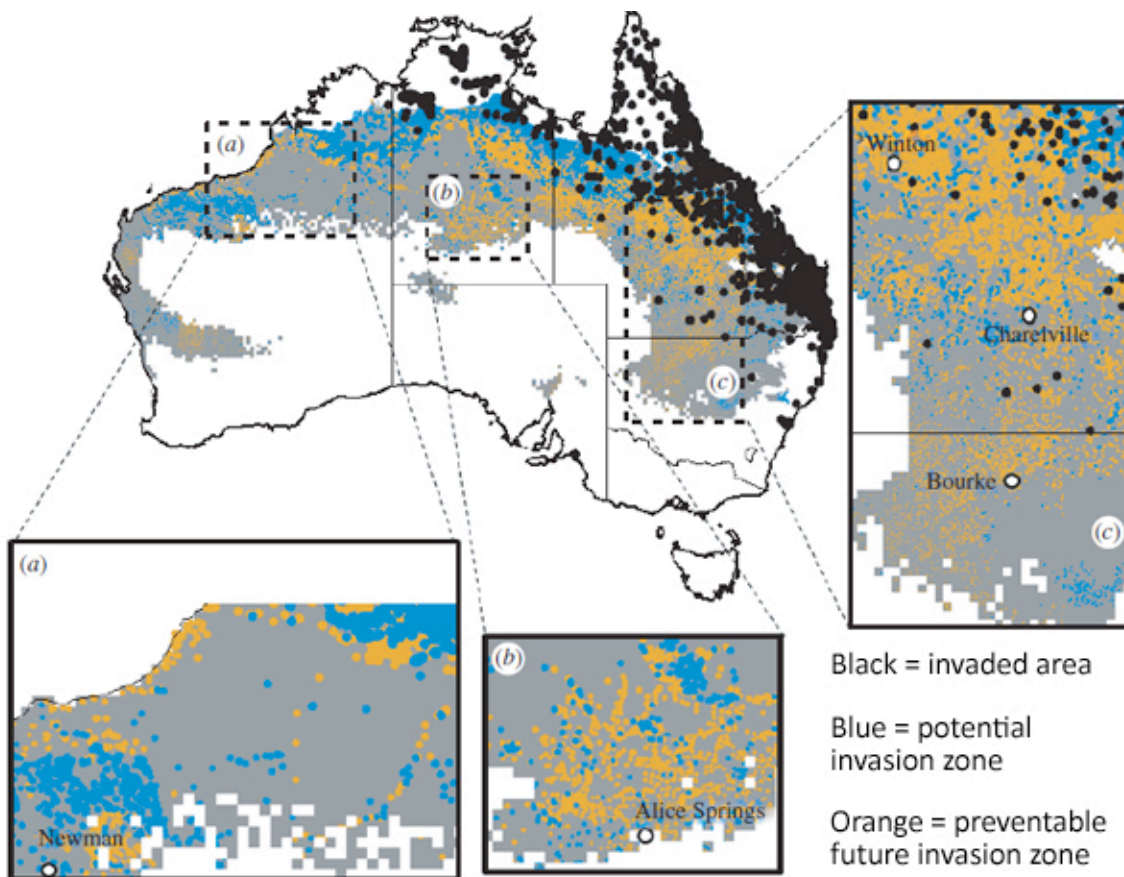

Figure 1. *If cane toads are left alone, scientists predict that they will invade even more land in northern Australia. In the 1930s, just 102 toads were brought to Australia. By 2011, the number of cane toads in the country was estimated to be as many as 2,000,000,000 (two billion)!*

Possible solution: Meat Ants

Meat ants, also known as gravel ants, can be found everywhere in Australia. You can find them in sunny, moist areas living in underground nests of over 64,000 ants. Even though they're called meat ants, they mostly eat honeydew from certain caterpillars and butterflies. In return, the ants protect the caterpillars from **predators**. So why are they called "meat" ants?

They are named "meat" ants because farmers have used them to clean the bodies of dead animals. In fact, they can even kill some live animals.

For example, meat ants are able to kill live cane toads. When a cane toad is attacked, it usually sits still and lets the **poison** in their skin kill the attacker, but it seems the cane toad's toxins do not hurt the meat ants because the ants are able to kill the toad while it just sits there.

In experiments, scientists used cat food to attract more meat ants to the ponds where cane toads breed. Almost no other species of toad live in these areas. Most of the time, attacks by the ants killed the cane toads immediately. If toads escaped half eaten, most of them died within 24 hours.
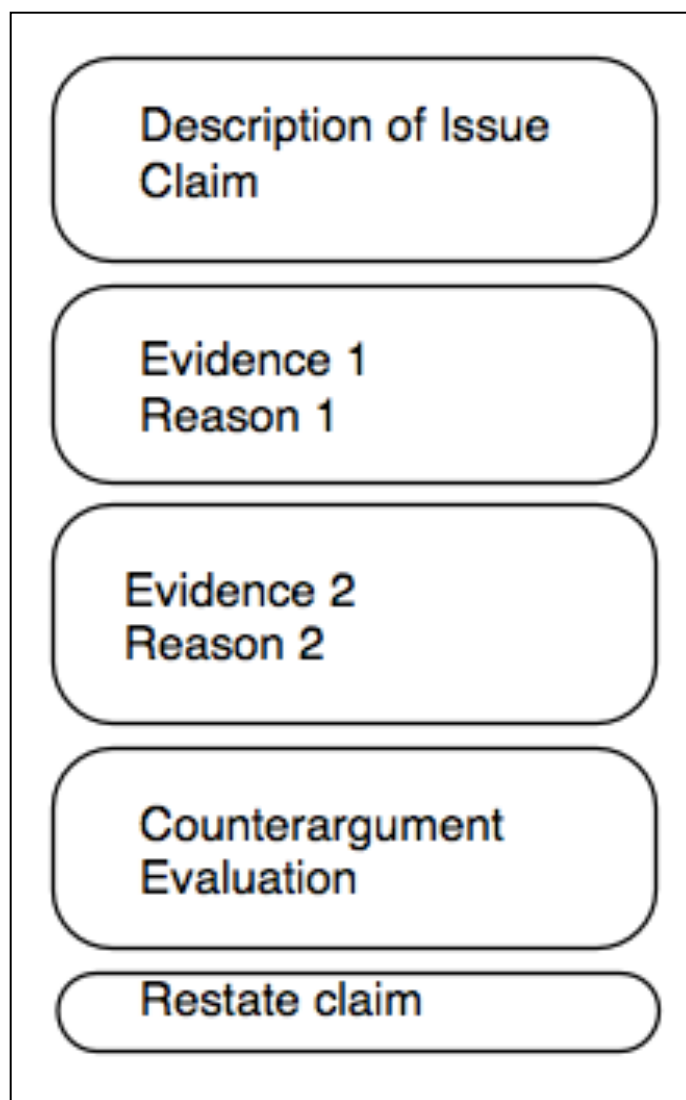
Meat ants don't often kill **native** toads. Meat ants eat during the day, and many native toads come out at night instead of the day. Plus, native toads know to hop away from the meat ants.

In these experiments, damage to other living things appears to be low, but scientists don't know for sure. Getting the ants to move to cane toads' ponds will likely lower the number of ants in other places. This could change the **behavior** of other living things in the **ecosystem**.

Meat ants did not stop cane toads from spreading across Australia, but meat ants have killed many toads. Bringing more meat ants to where cane toads breed could slow the spread of this **invasive species**.

Unit 4: Argument Graphic Organizer

Description of Issue
Claim

Evidence 1
Reason 1

Evidence 2
Reason 2

Counterargument
Evaluation

Restate claim

Unit 4: Evidence/Reason Graphic Organizer

Name: _____

Circle your claim (your position on the issue) so far:

Good, act now!   **Good, study more**   **Bad, don't use**

Evidence: A piece of information from the text that supports your claim.

Reason: How or why does this evidence support your claim? How and why does the evidence help or hurt the cane toad problem?

Evidence: A piece of information from the text that supports your claim.

Reason: How or why does this evidence support your claim? How and why does the evidence help or hurt the cane toad problem?

APPENDIX B - CODEBOOK

General	
CODE	**Definition/ Example**
MM (Meaning-making without functional grammar)	Discourse about the text's content or concepts. S: "I predict that the cane toads got sick of eating the beetles and they started to eat other species."
FG (Explicit attention to language using functional grammar)	Using implicit or explicit functional grammar metalanguage to bring explicit attention to linguistics features in the text. T: "What's the process in this sentence?"
MM +FG (Meaning-making with Functional Grammar)	Using implicit or explicit functional grammar metalanguage to bring explicit attention to linguistics features in the text during discourse about the text's content or concepts. T: "What is going on here?" S1: "He is climbing up and up." S2: "He saw kids coming out carrying books." T: "OK, tell me about how Tomas is feeling and can you prove it to me?"
LANG/VOCAB/GENRE (Explicit attention to vocabulary, language or genre without functional grammar)	Elicitations or explicit instruction focused on vocabulary or purpose/features of the genre. T: "I would like someone to remind me. What does indifferent mean?"
ARGU (Explicit use of argumentation metalanguage)	Discourse about the stages (structure and organization) or features of an argument. T: "Where is the word that shows there is an opinion? What did the author choose to write?" S: "I don't think."
Argument Metalanguage	
CODE	**Definition/Example**
EVIDENCE (Evidence in an argument)	Discourse about the definition and purpose of evidence and examples of evidence. T: "What's en evidence?" S: "You have to show the proof."
CLAIM (Claim in an argument)	Discourse about the definition and purpose of a claim and examples of claims. T: "Claim. What's a claim?" S: "When you take a stand."

REASON (Reason in an argument)	Discourse about the definition and purpose of a reason, its relationship to the claim and examples of reasons. T: "You are going to look at your evidence and look what you chose and think about the because. Explain why."
Functional Grammar Metalanguage	
CODE	**Definition/Example**
PART (Participant)	Implicit or explicit use of the metalanguage of participants to talk about who or what in a clause. T: "OK, now let's look at the first sentence and I want you to think carefully and tell me, who is the participant in the first sentence? Who are the participants?"
PROC (Process)	Implicit or explicit use of the metalanguage of processes to talk about what is happening or going on in a clause. T: "And what are they doing, what's the process here? What are the electrons—"
ATT (Attitude)	Implicit or explicit use of the metalanguage of attitude to talk about a character's or author's feelings or thinking. T: "Come, where would you place it on the attitude line?"
CONN (Connectors)	Implicit or explicit use of the metalanguage of connectors to talk about how or why authors use connecting words (e.g., but, and, if, in fact). T: "We have to explain what is the purpose of having that connector. 'But the plan didn't work.' What is the author doing to me?"
AUTHOR (Author's purpose, attitude or craft)	Discourse about how or why an author chooses particular words or makes particular moves. T: "Why is the author saying 'you'?"
USUALITY (Usuality)	Implicit or explicit use of the metalanguage of usuality to talk about how or why authors use language to describe how often something occurs in the past. T: "This is high, you do it a lot. (She points to the bottom of the chart.) "This is low, when you rarely do things. And in between when it is so and so. If you pick up a gallon of milk as something you do a lot, where would I place a lot?" S: "High."
LIKELIHOOD (Likelihood)	Implicit or explicit use of the metalanguage of likelihood to talk about how or why authors use language to describe the certainty of something happening in the future. T: "It SEEMS the cane toad's toxins do not hurt the meat ants. It SEEMS. How certain are they?" S: "Not that much."

APPENDIX C – INTERVIEW PROTOCOL

Teacher Belief Interview
(Adapted from Richardson, Anders, Tidwell, and Lloyd, 1991)

Introduction: "The purpose of this interview is to get an understanding of your beliefs about the characteristics of proficient readers and writers at your grade level and how children become proficient readers and writers. Let's begin with reading."

1. When children enter fourth grade, what should they be able to do with respect to reading?
2. What accounts for the difference between good and poor readers at your grade level?
3. What is the most helpful way to improve the reading proficiency of a poor reader at your grade level?
4. How do you define reading comprehension? (What is included in that)?
5. Could you describe the way you teach reading comprehension?
6. What is the most challenging aspect of teaching reading comprehension?
7. How does functional grammar instruction support your reading comprehension instruction?

Let's turn to writing…
8. When children enter fourth grade, what should they be able to do with respect to writing?
9. What accounts for the difference between good and poor writers at your grade level?
10. What is the most helpful way to improve the writing proficiency of a poor writer at your grade level?
11. Could you describe the way you teach writing?
12. What is the most challenging aspect of teaching writing?
13. How does functional grammar instruction support your writing instruction?

We have one question that has to do with the teaching of traditional grammar:

14. Do you teach traditional grammar? What role does it play in your curriculum?

Now some more general questions about FGA and your teaching practices:

15. If you were to think of a metaphor for FGA instruction, how might you characterize it?

16. If we think of the "tools" teachers use to support student learning, it appears that Arabic is a tool for you in your instruction. Can you talk a bit about how you perceive your use of Arabic as a support for student learning?
    • Do dialect differences prohibit some students from understanding the Arabic you use? How is Arabic different from English in its structure?

- Does it have the functional grammar features that you taught? So, for example, were you ever able to translate the concept of participants or processes into Arabic to draw a parallel or explain an FG feature in Arabic and referring to the Arabic language?

17. You have been trained in sheltered instructional practices to support language learners and FGA to support ELs meaning-making with text, correct?
   - Do these two sets of strategies complement one another?
   - How do these two sets of tools or teaching strategies fit together for you?

18. Many of the FG lessons were conducted whole class and were designed to be that way. How did the structure of these lessons compare with how you usually teach language arts?

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