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Discourse Analysis and Functional Grammar
in the Classroom: The Summary of a Mini-Reading Course

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This paper is a brief collection of thoughts based on a series of readings I did during the fall of 2008. In advance of my research practicum, in which I plan to investigate the classroom discourse of the conclusions to rich mathematical tasks, I decided to take the opportunity to expand and strengthen my background in the general framework of discourse analysis. Thus, I designed a mini-reading sequence that moved from the general to the specific.

In the first section below, I summarize pertinent chapters from James Gee's *An Introduction to Discourse Analysis: Theory and Method* (1999) which serve as a general overview for what is to follow. Since discourse analysis has many instantiations, I use the second section to focus on a particular type of discourse analysis—functional grammar (Halliday & Matthiessen, 2003)—and some of its key aspects that I anticipate will be integral in my practicum work. Finally, in the third section, I look specifically at the work of Frances Christie (2002) who used the functional grammar framework in education research.

A General Introduction to Discourse Analysis

The word *discourse* refers to more than just talk—it encompasses any meaningful use of language as well as communicative gestures (Gee, 1999a). By looking closely at discourse, we can gain information regarding two of the primary functions of language: “to support the performance of social activities and social identities and to support human affiliation within cultures, social groups, and institutions” (p. 1). In other words,

discourse is inextricably linked to the enactment of social activities (e.g., classroom lessons), the formation and maintenance of social identities (e.g., students as capable learners), the interactions of social groups (e.g., classroom communities), and the establishment of social institutions (e.g., schools). Discourse analysis, therefore, is able to meet two calls in the field of education research: first, the call for sociocultural and contextual considerations, and second, the call for a more scientific basis for claims. Discourse analysis, by definition, gives a lot of attention to the contexts of learning, and it rests upon observable behavior such as speech, written text, and gestures, requiring less appeal to invisible structures and states.¹

Discourse analysis as a research method also has the possibility of bridging the divide between theory and practice, or basic and applied research. This possibility arises from the “magical property” of language as described by Gee (1999b): language reflects the situations in which we are communicating, as we modify our speech and use appropriate language for the circumstances, and simultaneously constructs that very situation (p. 10). Correspondingly, discourse analysis can provide insight about the way things are in a given situation, a sort of basic research, and can also provide insight into the way in which that situation came to be, opening the door to applied research. In mathematics education, for instance, discourse analysis could provide information about students’ conceptions of what it is to do mathematics by looking at how they talk and write about it (reflecting the situation) and could also provide guidance to teachers by

¹ Some discourse analysts maintain that these observable behaviors are the be-all-end-all of the analysis. Others assume that discourse can be a “pointer” to invisible cognitive structures or beliefs. It is beyond the scope of this paper to address this important philosophical debate, but for the present I will adopt the latter stance.

exposing the ways in which their language use characterizes mathematics (constructing the situation).

Language Constructions and Tools of Inquiry

According to Gee (1999b), every act of speech or writing constructs in some way and to some degree the following seven areas of “reality.” Language marks things as *significant* or insignificant to varying degrees. Language enacts *activities* and allows others to recognize that those activities are taking place. Language is used to build *identities* or roles. Language signals what sorts of *relationships* exist (or are desired) between those involved in communication. Language conveys perspectives on *politics* and the distribution of social goods such as blame, responsibility, and value. Language *connects* certain things to others and deems relationships between things as relevant or not. Finally, language constructs *sign systems and knowledge* and is used to bestow privilege upon particular sign systems or knowledge claims over others.

These seven areas that are constructed by the use of language can be a basis for meaningful and appropriate research questions to be investigated via discourse analysis. For example, a research question could be asked about what activity a piece of language from a science lesson is being used to enact (e.g., see Lemke, 1990) or a research question could be asked about what knowledge claims about mathematics are being privileged by a particular classroom interaction. To investigate such questions, Gee (1999c) pointed to four possible tools of inquiry. I survey them briefly below.

By investigating the use of different *social languages* (e.g., colloquial versus scientific) and how they are mixed together, aspects of many of the language

constructions of reality (particularly significance, activities, relationships, and sign systems) can be exposed and analyzed (e.g., see Chapman, 2003, for the case of colloquial language moving toward more formal mathematical language). A researcher could also pay attention to the different *discourses*—in this case referring to the different ways in which “language, actions, interactions, ways of thinking, believing, valuing, and using various symbols, tools, and objects” are used to enact a particular recognizable social identity (Gee, 1999c, p. 21)—as a means of analyzing different language constructions (particularly activities, identities, and relationships). The *intertextuality* tool of inquiry refers to an investigation into the cross-referencing of texts and the ways in which the piece of discourse in question relates to other things that have been said or written. This tool can be especially useful when examining the construction of significance, relationships, and connections. Finally, language can allude to more than just other pieces of text but also to broad *conversations* that are known to those engaged in the discourse. For instance, if someone in a mathematics classroom says, “I don’t see the point to this,” they may be referring beyond their particular circumstance to the larger conversation about the (perceived) uselessness of mathematics in real life.

While these constructions of language can guide research questions and these tools of inquiry can provide focus in analysis, Gee is quick to point out that more than just language is at play in any situation (1999d) and that other tools of inquiry may be more appropriate in certain instances of discourse analysis (1999c).

Subjectivity and Validity

When conducting discourse analysis, it is always important to keep in mind the fact that spoken or written words do not contain meaning and that language does not merely transmit knowledge from one person to another; meaning is always constructively subjectively by those engaged in the discourse. This is also true of researchers who study and analyze discourse; they too bring their own subjective interpretations and meaning-constructions to the discourse they analyze. Subjective choices occur as early as during the process of transcribing an interaction (Gee, 1999d). Thus it is imperative for discourse analysts to be mindful of their own biases and take some or all of the following steps toward assuring validity (or trustworthiness), otherwise the result may be that a single piece of text has as many different analyses as there are researchers.

1. *Convergence*. Validity is increased when various perspectives (e.g., focus on social languages or intertextuality) and various constructions of the language (e.g., identities, relationships, and connections) are compatible and come together to support a common conclusion.
2. *Agreement*. Validity is increased when other discourse analysts or other types of researchers support the conclusions.
3. *Coverage*. Validity is increased when the conclusions are able to make sense of what came before or after the piece of data being analyzed, or when it can be applied to similar situations.
4. *Linguistic Detail*. Validity is increased when the conclusions are tightly tied to details of linguistic structure such as grammatical devices. (Gee, 1999d, p. 113-114)

Another sign of validity is the agreement and verification of conclusions, not from other researchers, but from those who participated in the discourse under analysis (Creswell, 2009).

As this general introduction implies, there are many varieties of discourse analysis because there is such richness in human language. I now turn to a particular framework for discourse analysis that pays particular attention to the grammatical functions of language and so provides a foundation of validity based on attention to linguistic detail.

Selections from Functional Grammar

Functional grammar has as its goal the complete description and explanation of the meaning-making capabilities of language, particularly modern English (Halliday & Matthiessen, 2003a). To do this, grammarians look at texts—“instances of language, in any medium, that make sense to someone who knows the language” (p. 3)—and ask questions about why it means what it does, why it is valued as it is, and what it reveals about the broader system of language. Texts in this perspective have properties that are reminiscent of the magical property Gee ascribed to language; namely, text only means what it does because of its relation to an overarching linguistic system and simultaneously the linguistic system is constructed by various individual texts.

The functional grammar program is incredibly expansive and detailed, addressing all levels of text (e.g., sentences, phrases, words, phonemes) and incorporating specific tools of linguistics. It is beyond both the scope of this paper and my personal capabilities to address the entire breadth and depth of functional grammar. Instead, I will focus on a

few of its conceptual frames that I believe will be useful in my future work, beginning with a brief overview of the metafunctions of language.

According to functional grammar, all instances of language serve the purpose of making sense of our experience—the *ideational* metafunction (which can be subdivided into experiential and logical components²)—and also of acting out our social relationships—the *interpersonal* metafunction (Halliday & Matthiessen, 2003a). (There is also a *textual* metafunction which refers to aspects of the organization of language itself.) For example, a piece of text from a mathematics classroom interaction that features students talking about a geometric pattern contains language used for the purpose of making sense of the mathematical activity and simultaneously contains language that positions the students relative to each other and to the mathematics (e.g., as capable learners). Analysts at a given point in time may focus more on the ideational or the interpersonal aspects of the discourse, but functional grammar reminds us that the other is never absent.

The following conceptual frames provide tools with which to uncover the ways in which the above metafunctions of language are enacted.

Processes, Mood, and Modality

Experiences are perceived as a flow or continuous series of events, and functional grammar identifies different types of *processes* that language systems employ to organize and make sense of these experiences (Halliday & Matthiessen, 2003c). A distinction that is made even among infants is that of mental (or inner) versus material (or outer)

² This subdivision points to one of the challenges of mathematics education as it tries to bridge the gap between experiential and logical meaning-making.

experiences. The former includes processes such as feeling and thinking, whereas the latter includes processes such as happening and doing. There are also relational (e.g., classifying, having attributes), existential (e.g., existing), behavioral (e.g., seeing), and verbal (e.g., saying) processes, though the lines of separation are not always clear (e.g., thinking has elements of mental and verbal experience). These categories of processes, and the associated detail about how words construe them, are useful when analyzing discourse. For example, a researcher could look at text from a mathematics classroom and use this functional grammar framework to make the case that the mathematics therein is being characterized as a material, “doing” process rather than a mental, “reasoning” process (e.g., see Thompson, Philipp, Thompson, & Boyd, 1994).

Mood in functional grammar refers to whether a clause is indicative or imperative (Halliday & Matthiessen, 2003b). The types of moods contain further subtypes as follows:

- Indicative (i.e., exchanging information)
 - Declarative (i.e., making a statement)
 - Affirmative
 - Exclamative
 - Interrogative (i.e., asking a question)
 - Yes/No
 - Wh- questions
- Imperative (i.e., exchanging goods and services)

This framework and the tools provided for identifying the mood of a clause give researchers a basis for making claims about the ways in which information is being shared and meaning is being construed among those participating in the discourse. Is

there information being exchanged or only a series of commands? Is the talk entirely declarative or are there questions being asked? What types of questions are being asked and of whom? Functional grammar can supply validity to purported answers to such questions.

In addition to mood, a clause can also vary along the dimension of *modality* (Halliday & Matthiessen, 2003b). The modality system of language “construes the region of certainty that lies between ‘yes’ and ‘no’” (p. 147). Propositions vary from the positive pole (‘it is so’) to the negative pole (‘it isn’t so’) with degrees of probability (possibly/probably/certainly) or degrees of usuality (sometimes/usually/always) in between. Proposals vary from the positive pole (‘do it’) to the negative pole (‘don’t do it’) with degrees of command (allowed to/supposed to/required to) or degrees of offer (willing to/anxious to/determined to) in between. This linguistic system of modality offers a framework for the analysis of discourse in mathematics classrooms. For example, if a teacher can be shown to speak most often with high modality, this would provide evidence that the teacher is a powerful authority in the classroom with respect to mathematical knowledge (propositions) and directing activities (proposals). Contrastingly, if a teacher speaks with low modality, this may converge with other evidence that there is student ownership of mathematical knowledge and that the activities are somewhat student-directed.

There exist many other ways in which the work of functional grammar can provide frames for the interpretation of educational data. I have chosen the above examples because I expect them to inform the discourse analysis in my practicum. Next, I

will look briefly at the way in which another education researcher, Frances Christie, employed functional grammar in her work.

An Example of Functional Grammar in Education Research

Christie (2002) used functional grammar to “look at how language users exploit and deploy the language choices to make meanings” (p. 13) within classrooms. As was alluded to above, Christie found that this theoretical framework illuminated various aspects of the classroom discourse and gave her a language with which to discuss the meaning-making that was occurring.

For example, Christie identified different process types and where they were deployed in a text “to make judgments about the kinds of experiential meanings in construction” (p. 14). For example, “You should consider this” (p. 13) displays a mental process of cognition, whereas “You’ve got to follow the instructions” displays a material process. These examples are also useful in that they exemplify the first of two classroom registers (or sets of language choices) that Christie found in classroom texts. This first register, termed the regulative register, has to do with communication about behaviors in the classroom. The second register, termed the instructional register, has to do with the content being taught and learned (p. 14-15). Examples of utterances within the instructional register would be “let’s look at the mammal room” and “you’ll be making an exact replica of a catapult.” Of course, the two registers are not separate (as we can see by the regulative nature of the process types in the examples from the instructional register, wherein students are directed to look and informed that they will be making

something). In fact, nearly every piece of text lives in both registers, but to varying degrees.

Within the interpersonal metafunction, Christie noted the role of mood in that teachers can offer information (“Today we’ve got another simply story which is called ‘My Lunch’”) or they can demand it (“What’s a barrel?”). Modality also comes into play as the teacher may strongly indicate something’s importance (“We’ve got to do a lot of concentrating”) or may try to guide behavior more subtly (“Now a lot of work may be with a partner, so you’re probably best to sit next to somebody”). Over the course of a text and subsequently over the course of multiple texts within a classroom, language use of this sort establishes the “relative roles and responsibilities” (p. 16) of teacher and students.

Also within the domain of the interpersonal metafunction, an analysis of pronoun use can shed light on the relationships between teacher and students, as Christie found when she noted that teachers often use first person plural forms (e.g., “we”) to build solidarity at the onset of an educational task and second person (e.g., “you”) when explicitly directing student behavior. In this way, the discourse analysis informs us of ways in which teachers build communities of learners while also maintaining their role as the leader of the classroom.

Conclusion

This paper, though based on only a limited selection of readings, contains some important thoughts about discourse analysis that will inform my work in both the near and distant future, I expect. It began by pointing to the value of an analysis of discourse,

which stems from the fact that language both reflects and constructs reality with respect to those engaged in communication. After identifying domains for which discourse analysis is especially appropriate and formulating several ways in which validity can be achieved, it turned to specific linguistic details of discourse as set forth by the functional grammar program. Finally, some brief examples of how this work might look in education research were presented. Though I have much more to learn, I now feel as though I have meaningfully entered into the discourse around this particular theoretical perspective and methodology.

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