

# SCIENTIFIC CONCEPT DEVELOPMENT IN THE ENGLISH LANGUAGE ARTS CLASSROOM

by

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## Abstract

This study uses discourse analysis to examine how scientific concepts (Vygotsky, 1997) develop in an English Language Arts class over the course of one curricular unit. The study focuses on how two students in one 12<sup>th</sup> grade English Language Arts classroom develop towards the scientific concept of summary. The study examines the teacher's classroom discussion of the concept of summary, and the students' development of the concept of summary. The development is investigated using Systemic Functional Linguistics to analyze the classroom and interview talk from both teacher and students. The use of concept mapping and SFL analysis (Halliday, 1994) focus on transitivity, interpersonal metaphor, and clause linking devices to enhance, elaborate, or expand the concept's web of relations. Understanding the initial developmental level of the concept helped to examine how the teacher's discourse surrounding the concept mediated the concept of summary. Language and schooling as a part of the teaching and learning context and pedagogical issues are discussed.

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## PREFACE

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## 1.0 INTRODUCTION

This study investigates how scientific concepts, as defined by Vygotsky (1997) in *Thinking and Speech*, develop in one secondary school ELA classroom in the context of talk and how scientific concepts are manifested in the artifacts that students produce as part of their English course. This study is set in the framework of Lev Vygotsky's theory of semiotic mediation, notably talk-in-interaction during problem-solving tasks. The overarching goal of this study is to examine how discursive mediation provided during instruction by the teacher supports the transformation of spontaneous concepts to scientific concepts in students. To this end, the analysis and interpretation of discursive interactions between teacher and students will be conducted within the framework of Systemic Functional Linguistics as put forth by M.A.K. Halliday.

## 1.1 LEV VYGOTSKY

“Real concepts,” Russian psychologist Lev Vygotsky (1987) wrote, “are impossible without words, and thinking in concepts does not exist beyond verbal thinking. That is why the central moment in concept formation, and its generative cause, is a specific use of words as functional ‘tools’” (p. 107). According to Vygotsky, words, as psychological tools (Kozulin, 1990), are used to mediate our understanding of cultural practices within any given society or community. Within the community of ELA classrooms, students use language to learn, learn language, while

simultaneously learning about using language (Halliday, 2003), which makes the ELA classroom a particularly interesting venue for a study of scientific concepts.

In describing concepts, Vygotsky (1998) wrote:

A real concept is an image of an objective thing in its complexity. Only when we recognize the thing in all its connection and relation, only when this diversity is synthesized in a word, in an integral image through a multitude of determinations, do we develop a concept. According to the teaching of dialectical logic, a concept includes not only the general, but also the individual and the particular. (p. 53)

The synthesis of a concept in a word is not a closed system, but one where connections and relations continue to develop and re-reorganize themselves as the concept develops over time and as other concepts interact and overlap with each other. Individual and particular connections and relations between concepts work to create a generalizable whole, which is embedded within a system of relations and connections synthesized into a word. For this reason, a concept can be said to be a “synthesis of determinations” that emerges from the interaction of one concept with another.

Concept development as part of biological and social life of the child, occurs as the child becomes an adolescent (Vygotsky, 1987, 1998). Although concept development often parallels human development, concept development is not merely “the simple maturation of elementary intellectual functions,” but is a fundamental change in the “internal, intimate, structural nature” (Vygotsky, 1998, p. 38) of the adolescent. The adolescent begins mastering concepts and she begins breaking the concrete bonds of her experience and begins to abstract qualities and features from the concrete circumstances of practical activity. These concepts, particularly scientific

concepts, which, according to Vygotsky and others (Daniels, 2001; Kozulin, 1990; Lee & Smagorinsky, 2000; Panofsky, John-Steiner, & Blackwell, 1990; Wells, 1999) are developed only in schooling situations (see literature review for more), represent a complex web of relationships and reality in its deepest form. In the words of Vygotsky, “understanding reality, understanding other, and understanding oneself... is what thinking in concepts brings with itself” (Vygotsky 1998 p. 49). Thus, as a child reaches adolescence they move from a concrete understanding of particular circumstance to a conceptual understanding of reality that can be reflected upon, abstracted, and applied to other contexts.

Concepts are not reifications but processes with complex and diverse connections and relations to other concepts (Vygotsky, 1998) that is, a synthesis of determinations. From the perspective of Vygotskian semiotic theory, the synthesis of determinations comprising a concept is represented in the word. Words are joined to other words creating a language of thought, where language “is not the means to express an already prepared thought, but to create it... not a reflection of world contemplations that has developed, but an activity that composes it” (Vygotsky, 1998, p. 49-50). Language (or word-concepts) is a tool that mediates our reality and that brings other thoughts into being. “The content of thinking becomes an internal conviction of the speaker, the directedness of his thought, his interest, the norm of his behavior, his desire and intention” (p. 52). These processes, our interests, our behavior, our desires, and our intentions, comprise the architecture of language and language is what “transforms these processes into meaning – [it] *semiotizes* them” (italics original, Halliday, 2003, p. 29). Indeed, our language, our very words that embody concepts give meaning to our experiences and are laden with the cultural and historical relations and connections of the community in which concepts are forged

and words are used. In this way, it can be said that concepts are derivative of social, cultural and historical life.

Words, in ELA and other subjects, mark culturally valued concepts. These concepts are ones the research community, the curriculum writers, the federal, state and local administrators value as worth knowing, and indeed, assess success and achievement through a student's ability to imitate or reproduce these concepts. From a Sociocultural perspective, however, mere imitation and definition of words is not indicative of conceptual development. What is indicative of conceptual development, particularly school based scientific concepts, is a student's ability to abstract, generalize, and consciously use the concept in novel situations (Vygotsky, 1987, 1998). This study examines how, or indeed whether, two students with teacher and researcher interaction can abstract, generalize and consciously use a concept[s] in a novel situation in an eleventh grade ELA classroom.

## **1.2 VYGOTSKY AND LEARNING**

Vygotsky's ideas about learning and development and their relationship to education have been explored in depth for the last thirty years (Daniels, 2001; Forman, Minick, & Stone, 1993; Kozulin, 1990; Kozulin, Gindis, Ageyev, & Miller, 2003; Langford, 2005; Lantolf & Appel, 1994; Lee & Smagorinsky, 2000, 1998; Wertsch, 1985; Wertsch, Del Rio, & Alvarez, 1995; Wertsch & Tulviste, 1996). Although concept and concept development have been popularized in the West as a part of developmental psychology and educational psychology for some time (see Shulman & Quinlan, 1996; Stevens, Wineburg, Rupert-Herrenkohl, & Bell, 2005 for excellent overviews), these branches of psychology have not always situated themselves within a



Vygotskian framework. Additionally, the work on concept development in classroom settings has focused largely on academic subjects outside of the English Language Arts curriculum. For example, in math, researchers have examined how students develop an understanding of “rectangles of equal area but dissimilar appearance” (Forman & Larreamendy-Joerns, 1998, p. 109). In this study, classroom discourse and documents were used to analyze the development of the concept of “areas of rectangles” and to provide evidence of the mathematical concept being used by students or teacher during instruction. The Forman and Larreamendy-Joerns study was also framed in Grice’s Cooperative Principle to understand how the teacher’s register choices affected student learning. Classroom-based research that investigates the consequential role of talk on conceptual development, as in the Forman study, has also been conducted in science. In the context of ELA instruction, research on concept development within the Vygotskian psycholinguistic tradition has been sparse, however<sup>1i</sup>.

### **1.3 ENGLISH LANGUAGE ARTS CONTEXT**

One reason that research into concept development in ELA is rarely conducted is because a concept in ELA is difficult to define and examine compared to a rather straightforward concept in math. For example, certain static features bind the area of a rectangle, as a concept. The area can be found by using  $\text{Base} \times \text{Height}$  and by establishing accurate measurements of each of these two parts of the equation. I do not argue that this concept is easy for students or that the concept is not complex. What the issue is here is that area in mathematics has empirically verifiable attributes that do not rely exclusively on language to define its characteristics, although some may claim that mathematics is one among many semiotic systems with which we think and make

meaning. In the domain of mathematics, however, tools, other than language, such as a ruler and measurements, can be used to provide values to execute the equation and verify results. In other words, language is not uniquely and simultaneously the content and vehicle of instruction. For ELA though, language is both what is learned, and the vehicle for the learning (Halliday, 2003). The valued concepts in ELA also have a value attached that tools such as rulers lack. For example, what a successful utilization of a literary device (see below) is for one teacher or administrator, may be unsuccessful for other teachers or administrators (Wells-Jopling, 2006).

In this study, I look at how scientific concepts associated with the English Language Arts curriculum develop by understanding how this development occurs in the talk between teacher and student during instruction in a secondary school. ELA concepts can only be represented and illuminated by using the tool of language or the material product of words on paper. For example in Pennsylvania, some ELA concepts students must know are how to use “literary devices” or how to write “research papers, analyses, evaluations, essays” (Education, 2006, #1.4.5,8,11 & 1.4.11 respectively). These concepts, abbreviated and synthesized in a word and stated as goals by the state, are highly complex and determined by their hierarchical organizations that involve other complex concepts. For example, to understand and use a literary device a student must understand a host of other related concepts such as, metaphor, similes, and personification as part of the web of relations that work to create the concepts literary devices. Moreover, the relationship of one concept to another within this web is hierarchical (Vygotsky, 1987, 1998) and requires an understanding of how certain concepts are embedded, subordinated, or controlled by other concepts.

Understanding this web of relationships is developmental in the sense that understanding is transformed over time in the classroom as new concepts and conceptual relations emerge and,

in this way, can be said to be scientific. The scientific concept of *essay*, for example, is synthesized in the word as a concrete image with all its complex understanding. A successful essay is comprised of a number of other valued ELA concepts serving to create a concept of *essay* that is truly complex in its structuring. The state, Pennsylvania in this case, wants a competent written document showing mastery of written conventions, which include using precise and specific language, using cause and effect, using primary and secondary sources, and employing various methods to develop a main idea (Education, 2006). This complex web of relations must be abstracted and consciously used and synthesized in the resulting concept of *essay* for the scientific concept of *essay* to be successfully shown by the student. *Essay* as a concept takes on greater importance when, as ELA teachers will attest and a recent report stated (Graham & Perin, 2007), the concept is not just the basis for the ELA classroom, but should also be portable as a concept to other disciplines, and the concept should serve as a building block for the concept of *essay* across curricular subjects such as history, social studies and the sciences.

#### **1.4 THE STUDY**

This study uses interviews, classroom discourse and two students' final written product to examine how *summary*, a valued ELA concept, develops in an ELA classroom. Students and teachers are being held to high end product demands in the form of standardized exams. In ELA, essay exams ask students to display the complex relations that comprise summary, and this scientific concept of summary is the culmination of teaching and learning within the classroom. This study examines how this learning develops via talk in the classroom. This study also

examines what characteristics a developing concept may have at given moments of the unit cycle.

Because valued ELA concepts are part of the state assessment, it seems vital to know how these, indeed if these, concepts are being developed within an ELA classroom. This examination of scientific concept development helps us understand how “images of an objective thing in its complexity” are *actually* developed in a classroom, and indeed, whether they are in fact developed within the time frame text book writers, state and local officials, curriculum designers and teachers value as a time period in schooling: the curricular unit.

## 2.0 LITERATURE REVIEW

In this chapter, I discuss why Vygotsky developed his thinking about scientific concepts, I describe why it is important to focus on adolescents and schooling when investigating the development of scientific concepts, and I review the literature of scientific concepts and schooling.

### 2.1 VYGOTSKY AND CONCEPTS

Vygotsky developed his ideas about concepts and concept formation as a reaction to experiments in psychology, which tried to explain the concept as a static and fixed entity. This stasis he argued could be understood by examining experiments, which focused on what the child *already* knew to be true about a word or an idea. The focus of the experiments was on word *definition* or how a word tracked across other like word definitions, which for Vygotsky (1987)<sup>ii</sup> studied the “child’s knowledge and experience, or ... his linguistic development, rather than a study of an intellectual process in the true sense” (p. 121). This display of linguistic development took the word to be “a purely verbal plane” (ibid) where the word’s link to reality and its development remained unexamined.

Vygotsky (1987) focused his experiments by using a method which looked at the “functional use of the words or other signs as means of actively directing attention, partitioning

and isolating attributes, abstracting these attributes, and synthesizing them” (p. 130). This functional use of the word was vital to the process of concept formation, The concept was to be viewed not by isolating one of the above (i.e. isolating an attribute) but by examining the word as concept and “as a function of socio-cultural development, taking both the content and mode of the adolescent’s thinking into account” (p. 132).

For Vygotsky (1997), development occurred both in the context of the situation, and the context of the culture. Schooling, for example, develops the concept of *family* in a biology class different than a life science class. But the context of culture, the school, and the context of situation, the class, and their various modes of developing knowledge (i.e. texts or papers) shape the functional use of the concept *family*. This idea of content and mode will play a critical role later in Chapter 3 when I describe how I analyze the development of adolescent scientific concept.

### **2.1.1 Spontaneous concepts: the foundation of scientific concepts**

Spontaneous and scientific concepts pass through the same phases and stages of formation. Briefly, both begin as heaps, or “unordered and unformed collections” where the “word meaning is an incompletely defined, unformed, syncretic coupling of separate objects” (p.110). At this point in development the child may use trial and error to help compose a group of related objects.

Concept formation continues from heaps to complexes where objects are linked together by connection between objects, and by “the establishment of relationships among different concrete impressions” (p. 135). But these relationships are unstable and may only be linked to one attribute across the objects where this one attribute fails to continue to be relevant to the objects. For example, for the first stage of complex development, the *associative complex* stage,

a child may associate the color red with “barn” and relate the color red with a “barn” only to discover bicycles or cars can be red, as well. Vygotsky (1987) noted that complex components are concrete and factual; whereas, concept components are abstract and logical. Complexes may have a factual bond present, but will lack a logical unity.

Complexes move from the above noted *associative complex*, to *collections* (e.g. a group of blocks each of a different color), to *chains* (e.g. where the links between objects will not be logical), to *diffuse complexes* (e.g. where attributes between objects are unstable or unreal), to *psuedoconcepts*, which are objects united by visible likeness but fail to logical follow in their ultimate grouping. For example, uniting a whale and a tuna as types of fish because they share the feature of *living in the sea* with each other. This grouping breaks down when we learn that though both are vertebrates, the whale is a warm-blooded mammal, where the tuna is a cold-blooded fish. These various stages named above do function to create bonds and relations (Vygotsky, 1987), which is something spontaneous concepts share with scientific concepts.

This very cursory overview is not meant to short change an understanding of complexes and their hierarchical nature, but an in depth understanding of the differences between the stages and how they themselves logically follow is beyond the scope of this work. Complexes, particularly psuedoconcepts, may in fact play a role in this paper, but one, which will have to await the analysis of the data.

### **2.1.2 Scientific concepts**

A scientific concept, or “real concept” was defined by Vygotsky (1997) as an “image of an objective thing in its complexity. Only when we recognize a thing in all its connection and relation, only when this diversity is synthesized in a word, in an integral image ... do we develop

a concept” (p. 53). The development of a scientific concept, or word, with its diverse connections and webs of relationships, Vygotsky (1987) said, was not “an automatic mental habit ... mastered through simple memorization” (p. 169), but was rather a diverse set of functions such as, “the development of voluntary attention, logical memory, abstraction, comparison, and differentiation” (p. 170). These functions were developed with the aid of an adult during schooling, and simple memorization of the concept or complex webs of relationships for any one word, was “pedagogically fruitless” (ibid) for Vygotsky.

Vygotsky (1987) maintained that scientific concept development “does not part with the more elementary forms of thinking. In quantitative terms, these more elementary forms continue to predominate in many domains of experience for a long time” (p.160). It is in schooling where a systematic and deliberate introduction to scientific concepts begins. It is not that spontaneous or everyday concepts are left behind, in fact “during the entire course of the child’s development, two antagonistic groups of concepts [spontaneous and scientific] must exist. All that changes with age is their quantitative relationship” (p. 175). The interplay between spontaneous and scientific concept development is dynamic. This dynamic interplay between spontaneous concepts and scientific concepts interests educational researchers because scientific concepts are in fact the ones valued and dealt with exclusively by school and the process of learning in school, in other words by overt instruction. These scientific concepts learned in school are indicators of intellectual development for the students. The students are asked to transfer these concepts from one schooling situation to another, and are asked to show mastery of these concepts in high stakes exams.



### 2.1.3 Scientific concepts and Adolescence

Vygotsky (1987) explained the base where people begin the process of concept formation. “Only with the transformation of the child that occurs in adolescence does the decisive transition to thinking in concepts become possible” (p. 130). This seems critical to understanding how and *when* concept development becomes a part of our intellectual development because Vygotsky was not as concerned with *biological* age level development as he was about *mental* age of development of school children (Burmenskaya, 1994; Daniels, 2001). Concept formation, Vygotsky (1987) argued, occurs as a “*complex and true act of thinking* that cannot be mastered through simple memorization. The child’s thought must be raised to a higher level for the concept to arise in consciousness” (italics original, p. 169). This consciousness, or awareness of the concept itself, and its ultimate self-regulation, the “*complex and true act of thinking*” must be developed in interaction with the teacher.

“Fundamental to the process of concept formation is the individual’s mastery of his own mental processes through the functional use of the word or sign. This mastery of the processes of one’s own behavior through auxiliary means attains its final form only in adolescence” (p. 132). In regards to concept formation and development then, it is critical the student’s age be within adolescence because it is in this age period where the requisite level of the child’s mental development and self-regulation can occur. This age period, adolescence, is not a fixed period of years, but is relevant to the individual’s cultural and societal development. What may be adolescence for one culture might be the onset of adulthood for another. For example, one encyclopedia<sup>iii</sup> listed The World Health Organization (WHO) as designating adolescence as the period from ten to nineteen years of age; whereas, in the United States the period started around the ages of twelve to fourteen, and lasted until either nineteen or twenty. This developmental

period, biological and social, is important to note when considering the age of the participants in any work on concept development

#### **2.1.4 Schooling**

“Research indicates,” Vygotsky (1987) wrote, “that what is central to this process [concept development] is the functional use of the sign or word as the means through which the adolescent masters and subordinates his own mental operations and directs their activity in the resolution of the tasks which face him” (p.131). Functional tool use extends to both spontaneous concepts and scientific concepts. Spontaneous concepts or everyday concepts are those, which develop “when his thought is left to itself” (p.178). In other words, spontaneous concepts develop without purposeful interaction and certainly develop outside of classroom instruction and schooling. Spontaneous concepts are part of the immediate experience of the child. Vygotsky (1987) gave Piaget’s example of the student using the word *because* to highlight a spontaneous use of the word. “Piaget asked seven and eight year olds the meaning of the word *because* in the sentence, ‘I am not going to school tomorrow because I am sick’” (p. 182). The children responded by either saying *because* meant the student was sick, or that *because* meant the student will not go to school. “In short, these children simply did not have the capacity for conscious awareness of the word’s definition, although they are able to use the word spontaneously” (p.182). Children, Vygotsky argued, understood the meaning of the sentence, but were incapable of using *because* deliberately, which is a requirement of a scientific concept. “When he uses the conjunction ‘because’ spontaneously he uses it correctly but he cannot apply it intentionally and voluntarily” (p.183). Vygotsky argued that only through instruction and learning can the child learn the deeper meaning of the word *because* and begin to use it deliberately and in varying situations.

In sum, a scientific concept (Vygotsky, 1987, 1997):

- occurs in a formal context; a context of teaching and learning
- is available for development beginning in adolescence
- is portable to novel contexts and situations
- is generalizable with other concepts (can be compared with other concepts and can be differentiated from other concepts)
- is complex and has a logical web of relationships and determinations
- can be used voluntarily and consciously
- can be synthesized in a word

## 2.2 SUMMARY AS A SCIENTIFIC CONCEPT

This study focuses on the concept of summary as it is taught during one curricular unit. Summary was taught as a part of the genre of book review. Winograd (1984) linked deficits in strategic skills to eighth-grade students' difficulties with summarization. Summarization, as a task, was selected because, as Winograd and others (Brown, Day, & Jones, 1983; Gallini & Spires, 1995) wrote, the ability to get across the main idea or the gist of a text was important across school subjects, and summarization had a relationship to reading comprehension. Summarizing as a skill was argued to be about forming *macropositions*, or forming theories about main points or as Butcher and Kintsch (2001) pointed out, students needed to be able to foreshadow the main discussion from the summary. This ability to theorize though was lacking for even advanced students when it came to being able to theorize about expository texts

(Kincade, 1996; Kintsch, 1990) possibly because a student lacked explicit experience with the genre of a particular text (Armbruster, Anderson, & Ostertag, 1987; Kincade, 1996; Kintsch, 1990). Brown, Campione and Day (1981) and others (Brown, Campione, & Barclay, 1979; Kintsch & van Dijk, 1978) cited summarization as an essential tool when trying to understand, comprehend and retain information from written texts.

The concept of summary or of summarizing required a variety of attending concepts (Armbruster et al., 1987; Brown et al., 1981; Butcher & Kintsch, 2001; Hidi & Anderson, 1986; Kintsch & van Dijk, 1978). For the concept of summary, the student had to be able to *delete* unnecessary information and ignore information that was important but redundant. The student had to understand the genre of the text from which the summary was based on and had to be cognizant of the audience for the written summary (i.e. personal or outside reader). The students made generalizations or developed pseudoconcepts (i.e. Pontiac, Chevy, Ford were *cars*) or understood grammar to be important in making meaning (i.e. recognizing past tense actions via verb tense to be an important subcomponent of generalizations). The student had to be able to recognize the paragraph as a delineation of information and had to select the *topic sentence* of the paragraph or create a *topic sentence* if one was not provided them in the text. These textual sign posts were important for understanding the macrostructure of texts (Kintsch & van Dijk, 1978; Sherrard, 1989)

In the literature noted above, the web of relations that work together to function as the scientific concept of summary were heavily reliant of scientific concepts themselves. The concept of *important* information, for example, demanded that students know *important* from *unimportant* information in a reading. But this concept, *important*, was never outlined in the literature. Who judged what information was to be deemed *important*? Similarly, *generalizations*

as a concept was not described by other concepts, so that one could understand whose generalizations mattered, and what specifically were the generalizations based on in the texts? While the scientific concept of summary has been investigated, the conceptual relations of the concept itself has been left out of the discussion.

## **2.3 VYGOTSKY AND THE CLASSROOM**

This section of the chapter is divided into four parts. It begins with a brief overview of the influence Vygotsky's ideas have had on content areas in schooling such as math, science and learning other languages. This overview is followed by a more detailed review of how educational researchers have used Vygotsky's theory of scientific concepts to help explicate learning and development in the classroom. Following this section is a review of the complementary aspects of Systemic Functional Linguistics and Vygotsky's ideas. The final section will review the small amount of work done with scientific concepts in the area of the English Language Arts, which is used to help motivate the study I am proposing here.

### **2.3.1 Vygotsky's influence**

Reference to Vygotsky and his ideas is numerous<sup>iv</sup> enough that the following brief review describes recent articles or books, which draw on Vygotsky's ideas about learning and development in an overt and extended way. Most of the works in this chapter are by researchers who work within the classroom and use classroom data for their investigations. So, while this

review is by no means exhaustive, it is designed to show the depth and breadth of Vygotsky's influence on educational research.

Vygotsky's ideas about learning and development have influenced researchers in the field of math (Albert, 2000; Cobb, Wood, & Yackel, 1993; Forman & Larreamendy-Joerns, 1998; Forman & McPhail, 1993; Radford, 2000; Schmittau, 2003, 2004), history (Haenan, Schrijnemakers, & Stufkens, 2003), second language learning (Donato, 2000; Gibbons, 2003; Gutiérrez, Baquedano-Lopez, & Tejeda, 1999; Kwon & Kellogg, 2005; Lantolf, 2003; Lantolf & Appel, 1994; Lantolf & Thorne, 2005) and science (Giest & Lompscher, 2003; Howe, 1996; Inagaki & Hatano, 1991; Panofsky et al., 1990). Each of these content areas in schooling has used Vygotsky's ideas to explore how learning and development occur in these fields. In today's English language classrooms, Vygotsky's ideas about development have been aligned with genre theory in writing (Cope & Kalantzis, 1993; Martin, 1999), adolescent literacy development (Halliday, 1996; Hasan, 1996; Hicks, 1995-1996; Kucan & Beck, 1997), and work in English language formats (Forman & Cazden, 1994; Lee, 2000, 2006; Miller, 2003). The research that has come from many of these works, Forman, Donato, and Hatano for example, has been used to continue a Vygotskian tradition in education. While some have questioned whether some of these researchers are *true* to Vygotsky's intended meaning, (Langford, 2005), Vygotsky's influence on educational theory and ideas about learning and development continues.

### **2.3.2 Spontaneous and Scientific concepts in education**

The following section deals with studies which focus on concept development and the adolescent or post-adolescent period, though many exceptional studies have been done with a pre-adolescent focus (Clay & Cazden, 1990; Gallimore & Tharp, 1990; Tharp & Gallimore, 1988).

Each of the studies in this section highlights characteristics of scientific concepts or necessary components for the development of scientific concepts.

Panofsky, John-Steiner and Blackwell (1990) focused their ethnographic study on the development of scientific concepts with classroom discourse in a rural Navajo science class. In this study, the researchers asked fifth graders on the cusp of adolescence, to do two experimental activities: a concept sorting task and a film-retelling task. In the sorting task, students were asked to place animal and vegetable cards in groups that belonged together. The researchers found that while the students may not have placed the cards with groups in what a science teacher would consider the correct taxonomic groupings, the students were able to group the cards with categories that made sense to the students. For example, “they swim” or “they all go without legs” were categories the children developed to group the cards.

In the film-retelling task, students were asked to retell a film about eyes and their retelling of the structural and functional differences of eyes were classified as taxonomic. The retold information about particular animals was classified as script information. Children who used taxonomic classifications had responses that were longer in length and broader in depth of recall according to the researchers. The researchers concluded that children who grouped information into consistent and powerful categories (i.e. taxonomic) tended to do better on these tasks.

The researchers linked the categories the children came up with, “they swim” for example, to be evidence of spontaneous concepts. The authors further postulated whether these spontaneous concepts aided children in developing the scientific concepts the researchers said the more advanced children displayed, but felt they had insufficient data to make this claim. One critical piece that was missing from this paper about scientific concept development was whether

the more advanced children could consciously use the concept in novel situations, which Vygotsky (1987) claimed to be integral to scientific concepts.

This interrelationship between the everyday and scientific concepts as posited by Vygotsky and explored by Panofsky et al, was the focus of a review paper done by Howe (1996). Howe took the position that Vygotsky viewed everyday concepts and scientific concepts as a dialectic, which she compared to Piaget's stance on concept development. Scientific concept development, the author argued, was mediated by already developed everyday concepts and this stance was supported by a review of a number of studies from mathematics and science. Howe stated that one of the main keys for these research studies was that the teacher was not only able to help guide the students to master the vocabulary of the specific discipline, but that the teacher was able to help the students apply the knowledge to novel situations. This self-regulation and conscious use of concepts was key for Vygotsky's theorizing about the development and distinguishing nature of scientific concepts.

These two studies highlight characteristics and necessities in the development of scientific concepts. Both studies take the position that schooling is where scientific concepts develop. Both studies also show how mediation from an adult was vital to scientific concept development. These two necessities, schooling and adult mediation, were necessary components for the development of scientific concepts in Vygotsky's theory. The Panofsky study showed the complex relationships within a word, or scientific concept and showed students actually abstracting the concept, which are two characteristics of the development of scientific concepts.

### **2.3.2.1 Scientific concepts in other language settings**

Scientific concepts were investigated in a bilingual science classroom in a Hampton and Rodriquez (2001) article where a dynamic relationship between L1 and L2 learning and its



possible effect on learning was detailed. The researchers in this study used the standard of *inquiry* set out by the *National Science Education Standards*, which includes asking questions, using tools and planning appropriate investigations to help gather data, to examine whether the use of a bilingual inquiry approach would help the students develop valued scientific concepts for the classroom. The researchers provided a Likert attitude survey to the students and examined over 300 pieces of written data about the students' conceptual understanding as observed by the teachers and interns in the program. The authors made the general conclusion that inquiry, whether done in Spanish or English, was a successful way of helping bilingual students develop school valued scientific concepts.

Whether the process of concept formation was affected by culturally valued tools within the context of a specific milieu was the focus of a study done by Lima (1998). For Lima, the milieu was a Tikuna classroom in the Amazon, and Lima showed how the introduction of culturally valued and specific tools, in this case drawings, helped to mediate concept formation for bilingual Tikuna lay teachers. Through a comparison of pre and post data (i.e. written journals and hand drawn children's books) Lima made the argument that successful educational experiences relied on a pedagogy which valued and implemented culturally valued tools to help mediate the development of scientific concepts valued in schooling. Lima, similar to the Panofsky et al. article, argued that seeing the relationship between the development of scientific concepts and spontaneous concepts as dichotomous hinders education because tools, which could aid in scientific concept development, may initially reside in the everyday experience of the culture, and therefore, should not be overlooked when considering concept development and learning.

### **2.3.2.2 Scientific concepts in Math and History**

In a book chapter designed to examine the difference between viewing Vygotsky's ideas as constructivist or cultural-historical in nature, Schmittau (2003) examined how mathematical concepts, which are almost all scientific or true concepts according to the author (p. 226), required the teacher to constantly present math concepts that were just beyond the scope of what the students understood. In other words, the teacher was required to develop math learning in the zone of proximal development, so the students could develop math concepts that were generalizable and portable for the students. For Schmittau, the student "must be subjected to genetic and psychological analyses and pedagogically mediated" (p. 243). The student cannot construct scientific concepts like multiplication on her own by doing worksheets and memorization of tables. The student's actual developmental level must be analyzed and understood by the teacher, Schmittau (2003) argued, and then the teacher must teach to the concepts, which are just beyond the students' understanding, so that the student can develop and appropriate the concept for their own use. This mediation by the teacher and recognition of the developing nature of concepts based in the individual are both in line with Vygotsky's (1987) ideas about scientific concept development.

Understanding the actual developmental level of students was important for a study done by Haenen, Schrijnemakers, and Stufkens (2003) as well. These authors argued that educators must first take into account the actual developmental level, or their prior knowledge of a subject, in order for Vygotsky's ideas about scientific concept development to be fruitful. Haenen et al. used Galperin's model of the formation of mental actions, which is an explicit framework for working with in the ZPD, to assess how students developed the author's admitted ill-defined concepts of history. The starting point for the mental action model was defined by understanding

the students' prior knowledge, and ended with conceptual understanding shown by diagram representations of the concepts being developed and an appropriation via individual students sharing what they have learned with others. The authors, similar to Schmittau above, argued that educators work to understand the actual developmental level of their students, so that educators can build upon this level towards a more complex understanding of concepts valued in the history classroom.

Each of the above studies or reviews posited scientific concepts as vital to students and teachers if they are to succeed at learning and development in school. Each paper viewed examinations of teacher and student talk as vital tools to show conceptual change or development. Each study also situated itself with a direct link to Vygotsky, or to researchers and theoreticians who have developed frameworks directly based within a Vygotskian framework. While not based directly in Vygotsky, the work of M.A.K. Halliday and other systemic functional linguists have also found Vygotsky's ideas useful to their research.

### **2.3.3 Systemic Functional Linguistics and Vygotsky**

Systemic functional linguists have found a strong foundation in Vygotsky's work because both rely heavily on the context of culture for their work and ideas. Systemic functional linguists have used Vygotskian ideas about higher mental functions (Hasan, 1999; Rose, 1999), imagination (Cloran, 1999), intellectualization (Hasan, 1996), semiotic mediation (Butt, 2004; Gibbons, 2003; Hasan, 1992; Schleppegrell, 2004) and the ZPD (Martin, 1999; Williams, 1999) to help inform their work on schooling and development. This list is not meant to be exhaustive but is to establish the historical relationship that exists between the work of SFL and Vygotsky. Two

researchers, however, who wrote explicitly about the complimentary nature of Halliday and Vygotsky's work were Wells (1994) and Foley (1991).

Wells, in a now often quoted article, explored many aspects of Vygotsky and Halliday's work that he felt were well aligned. Wells went to lengths to examine the relationship between Vygotsky and Halliday's thinking about inner speech, ontogenetic development, and the role of language in intellectual development. Wells most interesting comparison, as it relates to this study, was between Vygotsky's theory of spontaneous and scientific concepts and Halliday's theory of commonsense and educated knowledge (Schleppegrell, 2004 made this link as well). Vygotsky's framing of spontaneous and scientific concepts has been explored here, and Halliday's relevance to Vygotsky's ideas, Wells noted, was the "progressive reconstructions of the grammar as a whole, each of which involves a new way of construing experience" (p. 68). For Halliday, Wells (1994) wrote, the child develops various linguistic choices beginning with using language to classify as a way of generalizing experience, but as the child interacts with adults, the child begins to understand that language use constructs meaning for both the child and adult. Meaning making becomes a two way process as adults take on the role of *teacher* just as the children take on the role of *student*, which helps the child develop their commonsense (spontaneous) grammars developed outside of schooling.

The next phase in a child's development, Wells (1994) wrote, was when the child made the transition to schooling. For Halliday, this was the time when language began to be used as a tool, and children began to learn to "reconstruct their grammars to cope with the abstractions involved in the use of grammatical metaphor and to recognize and exploit the synoptic/dynamic complementarity" (p. 69). For Halliday, similar to Vygotsky, schooling was where children developed an ability to move from the general to the abstract. This use of abstract language, or

educated knowledge, was akin to Vygotsky's framing of scientific concepts as the ability to abstract concepts. And for Halliday, the development of grammatical metaphor, i.e. nominalization, in writing was a key to this type of abstract thinking. Grammatical metaphor, Wells noted, is a tool students use as they begin to develop the educated knowledge valued in schooling. Wells (1994) even raised the nominalizations *exploitation* and *revolution* Vygotsky used in Chapter 6 of *Thinking and Speech* to surmise whether Vygotsky might have come to understand nominalizations as a form of higher thought (p. 71-72).

Vygotsky, Halliday and Basil Bernstein were the subjects of Foley's (1991) article, and while much less detailed than Wells' article, Foley still provided a clear way of seeing how the work of Vygotsky and Halliday, along with Bernstein, can be used together. Foley, similar to Wells, acknowledged that both Halliday and Vygotsky saw "the language of technicality and abstraction" (p. 32) as vital for students to use if they want to be successful in schooling. Schooling, Foley wrote, was the place where thinking and language use became detached from the immediate and everyday experience of the child, and became disciplined and self-controlled. And because language is the vehicle for learning, Foley noted, it becomes vital for researchers to understand how the role of language mediates this learning, and for Foley and Wells, Halliday and Vygotsky are an excellent compliment to this end.

### **2.3.3.1 Semiotic Mediation**

Perhaps the clearest link between Vygotsky and Halliday are their similar notions of the roles language plays in ontogenetic development. As was noted in the introduction, for Vygotsky, language semiotizes (Halliday, 2003) the content of our thinking (Vygotsky, 1998) as it simultaneously mediates a person's understanding and development within the culture. The language and culture therefore are material, historical products; in other words, they are a

dialectic co-constructed, determined and shaped simultaneously. Hasan (2005) summarized the complimentary aspects of Halliday and Vygotsky well.

Vygotsky contributes to the understanding of our mental life by revealing its deep connection to semiosis; in so doing he anticipates the literature on the dialectic of language and mind: it is this dialectic that is responsible for their co-evolution in the human species. Halliday contributes to the understanding of our semiotic life by revealing its deep connection with society; in so doing, he elaborates on the dialectic of language and society which underlies their co-genesis. (p. 156)

Language is where thoughts are born, while this language marks, connects and creates our stance in society. The dialectic relationship and language as semiotic for both Halliday and Vygotsky help to make Halliday's tools of SFL useful for examining Vygotsky's ideas about scientific concepts. For Halliday, language choice, realized in lexical and grammatical choices, is part of a dialectical relationship with situation. Each, situation and language, are determined and shaped by each other simultaneously and realized in register and we can examine the choices via his system of viewing language both at the discourse-semantic level, and the lexical-grammatical level.

### **2.3.3.2 Register**

A register is the grammatical and lexical features which are included in distinct uses of language (Halliday, 2003; Schleppegrell, 2001), and research involving register within school settings, or academic register, has been extensive (Christie, 1993, 1999, 2002a; Gibbons, 2003, 2004; Macken & Slade, 1993; Martin, 1999; Schleppegrell, 2001, 2004). This research has shown

“certain lexical and grammatical features are functional for ‘doing schooling’” (Schleppegrell, 2001, p. 432) and these features are represented by an academic register.

An academic register does not have many congruent language features and has more incongruent language features (Achugar & Colombi, 2007), for example. Congruent language choices are highly personal, use colloquial language, have high modality usage, and may use more clauses to make meaning. Incongruent language is impersonal, uses more technical vocabulary, has low modality usage, and is lexically dense. This development from congruent, oral, interpersonal registers towards incongruent, written academic registers is indicative of development from everyday, spontaneous concepts to academic, scientific concepts (Gibbons, 2003). This type of development, I argue, occurs within an academic register with many different types of features which could be analyzed: grammatical metaphor (e.g. nominalization), lexical density, clause combining strategies, or meta-discourse selections representing interpersonal stance (e.g., modality, appraisal, attitude) (Christie, 2002a; Halliday, 2003; Schleppegrell, 2004).

Within the various academic registers of schooling, scientific school valued concepts are developed. These academic registers, as the above literature shows, are a part of schooling and are used by teachers and with students during instruction. Instruction within schooling was the key difference for Vygotsky between the development of spontaneous concepts and scientific concepts. Thus, the development of scientific concepts occurs as a part of the development of an academic register. Some of the work bringing academic register and Vygotsky’s ideas together is reviewed below.

### **2.3.3.3 SFL studies and Vygotsky**

Gibbons (2003) brought Vygotsky’s idea of mediation together with SFL’s work on mode continuum (i.e. written or oral) to consider how teacher-student talk in a science class affected

L2 learners' language development. The author examined classroom discourse that facilitated language development in students in this content-based science class. The author argued that *mode*, whether a text is oral or written, was a useful way to examine the language of the classroom; but instead of viewing the relationship as dichotomous, the author argued that as the talk between the teacher and students became discipline acceptable, it began to resemble written talk and thus the talk could be seen as moving along a *continuum*. Written school or academic language is considered by SFL, among other things, as being very lexical dense with grammatical metaphor usage, which are both highly indicative of an academic register. The author went on to argue that a focus on the language of the classroom as a mediator of valued knowledge in the science class was beneficial to both teaching and student learning. The explicit focus on the academic register that was being constructed in the classroom aided the students understanding of the valued concepts in this science class.

Butt (2004) also focused on language use in the classroom, but chose to focus on the change that occurred with the language use, or our meaning potential (Halliday, 2003), as students moved between primary and secondary education. The author likened this transition to secondary school to an apprenticing position, and used classroom discourse to exemplify his points. This move, between these two social situations, was considered by Butt as the place where students developed the need for using language in more abstract ways. The meaning making these burgeoning secondary students were required to make mandated that the language they use be less grounded in their immediate experiences and portable to abstract uses of language. Language, he argued, became a tool to understand and abstract the principles demanded in secondary schooling. Adolescents in secondary school are required to use incongruent, abstract language. The author noted that Bruner called this "critical abstraction" and



allowed the language user to apply their language to novel situations. Butt also wrote that language use at this time in adolescence allows the language user, in school and with teacher guidance, to build different orders of complexity to concepts or words that they are developing. Language users then, similar to the development of Vygotsky's scientific concepts, begin to deploy abstract language in new situations, which are further removed from their everyday and concrete experience.

And while Christie (2002b) does not reference Vygotsky in her book chapter, it is worth relating the shared characteristics between her ideas situated with SFL and Vygotsky's ideas. Christie's chapter focused on the idea that advanced literacy was literacy, which occurred in the secondary years. Advanced literacy, as a concept, has roots in Halliday's ideas about language and has a number of factors, which could be directly aligned with Vygotsky's ideas on scientific concept development. Christie focused advanced literacy on the idea that the grammar the students used to help them become better writers at this advanced stage was a grammar that allowed the writer "to handle the building of generalization, abstraction, argument, and reflection" (p. 46). All of these aspects of advanced writing literacy were in line with Vygotsky's idea about scientific concepts, which necessitated that the child be able to apply the concept to problem solving in abstract ways, and to be able to generalize from the concept. The idea of reflection goes directly to the ability of the student to self-regulate or to be consciously aware of the concepts linkages to other concepts. Christie also wrote that advanced literacy was demonstrated when students could use language in ways which showed abstraction away from their immediate and everyday experience, and when students built generalizations and arguments about various aspects of life. Students, in other words, demonstrated that they had developed scientific concepts that were valued in the ELA classes Christie examined. I chose to highlight

this paper because much of what Christie argued for as advanced literacy, from an SFL perspective, has many shared characteristics of scientific concepts that one would like to see in an ELA classroom.

As these studies indicate, student success in using an academic register depends on the conscious understanding of valued language within schooling and its deliberate use within novel settings, or across settings. These characteristics, volition, abstraction, and differentiation, are also characteristics of the development of scientific concepts. It should come as no surprise then to write that the development of academic register occurs as part of the development of scientific concepts.

## **2.4 SCIENTIFIC CONCEPTS AND ENGLISH LANGUAGE ARTS**

This final section reviews the work in the English Language Arts that has dealt directly with the development of scientific concepts. In ELA specifically, Vygotsky's ideas have been linked to whole language learning (Goodman & Goodman, 1990), a reading tutorial program entitled Reading Recovery (Clay & Cazden, 1990), and writing and writing processes (Dyson, 2003; McLane, 1990; McNamee, 1990; Warwick & Maloch, 2003), but each of these studies focused on pre-adolescent literacy development. Specific research into scientific concept development in the English Language Arts at the secondary level is lacking.

There have been two significant exceptions. The first was a book section written by Cope and Kalantzis (1993) on genre literacy, and the second exception is the work of researcher/teacher Carol Lee and her Cultural Modeling Project (CMP), which as a body of work relies heavily on Vygotsky's ideas about the development of scientific concepts.

Cope and Kalantzis (1993) situated Vygotsky's ideas about spontaneous and scientific concepts as integral for genre literacy. For the authors, genre literacy, the focus on specific word function and varying grammatical constructs within the multiple genres of writing, was effective as an approach only if the understandings of the functions of written language were portable and could be abstracted to other genres. These characteristics, abstract and portable, were argued to be in line with Vygotsky's writings about scientific concepts. If genre literacy were just about imitation, the authors argued, then genre literacy would not be developing scientific conceptual understanding of writing with students. Instead, genre literacy would be operating at the level of a pseudo concept because imitating a genre of writing is not an act of abstraction. Using and understanding of words' "deliberate structuring of the web of meaning" (p. 71) and making conscious and deliberate choices within the system of grammar (Halliday, 2002) were seen as deliberate and abstract uses of writing. And these abstract and portable uses of writing developed within genre literacy were characteristics of the scientific concepts Vygotsky wrote about. In other words, to teach *genre literacy* in school, and to know *genre literacy* as an image in all its complexity, or as a scientific concept, was to understand the webs of meaning which connected them to the term *genre literacy*. The words used, the grammar chosen, the format structures of any given genre of writing, were not to be seen as concrete structures, but as abstract and portable to novel genres. The teaching of genre literacy in schooling was about "using a knowledge of genre and grammar to find one's own voice, not within genres, but across, between and around genres" (p. 89). Genre literacy has a multitude of determinations and its very formation relies on Vygotsky's ideas about the form and function of scientific concepts. Moving from home to school valued genres of knowing were what much of the work Carol Lee and her

Cultural Modeling Project (CMP) have been about and her work marks the second exception to work in English Language Arts and scientific concepts.

This next section will use two articles by Lee (2000, 2006) to situate her work with CMP as a collective body of work influenced by Vygotsky's ideas about scientific concepts. These two articles were chosen as they are the most recent and up to date articles about her work with CMP, they directly developed ideas based in an understanding of scientific concepts and they were situated within secondary ELA classrooms.

The Cultural Modeling Project focuses on the development of academic subject specific reading and writing which uses African American English and tools within African American youth culture to further academic development (Lee, 2006). A discussion of CMP as a research project could involve discussion of the various methodologies Lee has used (i.e. ethnography of communication) or its application as a framework in computer mediated learning environments (Lee, 2003), but I focus on CMP's direct ties to Vygotsky's ideas about scientific concepts.

A large part of CMP's development takes the point of view that the home or "informal intuitive process" (Lee, 2006, p. 313) of knowledge, which African American students bring with them to schooling, can be used in school instruction to assist students development in more school valued "subject-matter-specific modes of reasoning and problem solving processes" (p. 310).

Lee (2000) related the idea that *signifying*, speaking with innuendo and double meanings and playing with the sound of the language within African American culture, could be used as a tool to bridge *spontaneous* and *scientific* concepts. Signifying, Lee argued, was neither solely *spontaneous* nor *scientific* as a concept, and therefore was useful as a bridge between the two types of concepts. Signifying, Lee (2000) wrote, was used systematically, consciously, and

intentionally, which are characteristics of scientific concepts. Yet despite this volition, the concrete nature of the signifying utterances made the rules of interpretation and application to novel situations (two other characteristics of scientific concepts) difficult. Lee wanted the students to abstract and to apply the rules of interpretation in signifying to school valued literary tropes. The abstraction of the complex understandings of signifying to the equally complex understandings of literary tropes in schooling was why, Lee argued, signifying could not be considered a *scientific concept* the students could exploit in a school setting.

To cross from signifying, as a spontaneous concept to the literary scientific concepts of “irony, metaphor, symbolism and the various rhetorical tropes” (Lee, 2000, p. 196) valued in schooling, a teacher had to deconstruct the already held concept of signifying and make explicit links to school valued concepts. This link, the author wrote, to the school valued scientific concepts of irony, metaphor or symbolism aided these students understanding of these school valued concepts. And while the metaphor of bridge, used by Lee, suggests a chasm between spontaneous concepts and scientific concepts, when Vygotsky (1987) saw their interaction as dynamic and therefore was a poor word choice, it seems that making an explicit link from spontaneous concepts and actual developmental levels could be useful in developing school valued scientific concepts. For example, when Lee marked signifying and hip-hop music as tools to be used in the development of scientific concepts.

Lee (2006) argued that hip-hop songs did much the same thing as signifying. Within CMP, using culturally relevant tools was critical to working with and having success with students in school. Understanding many hip-hop songs, Lee explained, required the students to understand metaphor and symbolism as concepts. These concepts though are spontaneous because the students could not abstract them and apply them to novel situations, in this case

understanding canonical literature. Working with the teacher the students were able to see how their understanding of a hip-hop song by *The Fugees*, with its symbolism and metaphor, could be used and abstracted to aid them in understanding the symbolism and metaphor within a novel by Toni Morrison. Lee (2006) argued, similar to Lima (1998) and her 2000 piece on signifying, that this move from understanding a culturally relevant item to understanding a school valued item was evidence of a bridge from spontaneous to scientific concepts.

## 2.5 CONCLUSION

Lee's work has been helpful in understanding how students can develop scientific concepts in schooling. But this is but a small part of her overall work within CMP, and leaves much work to be done if we want to better understand how teacher and students talk mediates the development of scientific concepts within the English Language Arts. This study's focus on development of scientific concepts using the tools of SFL fills in some of this understanding.

This chapter focused on research into concept development in general and examined previous research involving Vygotsky, scientific concepts, and academic register specifically. And this chapter examined why using Vygotsky's ideas about the psychology of learning with the tools of SFL is complementary to an examination of the development of scientific concepts. A specific focus of the development of scientific concepts, based on Vygotsky's ideas, in a secondary ELA classroom using the harmonizing theory of SFL has yet to be done, though such a study is outlined in the following section.

### **3.0 METHODOLOGY**

In this study, I analyze the concept of summary that was presented during one curricular unit within one ELA secondary classroom. The analysis examines the interactions between one teacher and two students as they work to develop understandings of summary. The concept of summary for this class was a part of a book review assignment.

The questions that motivate this study of the development of the ELA concept of summary during the unit of study are:

1. Does scientific concept development occur in this unit?
2. How does the students' talk demonstrate the dynamic interplay between spontaneous and scientific concepts?
3. How does the teacher's talk support the transformation of spontaneous concepts to scientific concepts development in two students?
4. What evidence do the two students present to indicate that they have developed (e.g. complexity, etc.) the valued scientific concept(s)?

### **3.1 DATA**

The data collection and analysis using classroom discourse and interviews from two students and the teacher were bound by one ELA curricular unit. The curricular unit, or one type

of school macrogenre (Christie, 2002a), is a semi-definite time period, where one or more ELA concepts (e.g., the persuasive essay or the research report) and their attending complexity are the focus of daily instruction. This curricular unit was the boundary of the data collection. The occurrence of the curricular unit over time and within a physical setting allowed me to better understand the nature of development over time. “We must be bold enough to view the relatively ‘big sweep’ of classroom talk that typically characterizes a unit of curriculum activity” (Christie, 2002a, p. 99), if we are going to better understand the nature of teaching and learning.

### **3.1.1 Macrogenre**

The macrogenre of a curricular unit has a beginning, middle, and end, and the macrogenre is bound both by time and content. For example, an ELA teacher may want to focus on the persuasive essay. The duration of the unit, generally four to six weeks, is the time it takes to introduce the concept of *persuasive essay* and work on this concept’s complex connections. This type of unit is what Christie (2002a) called a macrogenre.

There are three parts to this macrogenre of curricular unit. The first part of the genre takes place over a series of lessons, which initially sets out the goals of the unit. These goals set out the tasks and an overall framework for working towards the end of the unit, where generally a student completes one or more tasks central to the unit’s goals. For example, the first parts of the unit might define a persuasive essay and identify its components.

The middle of the unit is where the teacher’s nuanced work with the students generally takes place (Christie, 2002a). Because this work is generally recursive in nature, it requires a conscious guiding and pacing by the teacher to assess and to adjust to the feedback being given by students, in order to satisfy the initially established unit goals. The pacing and the amount of



instruction based on feedback from the students are contingent on the larger objectives the school desires and the degree of flexibility given to each instructor to reach school, district, state and federal goals.

In the final part of the unit, the student's ability to work independently is assessed. In the case of a unit on the persuasive essay, the students might write a completed essay. This essay would be used to judge whether the complex components, which make up the concept of the persuasive essay (i.e. a thesis, transitions, conventions of usage) are present. The components would also have to reflect the teacher's discretionary adjustments to the unit's goals.

### **3.1.2 Description of site**

The data was gathered from one 12<sup>th</sup> grade British Literature class that was an English College Preparation course at Sherman Area High School (pseudonym) in Southwestern Pennsylvania not far from the West Virginia border. At the time of the study, the school had 628 students, 40% whom were on free or reduced lunch, and had a graduation rate of 80%. The school was 87% white and 13% African-American. The high school's Adequate Yearly Progress report, a part of No Child Left Behind, was listed as "making progress," though the district itself met AYP for 2005, the most recent reporting year.

The school was located in an economically depressed part of the state and was situated on one of the three major rivers that course through Western Pennsylvania. The town in which the school was located had a population of 3,000, which had in the past relied on coal related jobs and steel processing plants for their livelihood. The average income was \$28,000 dollars per year, and the state average was \$41,000 dollars per year at the time of the study. The town recently demonstrated its economic capital by releasing all of the city workers except for one

police officer. The downtown portion of the city was dotted with boarded up brick buildings and semi-functioning neon signage advertising job counseling, and insurance offices.

### **3.1.3 Participants**

The participants of this study were the teacher and three focus students. The teacher had worked for fifteen years in this locale, and was initially recommended by a faculty member at the University of Pittsburgh. This faculty member indicated to me that the teacher wanted to participate in research into her classroom. The teacher was dedicated to her school and to the students. In recognition for her teaching and service, the teacher was assigned honors and upper level English classes. She refused, however, to teach only honors and upper division courses. Rather, she insisted on continuing to teach students who were not college bound, or considered remedial by the school.

The three participants were from the teacher's British Literature English class. I audio-taped and transcribed three student interviews, and I collected the three versions of the concept map as well. I chose to analyze two students' materials because the third student was generally unresponsive in two of the three interviews done.

## **3.2 DATA SOURCES**

An examination of the development of scientific concepts necessitates multiple data sources examined over time because development is about change over time. The talk, interactions, and

products from various class periods are examined to gauge whether there is change over time in the student's use and understanding of the chosen school valued scientific concept of summary. The following sections explain the data sets and points of analysis for this study.

### **3.2.1 Classroom talk**

I audio-taped both the teacher and two students to capture teacher talk and student interactions daily for eleven class periods. Researchers (Brown, 1992; Kuhn, Amsel, & O'Laughlin, 1988; Seymour & Lehrer, 2006; Siegler, 2006; Stevens et al., 2005) argue that this type of design, where students "are observed over a relatively short period of time (day, weeks) as they acquire a certain form of understanding" (Brown, 1992, p. 156) is an important tool researchers can use to examine students' learning and development. The focal students were seated together and the camera and microphone was placed to catch both teacher/student and focal student/student interactions.

An observation template (Appendix C) was used as field notes to supplement the video recordings. How these recordings were analyzed is discussed later in the chapter. The audio-tapes were transcribed. Only "the academic, or 'instrumental' (Bernstein, 1973)" (Mehan, 1982, p. 66) classroom talk and interaction were transcribed. This talk is part of what Mehan (1982) referred to as the heart of the lesson where "the bulk of academic information is exchanged between teachers and students" (p. 68) Thus, talk of attendance, discipline, or non-focus concept talk whether academic, or what Mehan called "procedural" (p. 66) talk was left out of the transcription.

### 3.2.2 Interviews

The students and teacher were interviewed and audio taped three times over the course of the unit (Seymour & Lehrer, 2006; Shulman & Quinlan, 1996; Stevens *et al.*, 2005). The interviews occurred at the beginning, middle, and end of the macrogenre of the curricular unit and were semi-structured interviews (Grindsted, 2004). The semi-structured format allowed the same questions to be asked across each interview.

The teacher was interviewed in detail at the beginning to understand her expressed goals for the unit, to understand the concepts she thought were important for the students to learn, what her past experience had lead her to believe would be important (see Appendix D.4) and to try to understand the competing and hierarchical structuring of the concepts with in the unit.

The two focal students were interviewed three times over the course of the unit. The purpose of the first interview was to determine how they understood the concept of summary (Haenan et al., 2003). The second interview was to determine what they understood about the concept of summary as it was developing. The final interview was to uncover the students' understanding of the valued concept of summary that was presented to them over the course of the unit. The final interview was designed based on interviews by Brown (1992; Campoine & Brown, 1990) to determine the degree to which the students could demonstrate self-regulation of the concept(s) presented (see Appendix A).

After the third interview, I asked them to demonstrate use of the concept by reading an essay and responding to a written prompt. The prompt asked the students to summarize the essay and to agree or disagree with the main idea in the essay. These student interviews and independent final summary task highlighted the degree to which the students could abstract the focus concept to a novel situation. These interviews show the web of relationships and

complexity the students were attributing to the focus concept. And the interviews were designed to see to what degree the students generalized to other concepts and context without assistance.

### **3.2.3 Visual representations within the interview**

Similar to Lima (1998) and Haenen et al. (2003), graphic representations that the teacher and students drew to signify the scientific concepts served as another data source. At initial interviews, the interviewees were asked to draw a map of the concept of summary. The map type was of their choosing, but represented the bubble map in Appendix B. At each subsequent interview, the map was presented again and the interviewee was asked if they would have liked to (a) modify the map in any way; (b) keep the map the same; (c) redo the entire map. Each of the three times the map was worked on the interviewee had a different colored pen, so that changes could be attributed to a specific interview. This concept map helped show “a real concept as an image of an objective thing in its complexity” (Vygotsky, 1997, p. 53). This map allowed the students autonomy in their drawing of scientific concept, which highlighted the degree to which they could voluntarily use the concept, and to what degree they could compare and differentiate the concept from other concepts.

### **3.2.4 Material evidence of a concept’s development**

The final summary task was an instantiation of a concept of summary produced by the student. Characteristics of a scientific concept include whether the concept is generalizable and can be used deliberately (Vygotsky, 1997). The final product is an indication of both of these characteristics. Evidence of the generalizability of the concept was partially determined on the

basis of the students' ability to employ the concept of summary. The concept was used deliberately in as much as the students did not need to speak to me about the concept of summary to write a response to the prompt, thus they intentionally applied their understanding of summary as a concept.

### **3.2.5 Verbal protocols as sites of development**

All the interviews and graphic representations should also be understood as contributing to the development of the concepts examined (Smagorinsky, 1998). The interviews highlighted the topic for investigation and thus, affected the teacher and student as they worked to develop certain concepts in the ELA classroom. As Wertsch (1985) included in his definition of *situation definition*, my role as a researcher affected how I represented and defined the topic of the interviews. I take the point of view that my interactions with the participants were *part of* their development of scientific concepts because our interactions were mediated by the concept of summary. These interviews, similar to the discourse of the classroom, played a role in the development of the concept, since both situations were “central moment[s] in concept formation” because we were “[specifically using] words as functional ‘tools’ (Vygotsky, 1997, p. 107).

## **3.3 DATA ANALYSIS EXAMPLES**

Discourse analysis as an analytical tool (Cazden, 2001; Christie, 2002a; Gee & Green, 1998; Mehan, 1984; Rogers, Malancharuvil-Berkes, Mosley, Hui, & O'Garro-Joseph, 2005; Schleppegrell, 2004) has long been a part of investigating occurrences of learning in the

classroom. Through discourse analysis, I traced the concept's development as it occurs in real time (Smagorinsky, 1998) across oral and written discourse. Discourse analysis is one tool that allowed me to examine concepts as “an image of an objective thing in its complexity ... [with] all its connect and relation ... synthesized in a word” (Vygotsky, 1997, p. 107) because language is the primary tool that we use to mediate our reality. Thus, using tools to examine language helps us examine thoughts, which are born through words (Vygotsky, 1987).

### **3.3.1 Systemic Functional Linguistics: Coding data**

I analyzed the classroom discourse and interviews using a Systemic Functional Linguistic (SFL) approach. SFL, as the literature review showed, has been used to better understand the language of the classroom and schooling (Christie, 2002a; Derewianka, 2003; Gibbons, 2003; Hasan, 1992; Martin, 1999; Mohan & Beckett, 2003; Schleppegrell, 2001, 2004; Schleppegrell & Colombi, 2002). Because concepts are concrete images in all their complexity embodied in a word, I examined how the concept developed through discursive interactions. Using Halliday's notion of meaning making, and talk as text (Christie, 2002a; Schleppegrell, 2004), I traced the development of a concept in words, clauses, and textual evidence. The purpose of this analysis was to develop an understanding of how the student understood the concept or where in the developing process the student was, in regards to the concept. In the next section, I expand on this analytical framework and provide an illustration of the analysis.

### 3.3.2 Coding the development of scientific concepts in talk

Scientific concept development, as was shown in the literature review, can be examined by tracking the student's movement from congruent, everyday language to more incongruent, abstract, academic language. SFL views language as a meaning making resource rather than as a set of rules. This view allows us to understand language not as correct, or incorrect, but as more or less appropriate depending on the context of use. For example, what is being talked about, with whom, and how will change from context to context. The register choices a person makes will be realized in her language choices, and will vary depending on the context.

The register of a text “is characterized by three features: what is being talked about (field), the relationship between the speakers or writer and reader (tenor), and whether the language is spoken or written (mode)” (Halliday & Hasan, 1985, in Gibbons, 2003, p. 251). A student will not write (mode) a persuasive essay about Bush's Iraq occupation (field) to her ELA teacher (tenor) the same way she will write a text message (mode) about her Friday night (field) to her friend (tenor). What is important to keep in mind about an SFL framing of register is that field, tenor, and mode are three ways of looking at the same text. These three features of register are simultaneous in their realization within any one text. Register is the relationship between the context and the language (see Figure 1).

Language, in SFL, is designed to fulfill three functions, or metafunctions (Eggins, 1994; Halliday, 2003): *Experiential*, how we relate experience, *interpersonal*, how we create relationships with others, and *textual*, how we organize information (see Figure 1). Register is critical in SFL because its three variables, field, tenor and mode, “are linked to the three types of meaning language is structured to make: the experiential, the textual and the interpersonal” (Eggins, 1994, p. 78), which is realized at the *discourse-semantic* level by features such as



lexical relations, conversational structure and conjunctions. The language is structured to make these three kinds of meaning and this structuring of meaning is reflected in the *lexico-grammar*, which is realized through *transitivity*, *mood*, and *theme*. Register, as the illustration below shows, is the relationship between context and language, and thus, the arrows should illustrate this by pointing in two directions: upwards and downwards. This language, as realized in register choices, we know from Vygotsky (1987) are where thoughts are born.

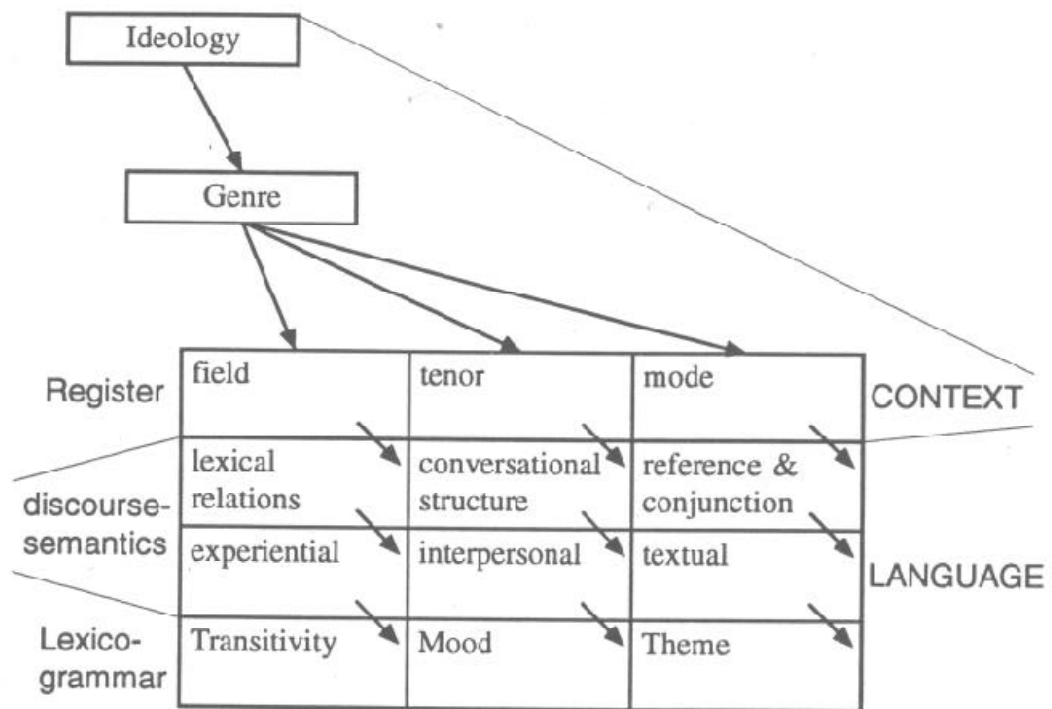


Figure 4.7 Lexico-grammar, discourse-semantics and context

Figure 1. Visual representation of the structure of language<sup>v</sup>

In the following sections, I provide examples of how I examine register choices within the texts I analyze.

### 3.3.3 Congruent to incongruent language

The purpose of this section is to provide a context, coding categories, and a basis for their analysis. I provide literature, which has examples of what is examined in chapter 4, the section on data analysis.

Gibbons (2003) argued that the *mode*, or the distinction between a spoken to written text, was not dichotomous in nature, but should have been seen as a continuum. The register movement along this continuum of spoken to written in schooling contexts has been shown in the work of Christie (2002a, 2002b), Schleppegrell (2004) and Bourne (2003) as movement from more congruent, oral registers to more incongruent, academic or “writtenlike” (Gibbons, 2003, p. 252) registers.

For example, Gibbons (2003) observed how in a Australian L2 classroom, scientific concepts about science move along this continuum as the students move from speaking in a small group with peers, to speaking with the teacher, to finally writing about what was being discussed. It was across these three situations where the students developed *towards* an incongruent, academic register. “The choices for mode reflect the different ways that a text is present and organized, related to the role that language plays in the realization of the context of situation” (Schleppegrell, 2004, p. 63). The tracking of choices made in register from the informal peer group to the final written product can illustrate the development of scientific concepts because scientific concepts are by definition abstract, and impersonal register choices of the language of schooling.

Gibbons (2003) illustrated the development of scientific concepts at the discourse-semantic level academic register and scientific concept development by showing how the

students' talk about magnets developed over time toward an academic register. This move to an academic register was indicated by how the students use the cohesive resource of reference.

The following student utterance said in small group work begins the analysis. "Look, it's making them move. Those didn't stick' (p. 252)." These utterances were personal, were highly concrete, contained two clauses, and used of exophoric referents. The exophoric *referents* "them" and "those" required the interlocutors to be physically present to recover their meanings from the immediate context. The text was presented and organized in an informal, and concrete manner. "Look" was highly personal because the imperative verb also needs the physical presence of an interlocutor to respond to the command.

Gibbons (2003) next example sentence showed movement towards an academic register. "We found out the pins stuck on the magnet' (p. 252)." This utterance from a student to a teacher presented and organized the text as impersonal and less concrete, which demonstrated a repackaging of the information in a formal and abstract way. The speakers had moved from two clauses, to one clause, and were beginning to relate the process of magnetic attraction by identifying the process using formal names, such as, pins and magnets. Additionally, the utterance had fewer clauses than the first example. The "we" was chosen by the student and said to the teacher, to refer to the students who were a part of the observation. The teacher was not present and, therefore, needed to have the message contextualized to interpret its meaning. A move to technical and *endophoric* register marked by the transformation of the pronoun "them" to the noun "pins" was also indicative of the academic register.

The last example of Gibbons (2003) using SFL to analyze movement along a continuum of written to spoken was a student's written report about the science experiment. One student wrote, "Our experiment showed that magnets attract some metals" (p. 252). The noun phrase

“Our experiment” was impersonal (i.e. the noun phrase signals a overarching category of experimentation rather than a specific activity in an isolated and temporal context), and the noun phrase also generalized across contexts contrasted to “we” or “Look, it’s moving,” which contained *referents* that required a specific context for their interpretation. The sentence is lexically dense and uses technical language. Gibbons argued that the movement from the language choices of the first example, to this last example was evidence of movement from spontaneous concepts to scientific concepts shown in the discourse choices of an academic language and register. This development from the congruent to the incongruent language choices was part of an academic register, and was also indicative that scientific concepts are developing and how this development was engendered by language. These choices can be viewed, then, not as static choices, but as choices within a larger system of text construction and register (discourse-semantic, textual, see Figure 1), which changes as context changes and experience, and learning occur. Thus, the discourse-semantic language choices that students make in structuring the text are not only representations of experience but also representations of changes in conceptual thinking. This approach is consistent with SFL, which maintains that meaning making is part of the grammatical and discourse-semantic system and that language choices are made based on one’s cognitive orientation in the task.

### **3.3.4 Transitivity**

“The transitivity system,” Halliday (1994) wrote, “construes the world of experience into a manageable set of PROCESS TYPES” (p. 106). These process types help us differentiate between the happenings around us that are internal and external. The external are realized by *material processes*, and the internal by *mental processes*. A third major process in SFL, is the

relational process where “we learn to generalize: to relate one fragment of experience to another” (p. 107). These processes represent our experience, and for this study, I am interested in what types of processes are used to represent the concept of summary. These processes make up our mental picture of reality (Halliday, 1994), and help us to make sense of our experiences. For concept development it is vital to be able to generalize from one concept to another or to relate one fragment of experience to another. This study examines the process types the teacher and students use in classroom and interview talk with the major focus being an examination of relational processes.

Relational processes set up a relationship between two separate units. For example, I can say “Mary is my sister,” which identifies Mary as a sibling. Or I can say, “He has long hair,” which sets up *he* as having, or possessing the hair. Halliday wrote that there are three main types of relational processes: (1) intensive; (2) circumstantial; and (3) possessive. For the development of the concept of summary I am concerned with what the concepts *has* or *possesses* as components to its make up. I am also concerned with how the teacher and students’ talk sets up intensive relational processes. What do they say summary *is*, or what do they attribute to or identify with the concept of summary. An analysis of transitivity enables us to understand the attributes of or what teacher and students equate summary to. This analysis helps to highlight the components and the web of logical relations of the concept of summary.

### **3.3.5 Clause linking as evidence of abstraction**

I examine language students use in organizing and structuring a text (discourse-semantic level) by examining how students choose to link clauses. Examining the logical connections students made among clauses during text construction highlighted the incremental transformation from an

informal register to the formal register of schooling. Schleppegrell (2001) and Butt (2004) both argued that a move towards abstract language includes the linguistic resources that students used to create logical connections between clauses (e.g., contractions, conjunctions, etc.). These logical connectors helped to elaborate, extend, or enhance meaning (Eggins, 1994); thus, they were analyzed as part of the developing web of relationships of a given scientific concept. The use of these connectors showed how a scientific concept evolved towards complex, academic and incongruent concepts.

For example, Schleppegrell (2001) compared two school-based texts to examine types of shifts students potentially made when developing academic registers. The first part of her text example showed a student using conjunctions to introduce clauses, “And, um, like sometimes, if, um, like” or to link ideas, “so you raise your hand” (p. 446). The author argued the use of “and,” “like,” and “so” to link to the previous discourse, to introduce an example, and to mark a cause, respectively, were typical of spoken, informal and congruent register choices. These choices differed from abstract and academic register choices presented below.

Schleppegrell (2001) highlighted these language choices in a text example. The text made logical connections without the use of conjunctions to mark relationships. Rather, the text was a complex construction that used restrictive adverbial clauses to signal causal relationships between the theme and rheme. For example, “The formation of sedimentary rocks is closely associated with water. One type forms when water carries soil, pebbles, and other particles to the ocean floor where these sediments become rock” (p. 447). This textual example was also conspicuously devoid of “so” or “and” to begin clauses, which presented casual explanations. For example, the use of “where” and “when” to embed clauses contributed to a hierarchical structuring of the text by specifically using language to mark a specific time and a specific place.

The use of embeddings created a conceptual hierarchy by subordinating place and time to the overarching theme of “the formation of sedimentary rocks.” Thus, this structuring of causal relationships was used to *enhance* and to *extend* (Eggins, 1994) the idea of “formation”, and creates the relationship between “where” and “when,” that was time and place. In other words, this specific type of sedimentary rock occurred at a specific time, “when the water carries,” in a specific place, “the ocean floor”.

The use of subordination builds a complex understanding of the idea of “formation of sedimentary rocks” in which relationships between elements of the concept became apparent in the language choices that students make. According to SFL, these language choices taken together are indicative of abstract and school valued language and can be used to trace the complex development of scientific concepts from spontaneous concepts based on language use in context.

### **3.3.6 Grammatical Metaphor**

Grammatical metaphors are incongruent forms or “metaphorical modes of expression” (Taverniers, 2006, p. 321). A metaphor is expressing one thing in terms of another and can be seen using Halliday’s (1994) example where, “a large number [of protests]” is expressed metaphorically by representing it as “a flood [of protests]” (p. 342). In contrast, grammatical metaphor implies representing the metaphor through a change in grammatical category. So, in Halliday’s example, an instance of grammatical metaphor might be “the protests flooded the square,” where a grammatical change occurs as *flood* changes from the subject noun position to the verb. The metaphor encodes meaning with a variation of grammatical choices to express

meaning. A common type of grammatical metaphor in SFL is shown in the process of nominalization.

Nominalization as a process can occur in a number of ways, but the simplest or one of the most frequent occurrences of nominalization is when verbs become noun phrases. For example, the congruent expression “water evaporates daily” becomes the metaphoric, or incongruent expression, “Evaporation occurs daily.” The change here is the grammatical choices to use the *process* of evaporation, a complex process of water returning to the atmosphere, and a material verb *occur* to encode the meaning given in the congruent expression. “Through grammatical metaphor, ‘everyday’ meanings are construed in new ways that enable the abstraction, technicality, and development of arguments that characterized advanced literacy tasks” (Schleppegrell, 2004, p. 72). And while nominalization is important for academic language, for the purposes of this study, another kind of grammatical metaphor is examined, which is labeled interpersonal metaphor.

The interpersonal metafunction, as stated earlier, has to do with how we create relationships with others. These relationships help to orient how information is presented from one speaker to another or between the speakers. For this study, I examine how the teacher orients the concept of summary for the students. Interpersonal metaphors, in SFL, are of two types: modality and mood. For this study, I examine interpersonal metaphors of modality.

An interpersonal metaphor of modality projects “the speaker’s opinion regarding the probability that his observation is valid [and] is coded not as a modal element ... which would be its congruent expression, but as a separate, projecting clause” (p. 354). For example, “the congruent form *it probably is so* corresponds the metaphorical variant *I think it is so*” because “the proposition is not, in fact, ‘I think’; the proposition is ‘it is so’. This is shown quite clearly



by the tag ... I think it's going to rain, isn't it?" (ibid). For this study, the concept of summary was talked about using incongruent expressions to orient the students towards an understanding of the concept of summary. These incongruent expressions, or interpersonal metaphors of modality, set out directives by the teacher's classroom talk to frame the concept of summary. Examining the degree of force of these directives helps show how the teacher's language choices affects what the students understand to be the important, or not so important, components of the concept of summary.

### **3.3.7 Data sources and data analysis conclusion**

The multiple data sources and possible analytical approaches were designed to provide avenues of examination to complete the very complex picture of a scientific concept's development. When a student discusses a concept with another student all indications suggest the students will use an informal register. This register use however is not an indication that the students do not understand the concept, just as using words in an academic register is not evidence the students do understand the concept. Either aspect, the peer interaction and informal register, or academic register use by a student, yields information about those separate interactions only. But taken together, with semi-structured interviews, visual mappings, and demonstrated use of the concept combine to provide a complex and diverse picture of the student's understanding of the scientific concept being examined.

### 3.4 CONCLUSION

In this study, the texts developed within schooling are of a specific genre (see Figure 1). This genre has specific cultural components which are unique to its setting. One of the most notable of these components is the language used in schooling. It is in this situation where language is used, and this use is realized in the language choices made by users. This language use is also the primary tool people use to mediate their thinking. An analysis of language choices as they were used to develop the scientific concept of summary as it developed in schooling is what was done in this study (see Table 1).

SFL is a suitable theoretical framework and analytical tool to examine the development of higher mental functions, specifically the development of scientific concepts as framed by Vygotsky.

In the study carried out here, an SFL analysis of the language used in the classroom and interview talk was examined for evidence of the development of scientific concepts. The graphic representation and final product were material products of the development of a scientific concept, as well. And taken together, language and material, gave us a unique opportunity to understand the complex image that students were forming of school valued scientific concepts. It should be noted that SFL is based on the idea that language and grammatical choices are *probable* choices within informal or academic language choices. To simply count the occurrences of “and” or “when” is to miss the point. One must look to the classroom texts across time and a multitude of choices to track development.

The research questions together with the SFL analysis help to illuminate how the concept of summary developed across the time and within the interactions of the participants. The following research questions direct the study.

**Table 1.** Research Questions

| Research Question   | Data Source   | Analytical Tool   |
|---|---|---|
| Does scientific concept development occur in one ELA curricular unit?   | Verbal protocols<br>Student interviews<br>Teacher interviews<br>Graphic representations | SFL text analysis<br>Comparative changes in graphic representation<br>Final interview w/ Ss for self-regulation of the concept in focus |
| How does the students' talk demonstrate the dynamic interplay between spontaneous and scientific concepts?                              | Verbal protocols<br>Student interviews  | SFL text analysis   |
| How does the teacher talk support change from spontaneous to scientific concept development in two students?                            | Verbal protocols<br>Teacher interviews  | SFL text analysis   |
| What evidence do the two students present to indicate that they have developed (e.g. complexity, etc.) the valued scientific concept(s) | Verbal protocols<br>Student interviews<br>Graphic representation<br>Final work product  | SFL text analysis<br>Change in graphic representation<br>Interview to determine self-regulation   |

Scientific concepts can be tracked by the *movement* or the change over time of student language. This study analyzes this change over time using the idea that as students move, indeed if students move, from everyday spontaneous concepts to academic scientific concepts their language choices will reflect this movement. The students may move from using highly personal, concrete everyday language to speak about the concept to more impersonal, more abstract and lexically dense language within the classroom setting.

#### **4.0 DATA ANALYSIS AND FINDINGS**

This chapter examines the data collected from one 12<sup>th</sup> grade English Language Arts class focusing on British Literature in a small rural high school. The chapter is organized chronologically, so that change over time and across the curriculum can be tracked. First I examine the initial teacher and student interviews and their concept maps. Then I examine the classroom talk that occurred between the first and second interview, and second teacher and student interviews and their concept maps. And finally, I examine the third and final student interviews, their concept maps and the final summary task, as well as the teacher's final concept map. This approach allows me in essence to map the concept's strands as they were put together to develop meaning across these spoken and written texts.

The concept of summary was a part of a book review the students did on a British novel of their choosing. The work on the book review began the first week of school and the final book review was due in early October, so the unit was approximately five weeks in duration. Eleven of the twenty-seven class days that occurred during this span were audio taped and transcribed. The other days in this time period were taken up with library or computer room visits or school events such as picture or spirit days. Teaching on the concept of summary took up approximately 90 minutes of class time scattered over four days. The teacher and the two students, who were the focus of this study, were each interviewed three times over the course of the five weeks. The initial interview with each participant occurred prior to any classroom teaching about the concept

of summary. Over the course of the unit, there was much talk not related to the concept of summary (i.e. attendance, behavior, side talk) and this talk was not included in the analysis of the concept of summary.

#### 4.1 DATA ANALYSIS

The discourse analysis for examining much of the classroom and interview talk, as was stated in chapter 2, is based on Systemic Functional Linguistics (SFL). Language, in SFL, is designed to fulfill three functions, or metafunctions simultaneously: *Ideational*, how we represent experience; *interpersonal*, how we enact social relationships with others; and *textual*, how we organize information (Eggins, 1994; Halliday, 2003). Because concept development, as an experience, is represented in talk between the teacher and students I have chosen to focus my analysis on the ideational and interpersonal metafunctions to examine how the concept of summary developed over the unit and across the talk between teacher, students and researcher.

The ideational metafunction is concerned with the clause “as a way of representing patterns of experience” (Halliday, 1994, p. 106). To help represent the patterns of experience, I examined how words the teacher used to exemplify the concept of summary include congruent or everyday language, and non-technical vocabulary as a way to represent reality. This language use, I will argue, may have contributed to keeping the concept of summary from developing towards a scientific concept in one of the students.

I also examine the grammatical choices the teacher and students make to construct a representation of experience realized through transitivity, which “construes the world of experience into a manageable set of PROCESS TYPES” (ibid). The experience being

represented in this case was the development of the concept of summary. Analyzing the processes that the teacher and students chose as they represented their idea of summary allowed me to understand how they were conceptualizing summary. For example, when the teacher said, “a book review is going to be a different kind of summary” (APPENDIX D.2) the relational process verb *to be*, underlined above, established a relationship between the two separate nominal groups, *book review* and *a different kind of summary*. In this example, the relational process choice was an intensive identifying process, which enabled the language user, the teacher in this case, to define *book review* as a part of a group or class labeled *summary*. Book review was one type of summary. The analysis of transitivity as realized in the process choices allowed me to examine how the development of the concept of summary, in this case, was construed as an experience in the classroom between the participants. Because the teacher was giving information to the students about the concept of summary, examining the language that she used to develop this concept helped me map out how the concept of summary was presented to the students.

By examining the ideational metafunction, I was able to analyze and trace how the teacher’s grammar elaborated, enhanced or expanded on the idea of summary. For example, when Steve was asked in his initial interview about what he thought was important in summary he indicated that a summary had to include “an overall grasp” and “main parts” of what was read. The exchange went as follows.

*Example 1 (R=researcher, T=teacher, S=Steve, L=Leslie)*

R1     Do you think you find those main points in a certain place, or with certain words the author uses to highlight ideas?

S2 it could be, or it could be one line that is for the person reading the summary or even a word if it has that much of an impact.

(APPENDIX D.5)

Steve *extended* and added variety to where a main point could be found or what a main point might have looked like by choosing to use the coordinating conjunction *or* to combine clauses and extend meaning. Analysis of transitivity and the logical connection of ideas can help me illustrate how the concept of summary is being represented and thus developed as it is being talked about between teacher, students and researcher.

To explore how the teacher's language use created a social relationship that contributed to the students' development towards the scientific concept of summary, I examined the linguistic realization of the interpersonal metafunction via an examination of interpersonal grammatical metaphor. Interpersonal grammatical metaphors, in this case metaphors of modality, "represent[s] the speaker's angle, either on the validity of the assertion or on the rights and wrongs of the proposal" (Halliday, 1994, p. 362). These metaphors encode the speaker's opinion regarding the probability and the necessity of the proposition (information presented within the clause). For example, when the teacher explained what she wanted the students to do with a reading they were doing, she said, "I want you to analyze it" (APPENDIX D.2). This incongruent way to communicate a direction to the students seemed to be saying what she wished from the students, and that was to analyze the piece. The congruent form of this demand would be "analyze it," but the teacher expressed it as her belief about what the students *should* do, which is a median sort of declarative statement and not a demand (Halliday, 1994). The clause, *I want you to analyze it*, represented the teacher's desire, and can be thought of as, *I (the teacher) think you (the students) should analyze it*. The clause *I want you to analyze it*



semantically projected the command *analyze it*, but metaphorically represented the teacher's wishes. This type of interpersonal metaphor was used repeatedly by the teacher, as she sought to tone down her commands and construct a less hierarchical relationship with the students. But this type of talk also gave quite a bit of power to the students to decide what they could include in their summary, instead of having the teacher set out for them explicitly what the school valued scientific concept of summary *had to* include or represent.

In addition, I investigated the type of words participants used to represent the concept on their concept maps. I did a content analysis of the type of words used by the participants to represent the concept of summary. I analyzed the words used by the participants to better understand the topics, ideas and meaning related to the concept of summary. I also examined the quantity and the structure of the nodes to represent depth and breadth of the concept under examination (Leinhardt & Gregg, 2002), which is critical if we are to understand the web of logical relations (Vygotsky, 1997) students and teachers use to understand the scientific concept of summary.

#### **4.1.1 Initial developmental level –Participant interviews and concept maps**

This section examines the initial interviews of the teacher and the two students, and then examines the concept maps for all three participants. Understanding the initial developmental level of students as they learn was important for Vygotsky's (1978) psychology of learning and development, as can be seen in his emphasis on understanding this level when teacher and student work in the zone of proximal development (ZPD). Knowing the teacher's initial level of understanding of the concept was critical because this was the concept she held as the ideal concept, or the concept she worked on with the students to develop. Said another way, as a

representative of the school, it was her concept that the school counted on her putting forth, and for the students it was the concept against which they would be judged. What she understood as the concept was what she instructed her students to develop or acquire during the lessons of the unit.

#### **4.1.1.1 Initial interview - Teacher**

During the initial teacher interview, held before any explicit instruction on the concept of summary began, the teacher set out her understanding of the concept of summary. It should be noted that without my interaction with the teacher and students, the focus and explicit understanding of the concept may have been quite different. This is because of the extra time and attention that was paid to the concept of summary during the interviews, concept map drawing, and final summary task writing.

In her initial interview, the teacher framed summary as an important concept for the class. As was stated earlier, summary was an important piece of a book review the students were going to do. Our initial exchange is below.

##### *Example 2*

R1     What role do you think summary plays, if any, in the book review?

T2     I think it plays a great role. I think summary is important in almost everything we are doing because ...even if they are responding to what a peer says they have to reiterate their notion they have to understand their peer's idea and usually restating it in terms of refuting it or responding to it is a part of that right?

(APPENDIX D.4)

The two initial clauses show the teacher's use of an interpersonal metaphor to help express her understanding of the concept of summary, but should be seen as a part of an adjacency pair with my initial (R1) question. *Think*, a mental process, projected her opinion about the importance of summary in the book review. The congruent form would be *summary plays a great role*, whereas the metaphoric variant, *I think it/summary* (T2), set up her opinion as *summary probably plays a great role* or *is important*. Halliday argued for this view by showing how placing a tag question at the end of the initial clause helped to illuminate the metaphoric meaning behind *I think*. If we were to tag the clause, *I think it is important*, the tag is *isn't it*, versus *don't I*. So the clause and tag read, *I think it (summary) is important, isn't it?* The clause was a variant of *Summary is probably important, isn't it* and not, *The teacher thinks summary is important, doesn't she?* This interpersonal metaphor set up summary as *possibly* important to the book review. The framing of the possibilities of summary's makeup was seen through out much of the classroom talk, and her use of *think* in this example was the beginning of her open definition for the concept of summary. There was a low degree of certainty about the role of summary in the book review. This metaphoric use, as we will see, continued through out the lessons and interviews and helped to set up the very broad parameters of summary, and summary's role in the review.

Example two also focused the peer response as a verbal process, *respond, say, reiterate, restate* (T2). The summary contained in this response was to repeat, *restate* or *reiterate*, what had been said, so the responder could evaluate, *refute* or *respond*, to the initial comment. Summary was grounded in orality, which contained an evaluation of what was being summarized. So in example two the teacher put forth summary as a largely oral act that *might have* a certain importance in a book review. This emphasis on orality helped frame summary as a

congruent and everyday concept, versus representing the task of summary as a written school valued task, where incongruent and technical language were valued. Her uncertainty, as realized in her language, (i.e. I think) presented the definition of summary as an open ended or formless concept.

I asked about the students' understanding of summary prior to entering her class. It was important to understand the students' initial developmental level of the concept of summary she indicated the students were experienced with the concept of summary.

*Example 3*

R1 How much do you think these students are bringing with them from prior courses that will aid them in what you're doing? Do you have a sense of this? Are they coming with some understanding, is this new understanding?

T2 are we talking summary?

R3 summary and book review, excuse me yes.

T4 I uhm find it difficult to review, as I am doing this review I find it difficult to summarize even though I have a ton of experience writing so sure they're coming with a lot of experience I imagine, but I don't know how much I mean if you look at some of the questions some of the other teachers ask them I mean they're not asking them to be they are just asking them to give back a sentence, so I don't know how much experience they are coming to class with.

R5 because there is a difference between parroting and summarizing.

T6 Right and I think they are just used to giving back what was said to them

R7 I can give you back what they said but do I understand what they said, I need to recontextualize it

T8 and I think they are used to giving back directly what was said  
(APPENDIX D.4)

The students had as a part of their schooling repertoire, coming with (T4), experience with summary, but experience, which the teacher thought (T6), was probably centered on repeating what the teacher wanted them to know (T8). Yet, as stated in example two earlier, she considered this, *restating*, a component of what students needed to be able to do when summarizing. So, students were aware of the concept of summary, but the teacher framed the ability to parrot back information as maybe not sufficient for the class she was leading, when she said, “they are just used to giving back what was said to them” (T6).

Another topic that occurred in the initial interview, which proved to be important to much of the classroom talk about summary and the book review, was the concept of *tone*. The following excerpt was the initial talk about the importance of *tone* to the teacher.

*Example 4*

R1 Some of the questions I have first are, uh, when you say book review what are your expectations of the students?

T2 Well, I want them to be a reviewer. So I want them to establish tone, that is something that we'll get into, I want to know whether they like it, I want them to recommend it or not uhm, I want them to understand the major *ideas* (emphasis)I mean like the first part is an opening quote

and then explaining why you picked the quote or how it is reflective of the author's style or indicative of the author's style so, so I am trying to see, a lot of them like get to the crux of the issue and they pick the quote that is most meaningful, and these are some things I can talk to them about why they have chosen that...

R3 Can I ask, when you said tone, what do you mean by tone?

T4 I want them to like work on what it is, what kind of message they are trying to convey

R5 the piece itself or them as writers?

T6 Them as writers

(APPENDIX D.4)

The goals for students' reviews were quite broad and this was shown by examining the teacher's interpersonal grammatical metaphors. In the introduction to this chapter it was shown how the use of *I want* was an incongruent way to express a command. In example four, the teacher explained what she wished the students could do in the review. The students should be reviewers, I want them to be a reviewer. The students should establish tone, I want them to establish tone, should express whether they like what they are reviewing, I want to know whether they like it, should recommend the work, I want to them to recommend it or not, and the students should understand the major ideas (T2). These were all *possibilities* for the students and the work they were to do with the review. From this set of possibilities it was as though *reviewing* was a task where the students could express their opinions about the text (i.e. like or recommend) and understanding the major ideas was just one more choice among many. Because the teacher equated summary and review in class (see Example 10, APPENDIX D.2), understanding the

major ideas, which had been shown to be a major component of doing summary (Gallini & Spires, 1995; Winograd, 1984), became one of many possibilities and not a valued component of summary marked by explicit teacher language highlighting the importance of understanding the major ideas.

*Tone*, first mentioned in the early part of the example (T2), became the subject of a clarification question, “What do you mean by tone?” (R4), whose response, “I want them to like work on what it is” (T4) indicated that maybe the teacher was unsure what she meant by *tone*. “I want them” has been shown represent a possibility, but the possibility was further diluted by more hedging represented in the word “like”. *Like* was not setting out an example, it was expressing further possibility. For example, if asked, “what will you do tonight” one could answer, “I might like go swimming or like ride my bike.” *Like* in this example is synonymous with *maybe*. For the teacher’s example, *like* splits the infinitive “to work” and functions as *maybe* and as a further hedge. The sentence “I want them to like...” semantically projects what this *means*, but metaphorically expressed, *Tone means, students should maybe work on what the (text) is or what kind of message they (as writers) are trying to convey.*

In this initial interview with the teacher, the review was framed as open ended where the students could play a number of roles (i.e. reviewer, or evaluator), and could include a number of parts to the story (i.e. major ideas, tone, or quote) (T2). This fluid definition for review and summary carried over into the classroom talk as we will see in later sections.

Both of the student participants were interviewed the day after the teacher was interviewed and before explicit teaching on summary began. Steve and Leslie, pseudonyms, were seen by the teacher and themselves as successful students, who wanted to continue their schooling at the university level. Both students had been a part of the community for most of

their lives, and easily interacted with both teacher and peers. They were both outgoing and involved in school, with Leslie being a cheerleader and volleyball player, and Steve being deeply involved with the schools theatre productions. Both were eager to participate in the study.

#### 4.1.1.2 Initial interview - Steve

In his initial interview, Steve began developing his concept of summary by using certain words to explain summary.

##### *Example 5*

R1 so tell me a little bit about what you think summary is?

S2 an overall grasp of a reading, any reading

R3 do all parts of the article need to be included in the summary?

S4 no just the main parts, or the main part

R5 do you think you find those main points in a certain place, or with certain words the author uses to highlight ideas?

S6 it could be, or it could be one line that is for the person reading the summary or even a word if it has that much of an impact. But usually a line or a few sentences that give it a nice overview of what the article is all about

(APPENDIX D.5)

In this example, *main parts* (S4), *overall grasp* (S2) and *nice overview* (S6) represented components to summary, which enhanced the logical-semantic relationship to the concept of summary. Steve also extended his understanding of the concept of summary when he chose to use the coordinating conjunction *or* to combine clauses (S6). The conjunction usage helped to



delineate where main ideas could be found (i.e. one line or a few sentences) or what a main idea might be (i.e. a word with impact).

In the initial interview, I asked Steve about the concept of tone, which had been used in the teacher's initial interview. Knowing it was a key component to the teacher's concept, I was interested in his understanding of the term *tone*.

*Example 6*

R1 I wanted to ask you what you felt the word tone meant.

S2 the tone of the story I feel is the way that it has impacted the writer of the story, the way he is hearing the story, the way he or she is hearing the story, whether she is happy or sad or whatever it is, the tone of whatever it is that they are trying to get you to understand

R3 is tone conveyed by words, or together with sentences?

S4 I would say that it is tied together with words and the characters and everything like that

(APPENDIX D.5)

The concept of *tone* was related by the mental process of *impact*, in that *tone* conveyed happiness or sadness, or other emotions to the person listening to the story. And this made *tone* related to the behavioral process of *hearing*. The story was being read and thus heard, and when the listener heard the story, it conveyed emotion to the listener. These processes together with *the ways* the story (S2) affected a listener, seem to frame the summary as narrative or as a story itself. As I will show later, this behavioral process of hearing relates in many ways to the way the teacher began framing the summary as a verbal process, of saying, restating or verbally refuting.

#### 4.1.1.3 Initial interview - Leslie

In the initial interview Leslie responded to a question about summary.

*Example 7*

R1 what do you think goes into a summary?

L2 Uhm, you don't put like all the information ... you can't tell the whole story, you know what I mean? You give a kind of brief you know what it's about

(APPENDIX D.6)

Leslie used the material process, *put*, to represent the summary as a place where information was physically located. This represented the summary as a container, or as an empty entity where you could *put* information. She used the verbal process *tell* to represent summary as an oral account of parts of a story. And her other process, *give*, could be either material, as in *give me that book*, or verbal, as in *give me your version of events*. These words helped ground summary in orality, and summary was to include parts or brief sections of a story.

Later in the initial interview as she was explaining what parts one might put or give in a summary, Leslie and I had the following exchange.

*Example 8*

R1 no, I understand, I think you're talking about the high points or the

L2 yeah, you can't be like well one day she went out and picked flowers and blah, blah, blah you can't be like that

R3 things that might seem inconsequential

L4 you need the climax of the story

R5 the resulting thing, the big

L6     yeah, they went through many difficult things to get together but in the end or something like that

R7     do these important points come in a, I guess my question is, how do you know what's important? Because there's lots of information

L8     how do you, uhm *pause* there's lots of important information in the story *pause* the main point of the story. What the writer wants you to find out.

(APPENDIX D.6)

I included this extended dialogue for three reasons. The first was to highlight the words she used to represent the components of summary. Leslie used the mental process of *need* to represent her thoughts about including the *climax* as a component within the summary. And she included *the main point*, which was *what the writer wants you to find out*, as a part of summary. The functional-semantic relationship of both *climax* and *main point* helped to elaborate or provide further characteristics to the concept of summary.

The second reason the extended dialogue was included was to highlight non-technical or congruent language she used to represent her examples in talk. Something like that, many difficult things, blah, blah, blah, and lots of important information all represent congruent, general and non-technical examples for parts of summary. She did not use specific, incongruent and technical vocabulary to talk about and develop the concept of summary.

The final reason for including the extended dialogue is to show the dialogical nature of the interaction between the researcher and the participants. The construction of the concept of summary was an exchange and a building off of ideas given by one participant to the another. This can be seen at the end of each line where the thought is interrupted by the other participant

as he or she builds off of what the other said or was saying. I highlight this because in Vygotsky's theories on learning and development (1978, 1997) and Halliday's linguistics (1994) language used in the interaction between people in social contexts, particularly schooling for scientific concepts, is critical for the development of concepts and academic language.

#### **4.1.2 Participant Concept maps**

After the initial interviews with the teacher and the students, the participants were asked to draw a diagram of the concept of summary with very little instruction from me. I simply asked them to represent summary in a graphic that made sense to them, and that they then could make sense of to me. After the second and third interviews they were presented with their version of their concept map of summary and were asked whether they wanted to (1) amend the map by subtracting or adding to it; (2) leave it the same; or (3) redo it entirely. None of the three participants chose to either subtract information or redo it entirely after the second and third interviews.

I examine these maps by highlighting the words the participants used to represent the concept of summary and by using a procedure set up by Leinhardt and Gregg (2002) to document the depth and breadth of a concept. Leinhardt and Gregg examined webs, similar to what I have called concept maps. In these webs, nodes connected to the center circle were considered level 1 entries. Nodes attached to level 1 nodes were level 2 and so forth. The complexity of the changing webs was examined over a period of time where the participants, much like the participants in this study, could reexamine the webs and add or delete information as they wanted. The comparison of the changes and the level depth were considered together to form an understanding the depth and breadth of the idea at the center of the web.

I view the words that extend from the word *summary* as logical extensions from the word, and instantiations of the ideational metafunction. These logical extensions of the word *summary* were selected by the participants to represent semantically the concept of *summary*. To understand the noun *summary* requires seeing the logical-semantic relations to the word (Halliday, 1994, p. 191). The map is a representation of the participants' logical-semantic relations, since these words are used to modify the concept of *summary* over time.

The structure of the maps can be analyzed as a representation of the depth and breadth of a concept (Leinhardt & Gregg, 2002). For example, the teacher's initial map had five levels at its deepest point (*summary*>*tone*>*main idea*>*supporting points*>*omissions*; See Figure 2). At the first level there are five nodes, *tone*, *evaluation*, *author*, *purpose* and *audience*. The levels and nodes represented on this map of *summary* can then be compared against other similarly constructed maps to examine differences in depth and breadth. I can also then examine how the maps change from one interview to the next, and examine what parts of the concepts specifically become deeper and broader at each point in the instructional unit.

I present each map separately, analyze them, and then compare the maps. The maps are a *part* of the participants' initial developmental level of the concept of *summary*. The map is one source of information that taken together with the analysis of talk represents another vantage point from which to understand the concept of *summary*.

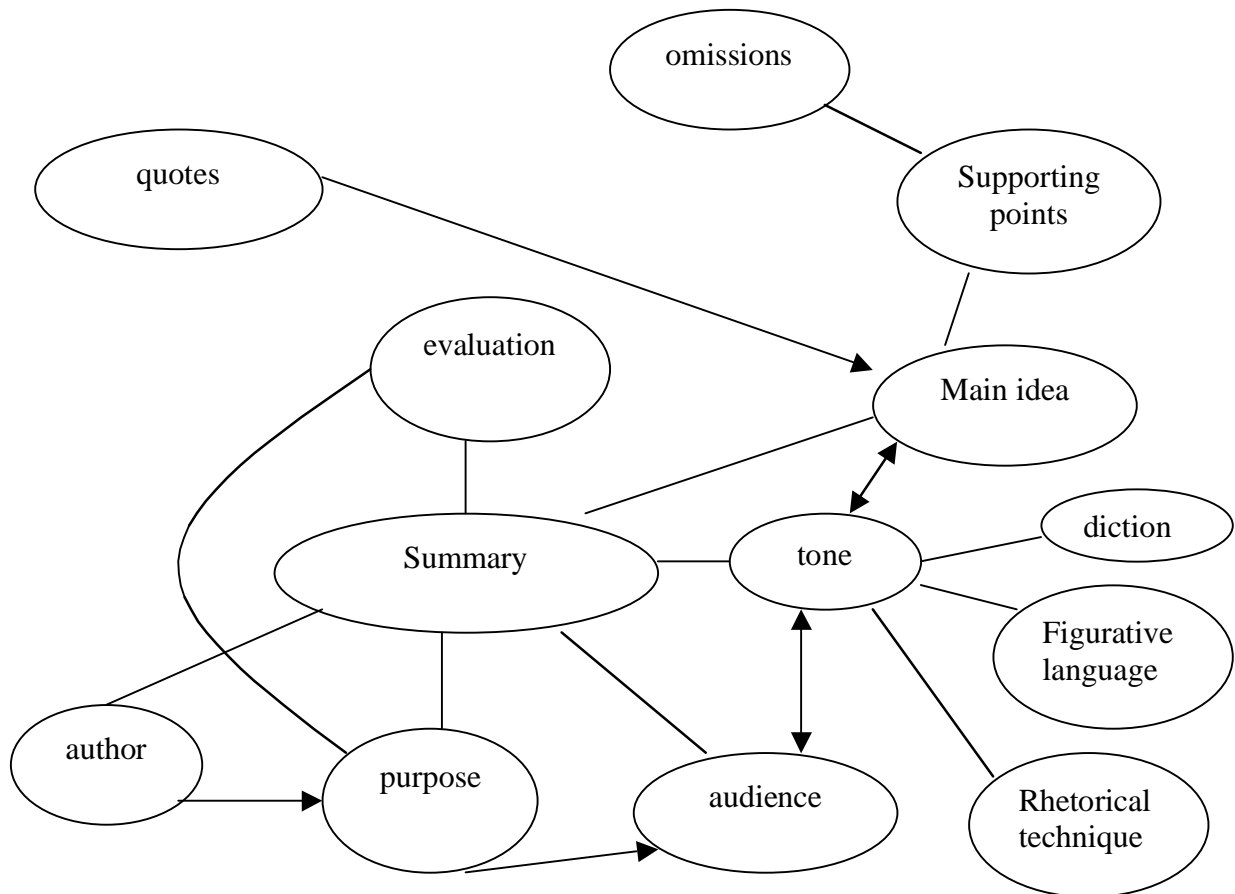
#### **4.1.2.1 Teacher's concept map**

The initial understanding of what the teacher values as a part of the concept of *summary* is found in the logical-semantic relations of her map (e.g. *tone*, *main idea*, *diction*, see Figure 2 below). We would expect that if the words used in this map are a representation of the mental reality, as Vygotsky (1997) and Halliday (1994) argued, then some or all of these lexical items as they

relate to the overarching concept of summary would be expected as part of the teacher's classroom presentation about the concept of summary. Indeed, these lexical items did occur in part during her presentation to her class.

The teacher's initial concept map (Figure 2) showed the scientific concept represented in a word, as a complex image with multiple determinations and a complex set of relations and connections (Vygotsky, 1997). The teacher's scientific concept of summary represented in the initial interview was the goal of the teacher's lesson and was the concept that the students were to develop over the course of instruction. Her map was interactive in form using arrows to inform how for example, *tone*, was represented as affecting *main idea* and *audience*. In turn, each of these nodes could affect *tone* as well as evidenced by the two-sided arrows in between the nodes.

The teacher's concept also included a writer, or *author*. According to the teacher, this author also had a *purpose*, which might have be to *evaluate*. The map also contained the node *tone* as one of its major components. Not only did *tone* stem directly off *summary* at the first level, but also *tone* had the most amount of nodes emanating directly from it. These words served to highlight the component ideas that the teacher understood to be important to the concept of summary. As a structured web of relations, the teacher's concept map had four distinct levels at its deepest extension (i.e. *tone*>*main idea*> *supporting points*>*omissions*) with a total of thirteen nodes. This complex and interactive representation of the concept of summary illuminates how the teacher understands the relationship between the sub-concepts related to the overarching concept of summary.



**Figure 2.** The teacher's initial map.

#### 4.1.2.2 Steve's concept map

Steve's initial concept map had a total of seven nodes with two levels off summary. The words representing the logical-semantic relationships, while not simple, seem to be synonymous as is shown below. In the second interview, when I asked for clarification on the term *run through* Steve explained

*Example 9*

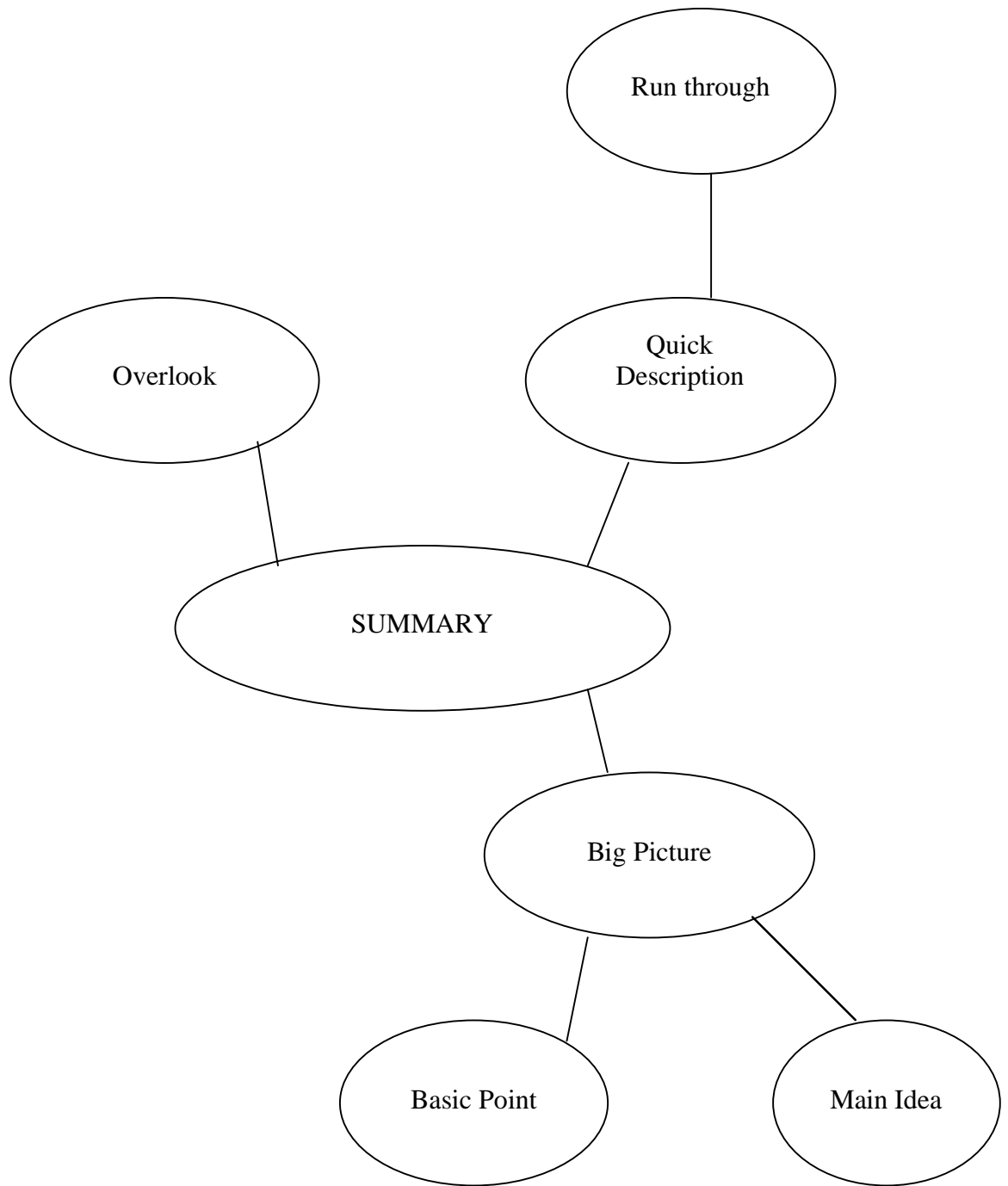
R1 what is a run through?

S2 oh that is my theatre mind, uhm, it's a description, it's a quick overview of what is happening, when you read a script it is a quick run through the scene or the song ... no costumes, the big picture of things, at the act level, usually.

(APPENDIX D.7)

The words to expand the concept of summary were repeated in four of the seven nodes. *Big picture*, *quick description*, *overview* and *run through* were all synonymous terms for each other. These synonymous terms showed Steve to be unclear about the distinct components that comprise the concept of summary. Instead of using nodes to build logical relations (i.e. summary>tone>diction, figurative language, rhetorical technique) as the teacher did, Steve allowed the nodes to serve as catch all phrases, which were not distinct from each other, for his concept of summary. It was as though he put terms within the nodes to hold down his thoughts about the ideas related to summary without considering how these ideas might be different from each other. Unlike the teacher's map, there was no interactive relationship shown between the nodes.

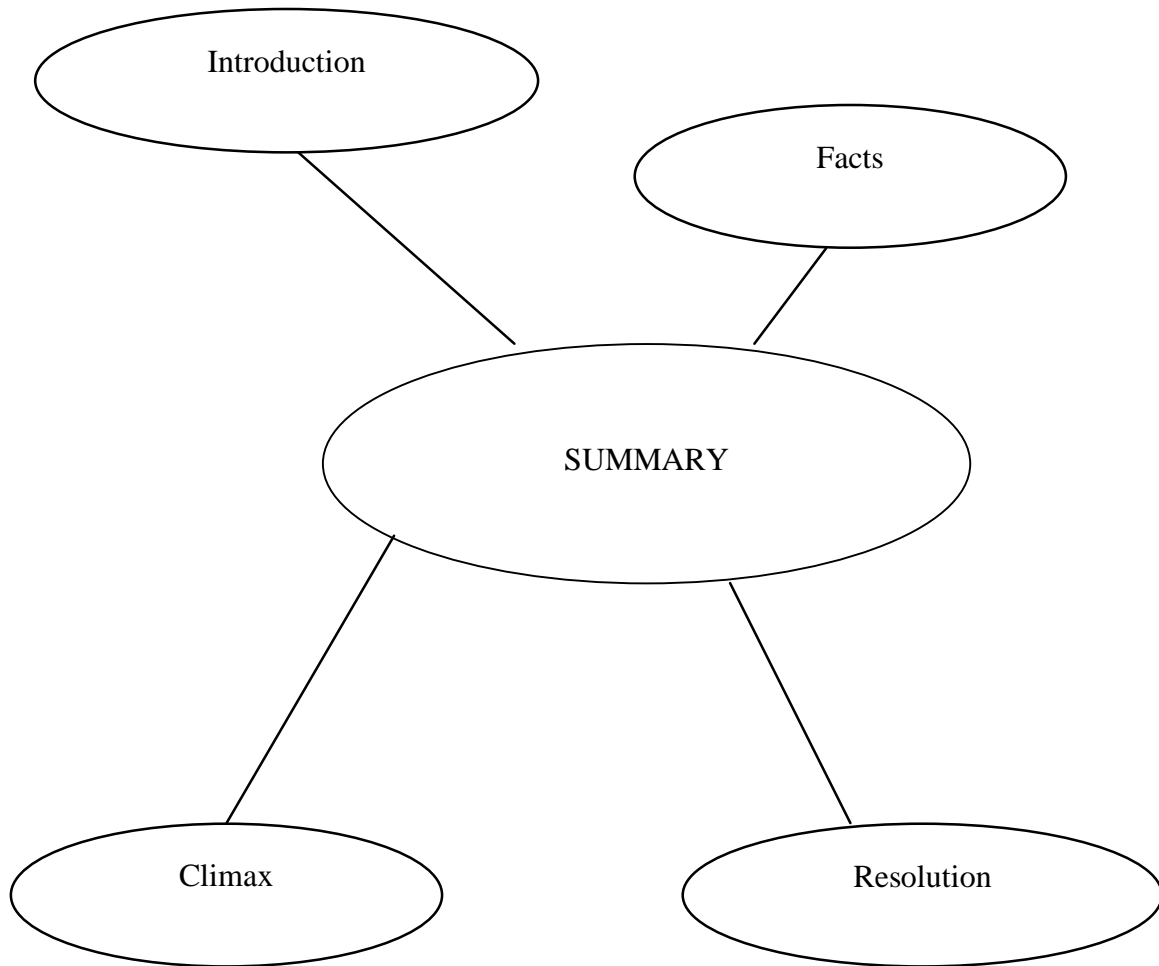




**Figure 3.** Steve's initial concept map

#### 4.1.2.3 Leslie's concept map

Leslie depicted summary with four emanating nodes from the node of *summary*. The logical-semantic relationship of the four nodes connected to summary illustrated parts of a summary. At the top left, Leslie began with *introduction*, moved to *facts*, reached the *climax*, and provided a *resolution*. It is as though the list of what comprised summary could be read from left to right and top to bottom, thereby, giving us the total summary. Each part of her concept was related structurally to the act of summary. Similar to Steve's concept map (Figure 3), and unlike the teacher's visual representation of the concept of summary, Leslie did not indicate an interactive relationship among the nodes.



**Figure 4.** Leslie's initial concept map

#### **4.1.2.4 Comparison of teacher and students' concept of summary**

The teacher's map was clearly more complex than those of the students. Not only did it represent an interactive relationship between the components of summary with nodes of related information, but it also contained more nodes. These nodes also had deeper connections to other nodes. The teacher's concept used a total of thirteen nodes, with from two to four extensions

attached to these nodes; whereas, Leslie's map had a total of five nodes with no elaboration after the first level. Steve had more nodes than Leslie, seven, and from two to three extensions from some of the principal nodes. If we treat each node as an idea unit (Leinhardt & Gregg, 2002) then the teacher's ideas about what comprises summary was richer than the students, which should not be surprising.

The logical-semantic relationship between the nodes, as was shown, was more interactive for the teacher, as opposed to the structural composition of Leslie's concept or the repetitive relationships expressed in Steve's. The maps visually represented a difference in the teacher and students' initial understanding before they worked together to develop the scientific concept. These maps serve to mark an initial point where the students and teacher were with their conceptual understanding of summary, and serve as a baseline to which we can refer as the analysis moves forward.

In sum, the initial interviews and concept maps represented the initial developmental level the participants had of the concept of summary. The teacher represented summary as an oral and written act, where restating, reviewing, evaluating, recommending, reiterating major ideas, and establishing tone were all possible parts of summary. The teacher's components of summary represented in interview talk can then be added to the components on the concept map (i.e. omissions, audience, etc) and taken together, form the initial concept of summary. For the teacher, the interactions depicted on the concept map, the components of the concept map, and the focus of interview talk operated together to form the complex image or a scientific concept of summary.

The teacher's scientific concept of summary stood in contrast to Steve and Leslie's initial concept of summary. Steve and Leslie's represented diffuse complexes, where the components

have unreal or unstable links to the concept. These diffuse complexes are a form of a spontaneous concept. Steve's spontaneous concept components (i.e. big picture, quick description and overlook) were shown to be redundant. Steve's focus on language (i.e. in establishing tone or highlighting main ideas) as a component of summary was shown to be weak and he represented summary as an oral production (i.e. hearing a story).

Leslie's talk and map of the spontaneous concept of summary was, on the other hand, a semi-stable definition of summary. The components Leslie marked in talk (i.e. climax, and main points or facts), were highlighted on her concept map as well. But similar to Steve she grounded the concept of summary in orality (i.e. tell or say). She also provided weak links to the concept of summary by using everyday, non-technical, and general language (i.e. blah, blah, blah and important information).

These initial developmental levels of the concept of summary will come together to construct a web of complex and logical relations as the participants work together to develop the concept of summary. Having depicted the initial developmental level of the concept of summary, the subsequent analysis can address the following research questions: (1) How does the teacher talk support change from spontaneous to scientific concept development in two students?; (2) How does the students' talk demonstrate the dynamic interplay between spontaneous and scientific concepts?; (3) What evidence do the two students present to indicate that they have developed (e.g. complexity, etc.) the valued scientific concept(s)?; and (4) Does scientific concept development occur in one ELA curricular unit?

Question one, two, and three are addressed by the analysis in the following two sections. The fourth question is addressed in the conclusion of this chapter.

### 4.1.3 Classroom talk and second interviews/concept maps

In the following section I analyzed classroom talk that occurred between the first and second interview. It should be noted here that all of the teacher talk concerning summary occurred between the first and second interviews, which covered seven instructional days. It must also be noted that the majority of the talk was teacher-centered lecture with little to no involvement from the students as the talk about summary occurred.

After the initial interviews, the teacher began her work on the book review, of which summary was a part<sup>vi</sup>. As the teacher began working with the students to develop the concept of summary she stated, “in a book review, I don’t want too explicit a summary because you are trying to intrigue your reader” (APPENDIX D.2). The use of *want* here was an indication of her desires for the book review. *Want* was used to orient her students to the task of the book review through the lens of her desires. The students were not to be too explicit because doing so would be outside the scope of her needs for the book review. The review must adhere to her framing of the book review and its components. The students were to write the review for her and her standards without considering that review as a genre might have a form and function that existed outside her wants for the review.

In the extended excerpt from classroom talk given below, I analyze how the teacher’s talk frames the summary as grounded in orality, elaborates the concept of summary for the student, and uses congruent non-technical language to exemplify and develop the concept of summary in the context of writing as book review.

#### *Example 10*

for a book review you want to give us enough information to make us  
want to read the book, but not so much as to ruin the story for us, instead

of saying for example, ... but instead of saying something like, Uhm John came home and was shocked to find his wife banging his best friend, you might want to say, uhm, John came home to a shocking surprise that would change his life dramatically or lead to events of his demise, uhm you don't want to say his best friend was banging his wife because we want to say, ohh, what was that shocking event that altered his life? Ya know, so a book review is going to be a different kind of summary and if you're talking about a news article and this dude committed murder he's pleading temporary insanity because his best friend was sleeping his wife, you're gonna wanna tell us his best friend was sleeping with his wife  
(APPENDIX D.2)

In this extended excerpt, the teacher consistently referred to the writing of the review as an oral process. To begin, she repeated what type of example the students should *say* in their review “instead of saying” or “you don’t want to say”, or how they should *tell* us what was occurring. “you’re gonna wanna tell us”. These words grounded the summary task as an oral process. Defining the work with oral processes became quite common throughout the lesson as the teacher continued to present the use of summary in the review task. And while I acknowledge that writing teachers often speak of writing in these terms, it is important to note the enculturation of a learning context relies heavily on the language used in the context (Vygotsky, 1978), and if this is in fact the case, then framing a written product as an oral process can help confuse the process under examination. The language process choices blurred the lines between written or spoken types of summary, and may have confused the nature of the assignment in the minds of the students.

The assignment became confused and ill defined when the teacher chose to *equate* review to summary, “so a book review is going to be a different kind of summary”. The relational process choice of *to be* in this sentence identifies review as a type of summary, or as one type of summary. In other words, the review is a part of the class of summary, and can be equated with one type of summary; versus, summary being a part of review.

The way that the teacher represented what had to be included in the review can be seen, again, by her interpersonal metaphors. When she said, “you don’t want”, “we want” and “you’re gonna wanna” similar to earlier examples, she was representing the valued parts of summary as probabilities for inclusion. *You don’t want to say*, metaphorically represents *you should say* or *you shouldn’t say*, which is a probable request, and is not a mandate or imperative type of request (i.e. *do this, say this*). These interpersonal metaphors serve to make the definition or parts of what make up the scientific concept of summary unclear and ostensibly negotiable. In this excerpt, she did not explicitly address the institutional academic constituents necessary for the concept of summary. The teacher did not say, *Say this*, and then continued to give a concrete example. In fact, the examples she used to highlight what the students should say were loaded with congruent, and highly non-technical language.

The teacher’s examples in this set of talk (Example 10) began with a discussion of what the students should not include in their review, “Uhm John came home and was shocked to find his wife banging his best friend.” which was juxtaposed to what they should say, “John came home to a shocking surprise that would change his life dramatically or lead to events of his demise.” The negative example was clearly a colloquial, non-technical and non-school valued example (i.e. banging his best friend). On the other hand, the valued example included more school valued phrases and words (i.e. change his life dramatically, and demise). But the positive



example was hedged by the use of the modal phrase *might want to say*, making the choice to use this type of phrasing one of many type, and thus a weak directive from the teacher. Again, the congruent form of *say this* was not chosen by the teacher, and the students were left with a positive example diluted by an interpersonal grammatical metaphor that leaves the definition very much in the students' hands. The colloquial language use, (banging his wife) was repeated again later, and was further exemplified when the teacher said, "this dude committed murder he's pleading temporary insanity because his best friend was sleeping his wife" as a way to contextualize the example. Each of these examples was selected by the teacher to decrease the authority she possessed in the class and to construct a closer relationship with the students by using their language, but there was no structured attention (Williams, 2004) to the academic concept of summary. The teacher's language was not mediating the activity of developing the concept of summary. The initial example brought a collective laugh from the class, which helped to break down the authority the teacher held while giving the examples. As the lesson excerpted above continued, the teacher took up a concept or idea that she had put earlier on her first concept map, and that was the concept of *tone*.

*Tone*, as was shown on her concept map, was an important aspect of the summary and of the review the students were writing. As I showed, review and summary became equivalent concepts in this lecture and as the lecture progressed, exemplifying *tone* became a central part of the lesson. As the teacher was setting out the grading parameters for the review, and talking about types of reviews she indicated how important the concept of *tone* was to their work. Below I provide the extended talk related to *tone* as it occurred across the rest of this lesson. I do this to show how the concept of *tone* became an important aspect to the summary and review, and how she built upon the concept of *tone* through classroom talk.

*Example 11*

tone is something I want you to consider when you are reading and writing because you are going to establish tone in your **piece**... You're gonna want to create a feeling in us and your gonna want to use some sort of tone to do that... There is a tone in that piece (the example of Swift's A modest proposal was discussed)... there is nothing modest about eating children but he was being ironic, he was using irony, and irony is a way to establish tone... you are going to use a tone to persuade us that you are right, when I see the starving Ethiopian child with flies on its eyes and the distended stomach, I want to send my money. There's a tone in that, so how does the author establish tone? Diction, word choice pointing at the BB establishes tone literary figures, you might choose to use irony, how else might you use figurative language to establish tone?

(APPENDIX D.2)

The teacher's talk in this excerpt centers on the **piece** the class is working on, the book review equated to summary. She set out the choices for the summary task in the review for the students by continuing to use the interpersonal grammatical metaphor realized in the utterance, "I want you to consider, You're gonna want to create, and your gonna want to use." These utterances, similar to the earlier examples, set out to give the students an ever-broadening range of options by semantically projecting her wishes through her own metaphoric representations of desire. Her move from *I* to *you* also gave more agency to the students in the choices they could make. The students could create, or consider using tone, which was actually then positioned as a demand when the teacher said, "you are going to establish tone in your **piece**". This directive

was one of the few times she identified for the students what must occur in the review/summary they were working on.

Her lexical selections continued to create a logical relationship to her idea of summary and lexically she was creating a dialogue with her concept map. The words of *tone*, *diction*, and *figurative language* were nodes on her concept map. These words represented her scientific concept of summary and were exemplified by her presentation of the review lesson. These words expanded her idea of *tone* by being exemplars of how *tone* could be represented by the grammatical choices students could make in their piece.

The teacher's example for *tone* used everyday and non-technical language. The teacher said, "when I see the starving Ethiopian child with flies on its eyes and the distended stomach, I want to send my money", as an example of *tone*. This example was meant to show *tone* as an emotive and visual tool (the process, *see*) students could use, but its subject matter seemed to over shadow the example itself and again, made what the example was to exemplify, *tone*, a secondary consideration to the example itself.

As was shown in earlier analysis of transitivity, the teacher framed the summary as oral by referencing the summary as something the students had to "talk about" or "speak". This was further reinforced, whether consciously or not, by her use of the lexical term *diction*, which was a node on her concept map. Diction is synonymous with pronunciation, which is a product of oral language. This emphasis on the oral nature of the work deemphasized the written nature of the summary piece.

The teacher's talk during this classroom episode was largely teacher fronted with little dialogic interaction with the students. The summary's valued parts were also presented as an array of choices the students could make, and were not framed as necessary for inclusion in the

assignment. The teacher's expectations were framed as coming from more or less an equal, and not from a position of authority, as shown by her example and words.

During the next few days of classroom observation, the class worked on a reading of a newspaper article and tried to understand the important information within the article. This classroom talk focused primarily on reading comprehension strategies and not on writing their summary and review, so I will highlight only the talk, which explicitly mentioned the summary of the article they were to review. The first example occurred while the teacher was referencing a review she had found on the computer.

*Example 12*

I've only read one so far ... the reviewer is being sarcastic... so he was using sarcasm. It's also related to tone right? ... so if I'm using and establishing tone and I say this the best work of the decade! Right! That person is using figurative language. It's hyperbole, it's over stating it but at the same time that is part of the review. That's part of how he gets his point across. Through the tone he is establishing.

(APPENDIX D.3)

This talk continued the teacher's emphasis on *tone* as a valued part of the review, by stating back to her original idea of *figurative language* and extending the logical-semantic relationships to *tone* by adding sarcasm and hyperbole to *tone*.

She expanded the class' concept of summary the next day as she was discussing the newspaper article they were reading and the practice summary they were to write. In this talk, she continued to metaphorically represent her wishes when she said in reference to the review and the practice summary they were doing, "Now remember, in your summary I want you to

have one quote.” At this point, her semantic projection of *I want you to* was a well established way of metaphorically representing what the students *should do* in their review. But this reference to having *a quote* was also a node on her initial concept map, and this example represented the first instance of this idea or concept being represented in classroom talk. Later in this class she referenced the summary they were to write when she said, “I want it to be a bibliography on top and you summarize the article, include one quote, and write your opinion. That’s what I want” (APPENDIX D.3).

These *I want* selections continued her semantic projection of the command *do this*, which metaphorically represented her directions as a desire. The teacher however, now included one more part to the summary, your opinion. What *your opinion* entailed exactly was left unexplored, but it seems it could be related to the *evaluation* node on the teacher’s concept map, and might be related to how Steve framed his *take* on the article.

The classroom talk between the initial interviews and the second interviews set out the teacher’s directives and expectations for the summary, and as written earlier, set out an array of choices which the students could choose from to develop their summaries. Looking back to the original concept map we can see that the teacher expounded on summary, tone, diction, figurative language, and quote, and maybe evaluation couched as opinion, in her classroom talk.

#### 4.1.3.1 Steve’s second interview<sup>vii</sup>

This interview happened nine class days after the initial interviews. In Steve’s second interview he was asked about the practice summary he did.

##### *Example 13*

R1     how did you choose what was important to relate or summarize?

S2 I picked out the stuff that stood out to me as something maybe that you would see in a newspaper, like on the front of the newspaper

R3 so let me ask you about that what stood out to you, were they words, were they phrases, were they

S4 things in quotations

R5 oh okay

S6 only used one quote in my take on the article. I one only used one quote cuz I think if you use so many quotes it takes away from the basis of the information. But if you use one it will show there is a foundation for what you are saying and that what you are saying is true

(APPENDIX D.7)

Steve mentioned “things in quotations” (S4) or quotation in his interview, but moved beyond the teacher’s idea of a quote, and understood the idea that *quotation* as a process helped to highlight important information to him as a reader. Quoting could set up “a foundation for what you are saying” (S6). The information was a part of his “take on the article.” *Take* as a colloquial term is used to indicate an opinion or evaluation of something, as in, “what’s your take on the Steelers?” It was possible the inclusion of his *take* in his discussion of summary was influenced by the teacher’s wish to have the students “write your opinion” (APPENDIX D.3 above) in the summary.

Steve extended his logical-semantic understanding of summary by including his take, evaluation, and his use of quotation. He extended his understanding of quote by indicating *why* quotation was important, when he chose *cuz*, *but* and *and* to elaborate how and why using quoted

information might be important. Quoting a source added legitimacy to what he was reviewing. Quoting gave Steve a foundation for his summary.

It was also in example 13 where the verbal process of *saying* the summary became evident as well. Summary needed a foundation, but the summary itself was a verbal or oral summary. The teacher's representation of summary as a verbal process could have influenced his choices here. This example (13) was of interest not just for the above, but also for the fact that Steve had used the idea of quoting as a way to give authority to what you were reviewing. School valued writing often asks that writers support their opinions with outside sources, which help to give justification to the writer's opinions by showing how others too support or think similar to the writer (Wells-Jopling, 2006). Steve's understanding might have derived from the talk referenced in the previous section when the teacher said, "include one quote" (APPENDIX D.3), but without an explicit reference to this moment from Steve it was difficult to link Steve's understanding to that specific moment of classroom talk.

#### **4.1.3.2 Leslie's second interview**

Leslie's second interview focused primarily on the content for her practice summary. She also added one idea to her concept of summary. When asked about what she included in her practice summary she began reciting the events that occurred in the article.

##### *Example 14*

R1     you seem to be summarizing what was occurring and the contrast  
between the things seem to be of a personal nature, and then you brought  
up your brother I believe in the Air Force?

C2     yeah he's in there

R3     yeah, how did you make that connection because we have Ecuador and the Galapagos Islands, and we have brother in the Air Force, which is highly personal, how do those things

C4     uhm, because he is going to be travel a lot, and he is going to be going to some of these places and anything is possible, you know, and normally you know they let him out of the base

(APPENDIX D.8)

This exchange highlighted the example of her brother in her practice summary. This personal example, or what she labeled personal details, became the one node she added to her concept map shown below (Figure 6). Similar to Steve's inclusion of quotation in his interview, there was only the very quick reference by the teacher to putting your *opinion* in your summary (APPENDIX D.3), and this classroom talk was the only talk, which linked the inclusion of a personal relation to the summary. This idea of *personal details* made its way into the concept map as a prominent idea, as I show below.

#### **4.1.4 Students' second Concept maps**

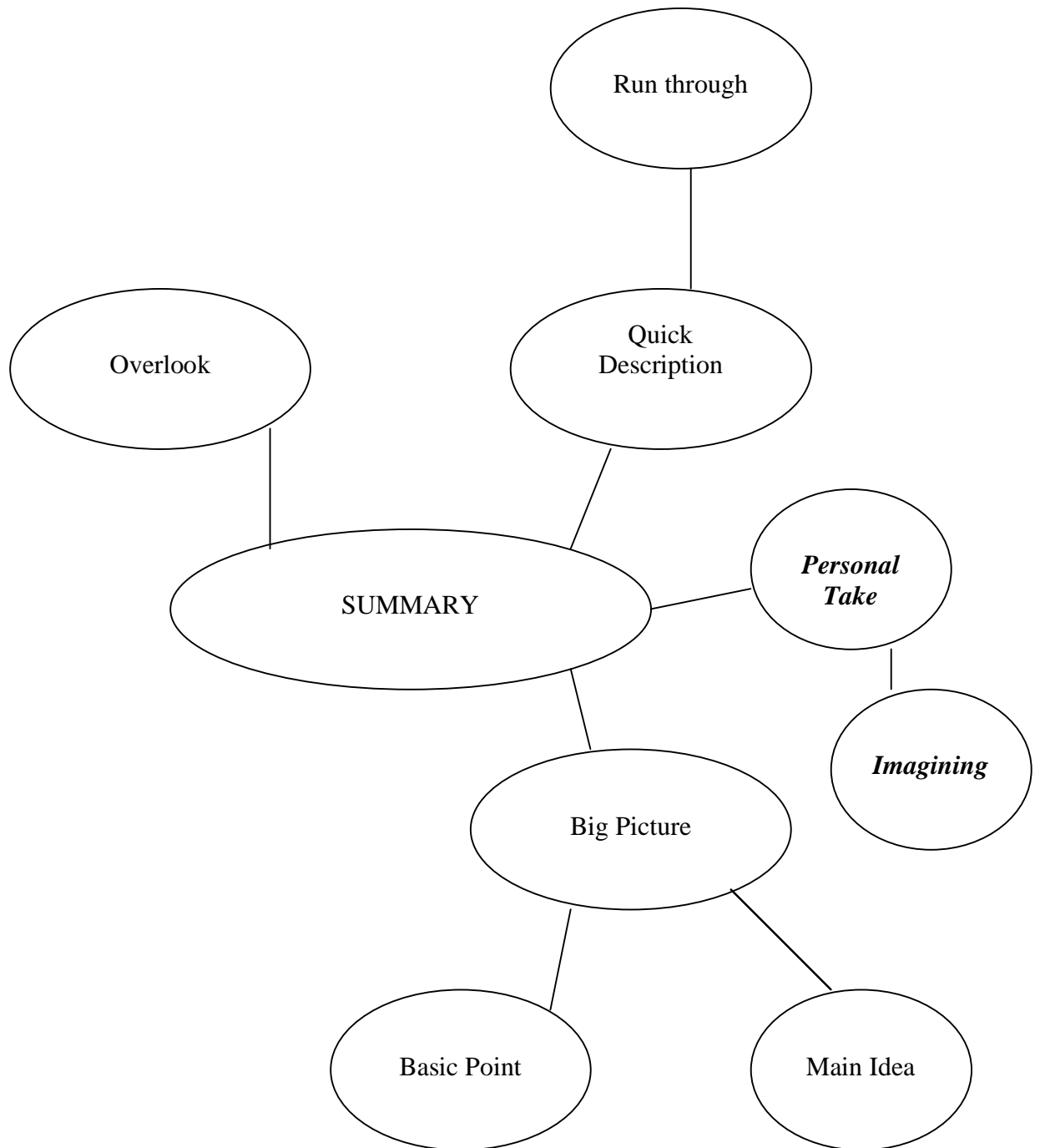
At the end of the second student interview, I showed the concept map that they had completed at the end of the first interview. With a different colored pen to mark possible changes, I asked them how or if they would like to amend the map. They could redo it entirely, add information, subtract information, or leave it as it was. Each student chose to add to their maps. Steve added two nodes, which added two distinct levels, and Leslie added one node, adding one level.



#### **4.1.4.1 Steve's second concept map**

Steve added one node directly off the summary bubble, and then deepened his addition with one more node, serving to add two levels off the word *summary*. Steve added *personal take* directly off *summary* and then added *imagining* directly off *personal take* (Figure 5 below). The interview talk that highlights this addition is below.

Initial interview Drawing  
*Second Interview Drawing*



**Figure 5.** Steve's second concept map

*Example 15*

R1 well, uh, here is your mind bubble, and so I want to ask you would you now change anything, add anything, subtract anything,

S2 uhm, I did this really fast

R3 for me there is not really a right or a wrong, so

S4 so I put another oval under ... and your personal take, and that would be uhm, imagining, I said imagining because when I was reading I imagined myself in the interview with him, hearing what he is saying, so that always makes me connected with the reading

R5 so you would put yourself in the place of the interviewee?

S6 yeah so, like I'm being interviewed, like what I would answer differently or how I would answer the same

(APPENDIX D.7)

He imagined how he would answer the questions, which would help him present his *personal take* (S4) on the questions. His concept map developed a more specific logical-semantic expansion in regards to how summary could be achieved. But summary now needed to be something he could personally relate to, and this personal relation connected him to the reading (S4). Summary also included his evaluation of the reading. He needed to include his take on the reading. Evaluation was also expressed in the teacher's initial concept map (Figure 2) and in a small bit of classroom talk (APPENDIX D.3). Steve's concept of summary changed as evidenced by the additions to the second map. But it is interesting to note that the nodes added, *personal take* and *imagining* had not been referenced specifically in classroom talk. *Personal take* had a small place in the

classroom talk, though it was framed as giving a personal opinion. *Personal take* was not a focal component of review or summary, unlike the idea of *tone* for example, that was the topic of a considerable amount of classroom talk.

#### 4.1.4.2 Leslie's second concept map

Leslie added just one level and one node to her concept map at the end of her second interview. This node, *details-personal*, was directly related to her second interview talk about summary and her production of the practice summary for class. The addition of this level, off the node labeled *facts*, also reflected the teacher's brief comment during her lesson on summary and review writing. When asked about adding or changing her concept map, the following exchange occurred.

##### *Example 16*

R1     so if we look at you concept map and you had, climax, facts, introduction would, you or how would you make changes to this concept?

You can't write, so I will write for you.

L2     I don't know you have like facts are basically everything, uhm, I guess you could be like personal details

R3     where would you put the details?

L4     off facts

R5     so the personal details about the facts?

L6     yeah

R7     so in your thing about the Galapagos islands can you give me an example of the details that you thought were important about the facts?

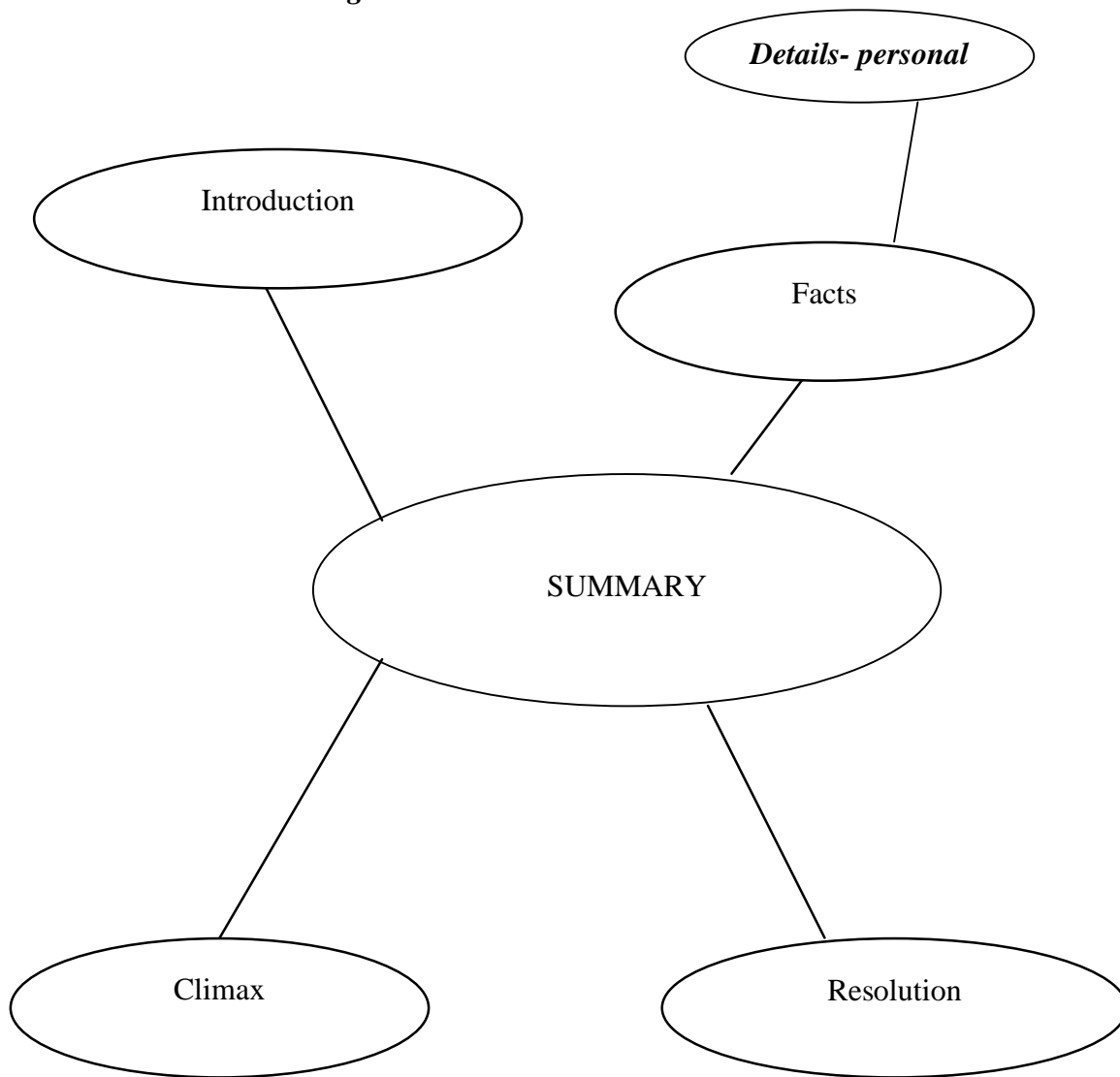
L8 the facts like the president and everything that was involved, like there was a lot of drug activity and communism and everything like that like being in more detail, like they couldn't do anything about it because the government was involved

R9 so you felt detail was relevant to bring up to the students because it was something we could directly contrast to the United States or ... because it was part of our experience?

L9 yeah, I guess

(APPENDIX D.8)

Initial Interview Drawing  
*Second Interview Drawing*



**Figure 6.** Leslie's second concept map

Leslie's concept map revealed a slight change in complexity reflected in her expansion of one node, and the addition of one level to this node. Her logical-semantic expansion of summary in fact, *details-personal* (L2-L4) deepened the idea of *facts* through the inclusion of a specific kind of fact - personal. Between the first and second interview both Steve and Leslie developed

the idea that a person doing summary needed to relate personally to the summary (i.e. imagining) or needed to include a personal connection (i.e. personal take and personal details) to the summary.

Both Leslie and Steve added a personal dimension to the concept to summary, which could highlight Vygotsky's (1978) situating of development as social before individual. We might also posit that this move to the personal was an indicator of the concept of summary becoming a conscious part of the students' conceptual repertoire, which would be an indicator of the development of a scientific concept.

After the lesson on summary had occurred, the participants added very little detail, and few new ideas to their concept maps. Leslie added one node (details-personal) and Steve added just two nodes (personal take, imagining). Both additions, however, added depth to the concept of summary. As I wrote earlier, this section captured and related all of the classroom talk on the concept of summary, and as we will see in the next section, no additional time was spent specifically dealing with the concept of summary prior to the final interviews<sup>viii</sup>, concept maps and final summary task. From the interview evidence and the differences in their concept maps, it appeared at this point in the study that Steve still had a more fully developed understanding of the concept of summary than Leslie.

#### **4.1.5 Students' third interviews/concept maps, and final summary task**

The class days between the second interviews and the final interviews were taken up with the students preparing for their large semester concluding project, which was to be a presentation to the class about an aspect of the community that needed help. Welfare reform, no kill animal shelters, and teen pregnancy were a few of the example topics given to the students by the

teacher. Library visits, teacher meetings and small group work on the project topic took place these days. The class work on the concept of summary that was to occur during this time was to be feedback from the teacher on a rough draft the students did for the book review. The students' rough draft contained the teacher's reactions, and the students were to consult with the teacher if they had questions about her comments. But because the students were not reading the books when the rough drafts were complete, these drafts and the final drafts have been omitted as data.

The final interviews and concept map changes the students did took place after the students' final summary task. In this section, I present the interviews and final changes to the concept map first because I will present and analyze their final summary task in relation to the final concept maps.

#### **4.1.5.1 Steve's final interview**

One of the first questions in the final interview I asked Steve was to recount something he felt was important to put in a summary.

##### *Example 17*

R1     when you were thinking about of the question [the final summary task prompt] that says "summarize" did you have in your mind, gosh I need to include this or I should put in a quote, or was there anything that kinda came to you that [the teacher] has been talking about that you knew you needed to include?

S2     well one of the things [the teacher] made us do was the summary of summary [practice summary], and that's what that is. I didn't use any quotes or anything. ...

R3     did you think quotes were unimportant?



S4 not in this, quotes are important for proving what you think, but they were not important in this case in saying whether you agree or disagree.

R5 okay is it because your personal opinion and not

S6 uhuh, you're not trying to persuade anyone

(APPENDIX D.9)

In this interview, Steve expanded on his understanding of the use of quotations, which he had stated in his second interview (see Example 13), by qualifying that “quotes are important for proving what you think, but they were not important in this case in saying whether you agree or disagree.” In his response, Steve represented the task of summarizing and proving as a verbal process. I chose to highlight this process because when asked to write a response to a question, presented in the final summary task section, the student represented the task as a verbal process.

Steve was also asked in his last interview, similar to Leslie's, the difference between plot and summary, and the following exchange took place.

*Example 18*

R1 is there a difference between plot and summary?

S2 a summary is just an overview of the whole story and the plot is where the story takes place, who the characters are, it may not tell you the troubles the character's have or where the characters have lived

R3 which could be important in a summary?

S4 yeah, and the summary it could go through that, where the characters live, what time period is but the plot just tells you what the time period is

R5 do you think plot is important to incorporate into a summary?

S6 oh yes, you should incorporate the plot into the summary, but  
maybe not the whole summary into the plot

R7 so they are not interchangeable?

S8 no

(APPENDIX D.9)

Similar to Leslie, Steve used the relational process *to be* to identify *summary* as “an overview” and *plot* as “where the story takes place and who the characters are”. Steve also represented *plot* as verbal process of telling to indicate how *plot* relates its information to the hearer of the story. Steve also extended and elaborated on *summary* and *plot* by choosing to juxtapose information with the use of but and the use of relative clause markers, *where* and *who* to specify place and person.

The modality Steve chose to use, may not tell, could go through and should incorporate, similar to Leslie and the teacher’s, represented possibilities and did not fixed definitions, thus making the nature of the concept of summary more tentative.

#### **4.1.5.2 Leslie’s final interview**

The concept of extracting the important or main ideas from a text has been widely cited in the literature on summary as being key to knowing and performing summary well in a school environment (Brown et al., 1979; Gallini & Spires, 1995; Kintsch & van Dijk, 1978; Winograd, 1984). Leslie said in her first interview that “the main idea” (APPENDIX D.6) was important information to include, and so I asked her in the final interview to be more specific about the meaning of *important*.

*Example 19*

R1 how do you know what is important? Really, you made a decision here, how did you make that decision?

L2 well uhm, something like that catches your eye or sparks your attention

R3 okay something that grabs your attention, because it's fantastic or because it's repetitive or

L4 it can be anything, it can be something like, oh my god, or it can be something like [xx]

R5 so it could be one little point just mentioned once and that could be important?

L6 yeah

(APPENDIX D.8)

Her responses of *catches your eye*, *sparks your attention* and *oh my god* all function to frame important information in a text. The lack of specific characteristics to this framing (i.e. *oh my god* is the climax, or a specific kind of word, or image) made these markers of important information (*catches your eye*, etc.) to the concept of summary unclear or unstable. This lack of clarity helped to further the evidence that Leslie's concept of summary was a grouping of diffuse complexes or a spontaneous concept. Interestingly, neither *important information* nor *main idea* ended up on her concept map, but were components to the concept of summary when she spoke about summary.

Because *plot* had been an addition to the teacher's summary and because some classroom talk had centered on the concept of summary, I asked about the difference between plot and

summary in the final interview. When I asked in the final interview, “what are the differences between plot and summary” the following exchange took place.

*Example 20*

L1 the plot is like the main point of the story, like why the person wrote the story, and the summary is like everything the story is basically about, you know what I mean? I don't know how to explain it. Summary doesn't have to include the climax but it doesn't have to be (sic) specific plot in the story, it's like you're telling little details not like you would with the plot

R2 okay which has more detail

L3 yeah, like why, what happened, blah, blah, blah the summary is just a little bit of the plot but not all the details

(APPENDIX D.8)

In the beginning of the exchange, Leslie used the relational process *to be* to relate *plot* to *main point* and *summary* to *everything the story is basically about*. She also chose the word *tell* to talk about the manner in which the summary was to be given. To elaborate on the differences between *plot* and *summary* Leslie chose to use *like* and *but* to elaborate on the definition or difference. *Plot* had more details than *summary* and included “why, what happened” and the very non-technical words of “blah, blah, blah”. *Plot* was also “not all the details”; whereas she used negative modals (polarity, Halliday, 1994) (i.e. *doesn't have to include*, and *doesn't have to be*) to generate possible inclusions for the concept of *summary*, which all worked to add tentative details to the concept.

Leslie framed *summary* by what it *should not be* and these negative examples were realized in the logical-semantic meaning of *the climax* and *the specific plot*, but summary should include only *little details*. This final interview talk illuminated the concept map and Leslie's understanding of the concept of summary in ways that were confusing and contradictory at times. For example, when she said, "summary doesn't have to include the climax" (Example 20, L1), this contradicted what she had put in her initial concept map (see Figure 4). The components (i.e. *climax*) of the summary had unstable relations – i.e., *climax* was and was not a part of summary- to the concept of summary, which showed Leslie's concept of summary to be a spontaneous concept, and particularly a diffuse complex.

#### **4.1.6 Final Concept maps**

Similar to the second time with the concept maps each student was given a different colored pen and asked whether they wanted to add or subtract information. They also had the choices of leaving it alone, or redoing it entirely. Similar to the second concept map session students made small changes to their maps.

##### **4.1.6.1 Steve's final concept map**

Steve added a new level directly connected to summary, which he entitled *light plotting*, and Example 21 sets out what Steve described as *light plotting*.

###### *Example 21*

that's basically what a summary is, you're just going through light plot of what the characters are, of the time setting. Like if you did a summary of the *Wizard of Oz*, you would say "a young girl named Dorothy goes

through a ..., but in a plot you would say, “Dorothy lives in Kansas, in a small house in Kansas with her aunt and uncle, where in a summary you might not mention that she lives in Kansas or you might not mention she lives in a small house ... cuz in a summary I think it is important to just sum it all up and not give away too much, where the plot would give away everything

(APPENDIX D.9)

The relational process *to be* identified *light plotting* as equitable to *summary*. The interpersonal grammatical metaphors, expressed through would, might and I think semantically project a hypothetical position and tentative positions, but metaphorically represent possibilities for what could be included in the summary. The elaboration of the concept through the use of like for exemplification set out small details (i.e. living in Kansas or living in a small house) as unimportant to summary because the details provide too much information. We are left to wonder what type of information was specifically considered too much.

Initial interview Drawing  
*Second Interview Drawing*  
Final Interview Drawing

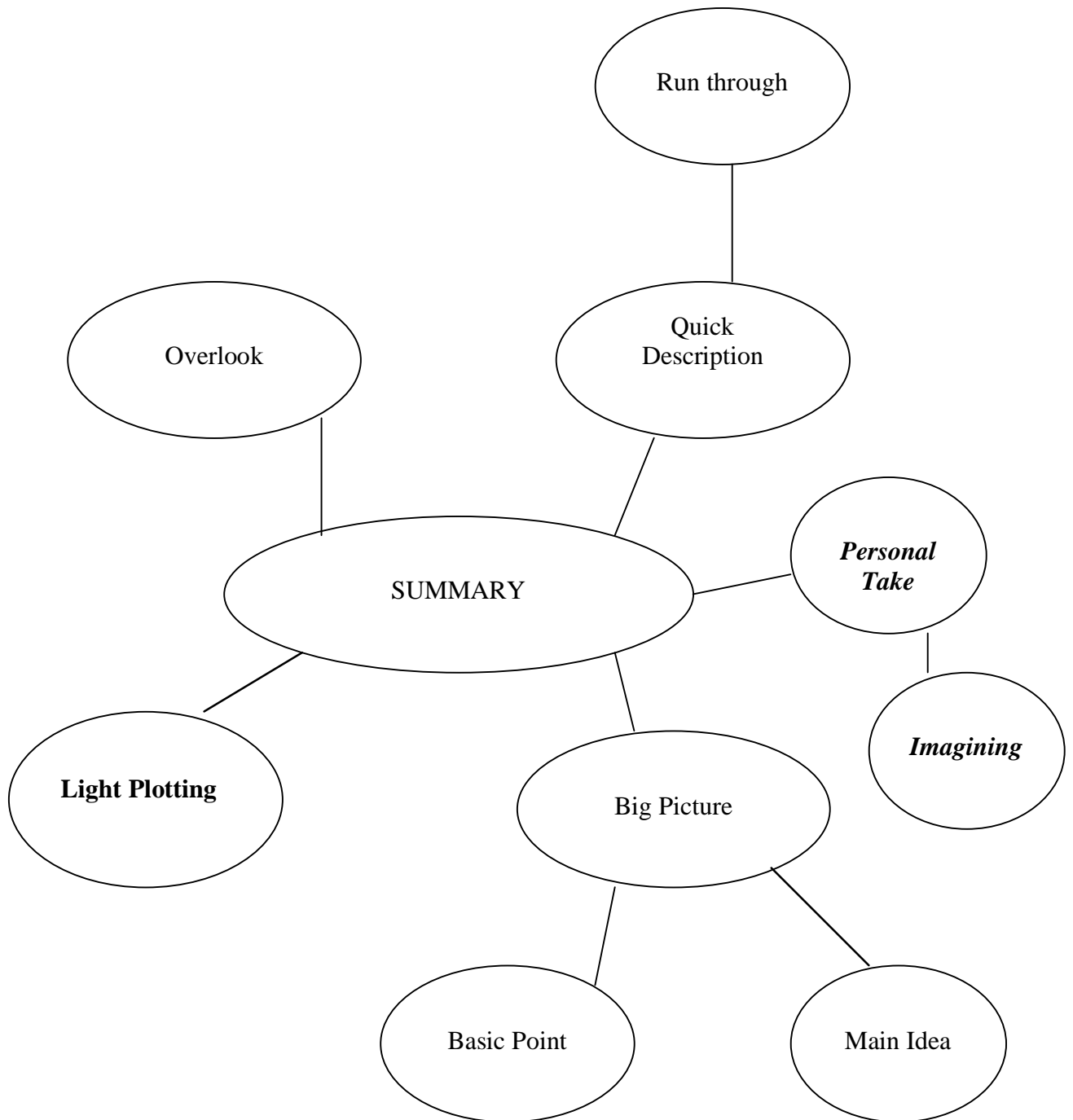


Figure 7. Steve's third concept map

#### 4.1.6.2 Leslie's final concept map

In Leslie's addition to her concept map, she explained that *details* need to be added off the node of *resolution*.

##### *Example 22*

R1 this is our last time with the map, is there anything you would like to change or add or subtract

L2 probably put more detail in the resolution, summary, no uhm, *reading her work* I don't know

R3 okay how about, what do you mean by details?

L4 like resolution, they want maybe more details, like what happened, where did they go, what did they do, not just they lived happily ever after

R5 okay so more specifics

L6 yeah

R7 would you do anything else

L8 I don't know, I don't know

(APPENDIX D.10)

The exemplification realized through the use of *like* (L4) mirrored her talk in the earlier part of the interview (Example 20), when she was asked to state the difference between plot and summary, and she indicated summary needed "little details". *Details* in this example were the specific details you found in the resolution of the piece you were reading. For example, you would include whether "they lived happily ever after" (L4). This aspect of novels and the idea of a resolution tend to occur in narrative pieces of work, such as the novels they were supposed to



be reading. You would not expect to find resolution in the genres of news articles, or magazine essays. So, her inclusion of this *details* seemed to be contextually bound to a story genre.

A part of example 22 that was interesting and was said during the concept map part of the interview, was Leslie's use of "I don't know." She could have been possibly engaged in self-talk about possibilities, but because her tone and manner displayed exasperation with a reply I think she really did not know what to do. It was possible that she was expressing exasperation with my questions, but her first interview stated a similar sentiment.

*Example 23*

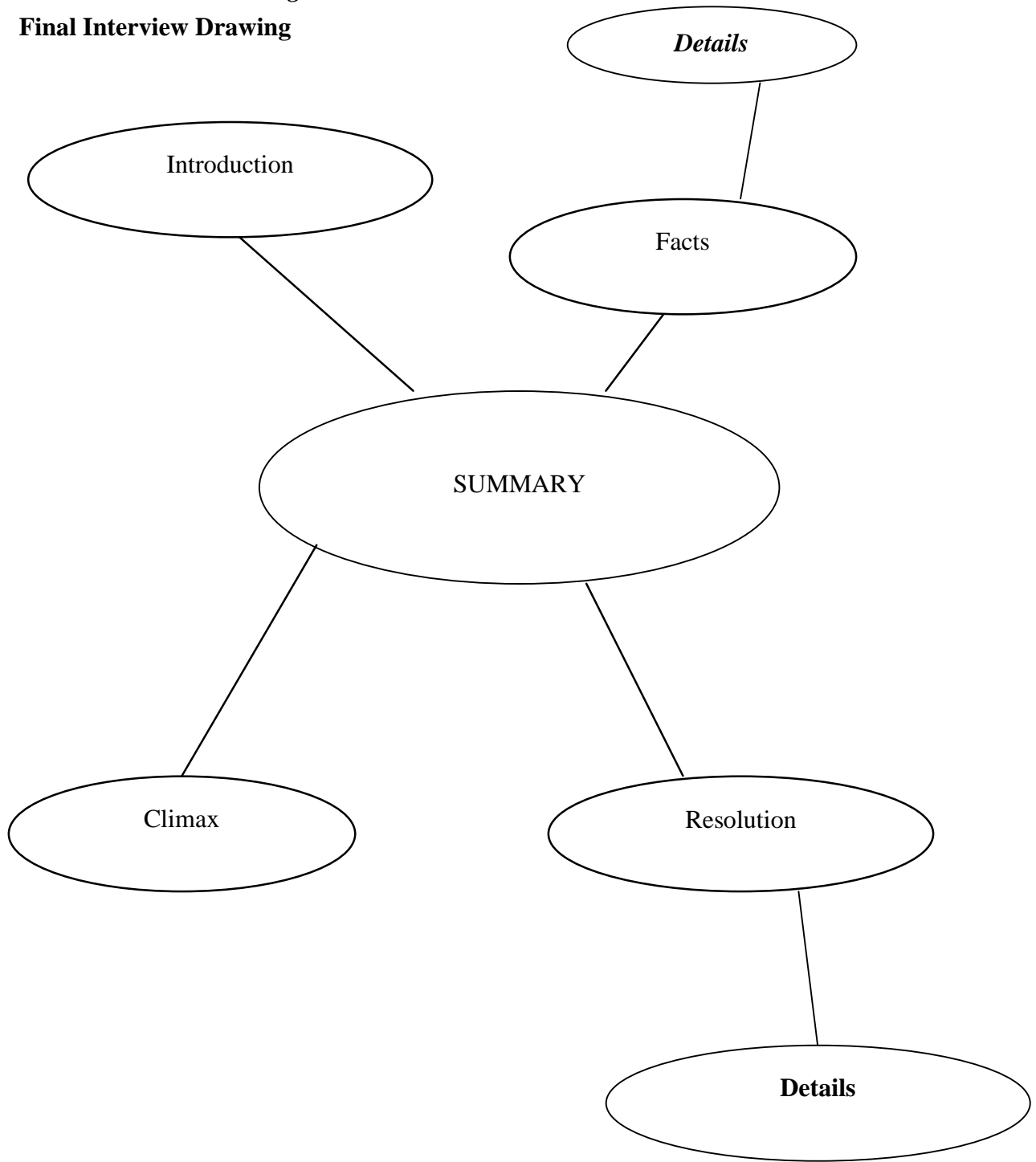
R1     so are you enjoying the class?

L2     It's not bad. Kinda confusing though.

(APPENDIX D.6)

This confusion might have been manifesting itself in her statements, "I don't know." And could be one reason her concept of summary was less developed than Steve's both at the beginning of the unit and as a result of the instruction.

Initial Interview Drawing  
*Second Interview Drawing*  
Final Interview Drawing



**Figure 8.** Leslie's third concept map

In the final interview, each student added only one node to their maps, and seemed to narrow the context of summary to narrative contexts (i.e. Wizard of Oz and happily ever after). When comparing the final maps of the students with the first map of the teacher (Figure 2), it seemed the students were still developing towards the concept held by the teacher. Certainly neither the dialogical nature of the teacher's map nor the complexities were represented on the students' maps. But as will be shown below, some overlap was found in the concept maps between the teacher and students. This overlap indicated the students' awareness of the concept of summary was developing towards the teacher's concept, and the students' work in class, or possibly their interaction with me, affected their understanding of the concept of summary.

#### **4.1.7 Final summary task**

The final summary task was an activity to help illuminate to what degree the students could summarize consciously and purposefully in the context of a novel task. The task also provided evidence for the ideas and concepts in the students' interviews and in the concept maps.

The final summary task was to write a response to the following prompt. I wrote the prompt, based on an essay by Alexander Calandra entitled, *Angels on a Pin* (Appendix E).

Please summarize the following short story, and explain to what extent you agree or disagree with the student's opinion about school instructors and how they instruct.

The following two sections, respectively, were Steve and Leslie's responses to the final developmental activity.

#### 4.1.7.1 Leslie's final summary task

01 This is about a boy who is given a test question about how tall a  
02 building is for physics class. Although the boy doesn't answer the  
03 question properly, he argus (sic) that his answer is correct and should  
04 get full credit. I agree with the student teachers always want you to use  
05 scientific methods that you will never use in your life. Although some  
06 people might use them in my opinion some things we learn are  
07 absolutely pointless.

Leslie's summary was very linear in its representation of the essay. She began by referencing the student in the story as "boy" and identified the location and the task that were central to the essay (01-02), "physics class" and "a test question." She identified one of the main ideas in the article (that he received no credit for his test answer) (02-04). She expressed her personal take or opinion about the physics student in the story, when she said "I agree with the student" (04). She also agreed with the student in the story, as he too felt "some things we learn are absolutely pointless" (06-07).

Leslie's final summary task was not as lexically dense as Steve's final summary task, as I will show below, but Leslie's was more successful as *summary* than Steve's final summary task. If summary's success depends on being able to relate a text's main ideas, to evaluate the text, and to omit unimportant information, as the teacher and the literature suggest, then Leslie's summary was a success. One could read her summary and describe, albeit sparsely, what the text was about, who was involved, and where the story took place.

#### 4.1.7.2 Steve's final summary task

Steve's final summary task was less successful than Leslie's, yet it was more lexically dense, and had more technical language in the summary.

01 Instructing a(sic) academic classroom can be monotonous, and have  
02 great effects on the students learning. By allowing students to solve  
03 their own question by logic, rather than a scientific method, you allow  
04 them to indulge inside their own thoughts, and their own answers to the  
05 question. Of course, it's easier for a teacher to explain scientific  
06 method of a specific subject, but it may be easier to "get through" to  
07 her/his students by using logical discussion upon how this question  
08 could be answered. I agree with the students(sic) theory, upon which  
09 may not have yet been proven, but it is still easier to use plain logic,  
10 than science answering life's day-to-day questions.

Steve's summary did not recount the story in any specific detail. He related a feeling the student in the story might have felt, "a [sic] academic classroom can be monotonous" (01). The student in the story was tired of the type of teaching he encountered in classroom, but this was not the "instructing" (01) that Steve started the final summary task with. Instructing was from the perspective of the teacher, and was not from the perspective of the student in the story. The "logical discussion" referenced in line 03, and explicitly stated in line 07, were not situated in the story. The student of the story was concerned with the mundane, and unchallenging approaches teachers used to understand what students knew about subjects. Discussion as a tool, or something a student could "use" (07), was not addressed in *Angels on a Pin*. Steve's summary

also stated his opinion, “I agree” (08), and his suggested remedies to monotonous classrooms (02-05) and were indicators of his *personal take* (see Figure 5).

While there were phrases which were hard to parse, “upon which may not have yet been proven” (08-09) and “indulge inside their own thoughts” (04), the gist of the story was stated in lines 01-05. Steve accurately depicted the student’s view of the classroom as “monotonous” (01), and accurately understood the student’s novel responses to the question as allowing the student to think for himself (02-05). Steve, similar to Leslie, did give his opinion, and was not as linear in his recount as Leslie was.

Steve’s summary also had the following characteristics: 1) Steve’s final summary task was more lexically dense ( $55/6=8.36$ ) than Leslie’s ( $33/9= 3.6$ ); 2) Steve was also able to include more technical language choices - “scientific method” and “theory” in ways that deepened meaning within the summary.

Ultimately what the final summary task was designed to do was to present a novel task to the students to see to what degree they could consciously use the concept of summary. This can be better understood if we examine to what extent their final or cumulative concept of summary mapped onto their final summary task.

#### **4.1.8 Cumulative concept maps and the concept of summary**

In order to apply their concept of summary to the written tasks, I first had to understand what their concept of summary entailed. To do this, I created a cumulative concept map. This concept map combined their final concept maps, as represented in the section prior to this one, to the ideas or concepts they *talked* about in their interviews<sup>ix</sup> as being important to the concept of summary.

For example, when I asked Steve what he thought summary was, he replied, “an overall grasp” (Example 5). So, for the above example, when Steve used “overall grasp,” it was an idea which developed the logical-semantic relationship to summary, thus *overall grasp* became a node directly extending from the word summary on the cumulative concept map. The students’ cumulative concept maps follow.

Final mind map + Classroom and interview talk

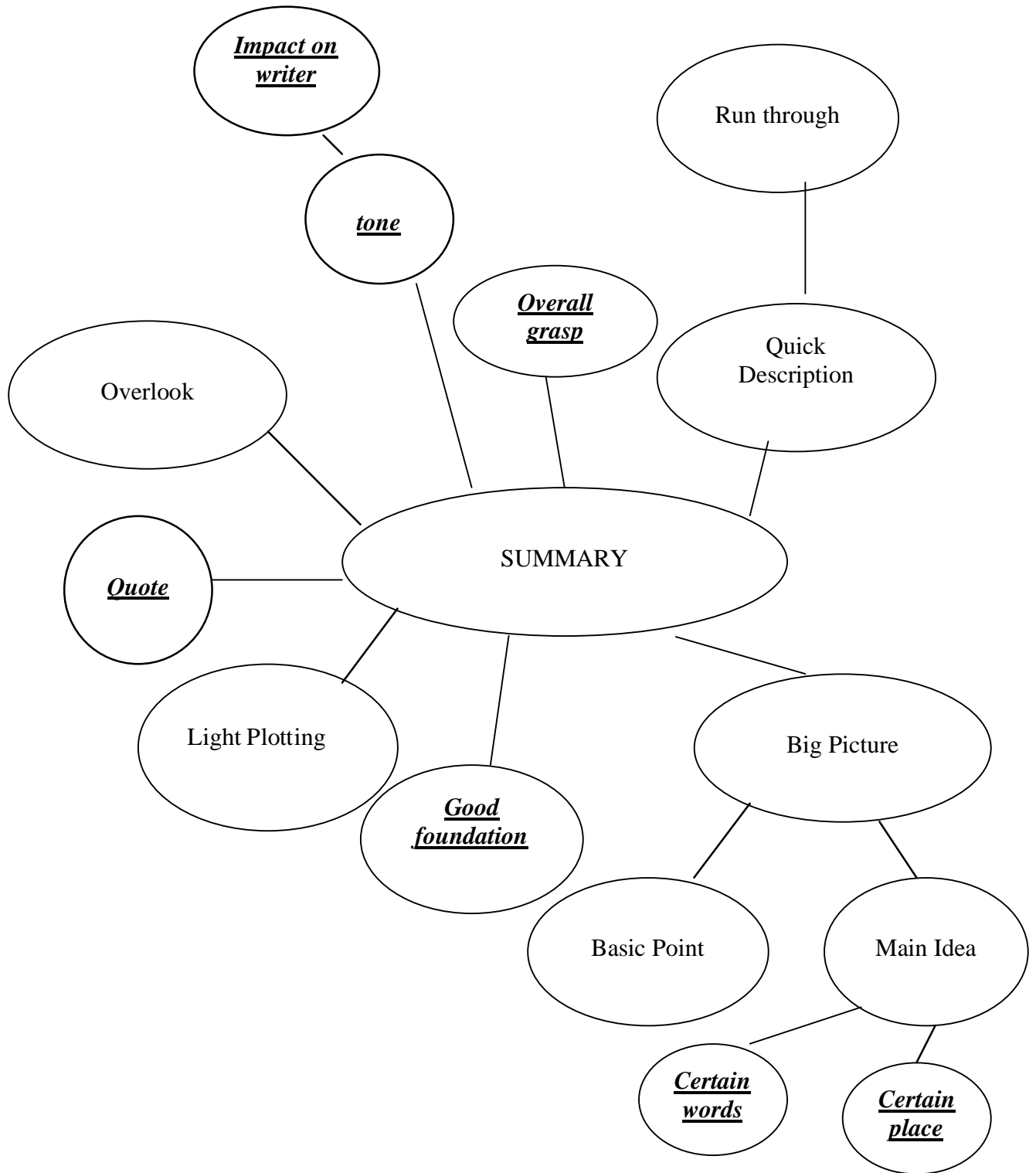


Figure 9. Steve's cumulative concept map



Final mind map + Classroom talk and interviews

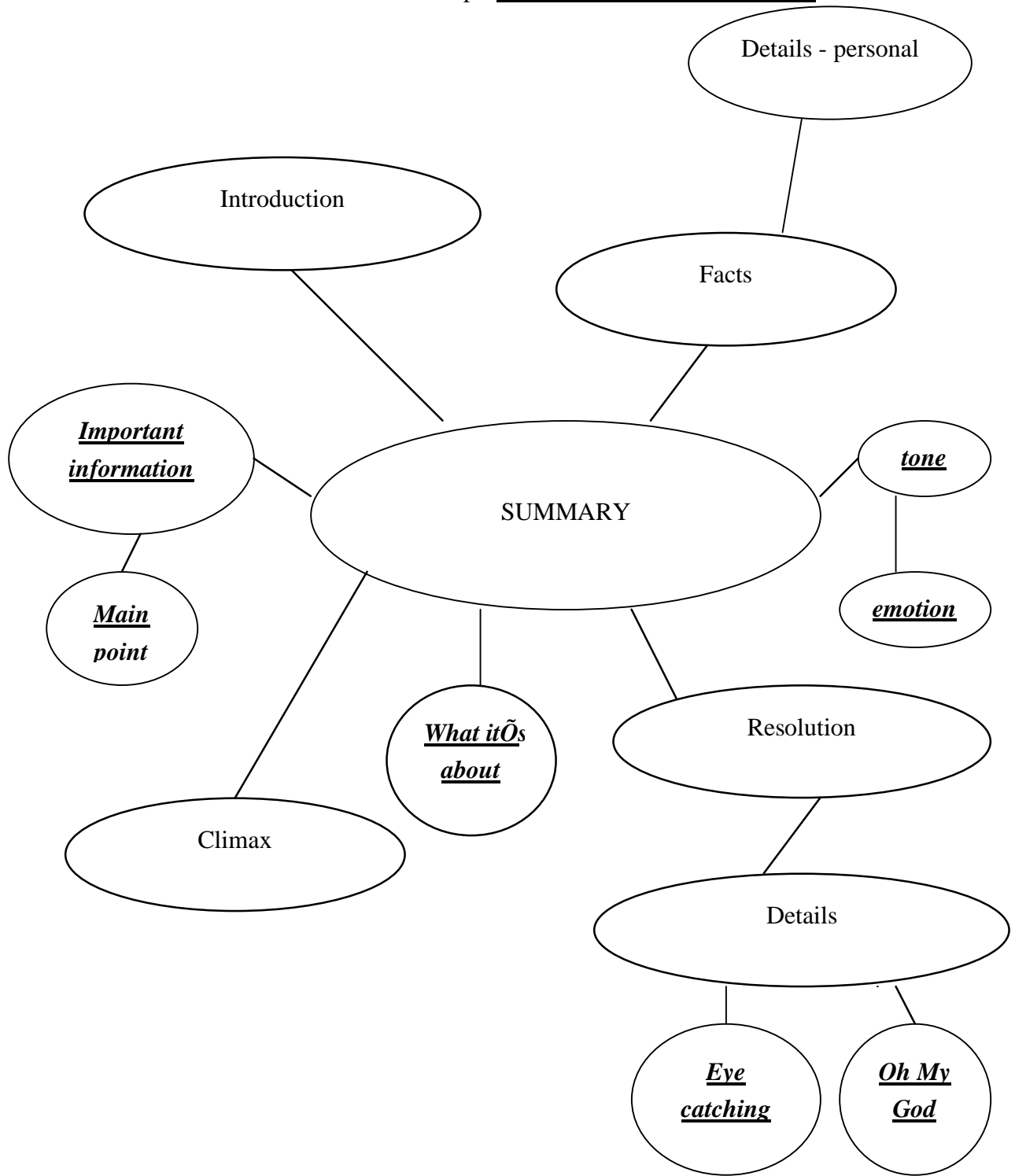


Figure 10. Leslie's cumulative concept map

Steve's final summary task represented the *personal take* node of his cumulative concept map, when he wrote "I agree with the students (sic) theory ..." (08). And he also established some aspect of *tone* by using technical vocabulary, (i.e. scientific method, theory). But because much of what occurred in his summary simply was his opinion, it was difficult to consider this final summary task, which corresponded to two nodes on his cumulative concept map, a representation of the summary genre. Though his *take* and his establishment of *tone* were explicitly stated by the teacher as being important to the concept of summary, and for this reason Steve was more engaged with local context of summary as presented by the teacher.

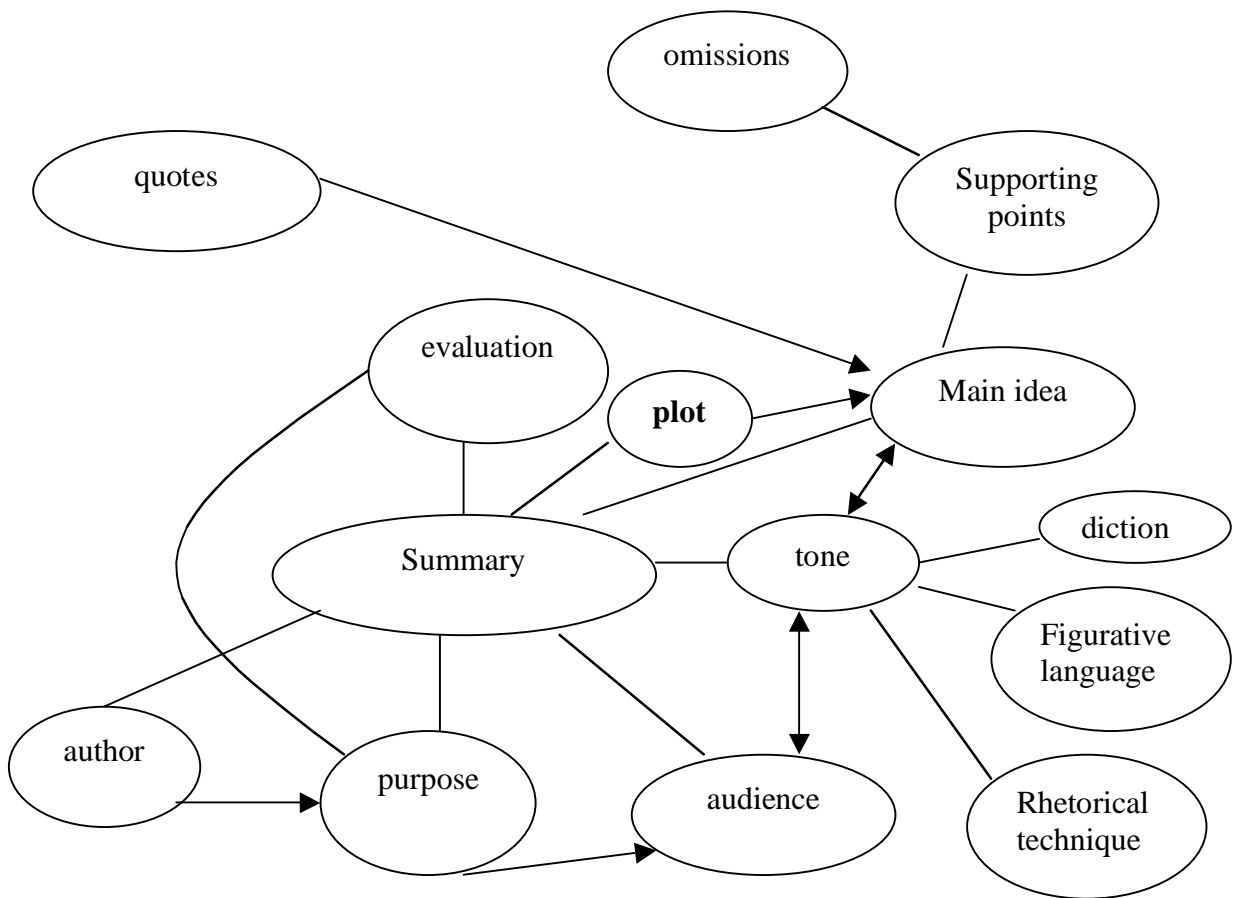
Leslie, on the other hand, put forth a summary that represented her map. She gave a brief *introduction* (01-02). She gave *facts* (02-04) and some personal details by her inclusion of "we" in line (06). The use of "we" allowed her to be included as someone who learns pointless things in the classroom (07). She also represented *resolution*, which was found in lines 04 and 05. Her statement that "teachers always want you to use scientific methods that you will never use in your life" (04-05) connected to the story's final scene between the student and the teacher, who was asked to check the student's work. The student at the end of the essay expressed his dismay at the fact that teachers tested him on what the teachers wanted him to know, and not on his own ability to solve problems.

The students produced a novel summary task, though Leslie's represented the concept of summary in a manner that might be more recognized outside of the local context of this class as summary compared to Steve's summary. However, as was stated above Steve's rather infelicitous summary task had attributes the teacher had addressed in class. Steve was also seemingly trying to construct a *macroposition* about the reading. However, neither student

represented the final summary task with the entire concept of summary as depicted on their cumulative concept maps.

#### 4.1.9 Shared concepts of summary

The final piece to this analysis is to show to what degree the students' concept of summary overlaps with the teacher's concept of summary. Below I present the teacher's final concept of summary as was depicted after our third interview<sup>x</sup>.



**Figure 11.** Teacher's final concept map

The teacher’s final concept map helps set up the overlap between the students’ concept of summary and the teacher’s concept of summary. The following table represents the characteristics of summary that the students have in common with the teacher and each other.

**Table 2.** Shared concepts about summary

| Teacher’s concept   | Steve’s concept | Leslie’s concept  |
|---------------------|-----------------|-------------------|
| Summary             | Summary         | Summary           |
| Evaluation          | Personal take   |                   |
| Quotes              | Quotes          |                   |
| Plot                | Light plotting  |                   |
| Figurative language | Certain words   | OMG, eye catching |
| Main idea           | Main idea       | Main point        |
| Tone                | Tone            | Tone              |

As the table shows, Steve had more in common with the teacher’s concept of summary than did Leslie. What this represented was that over the course of the unit and through the talk with the teacher, and researcher, Steve was able to develop a concept of summary more representative of the teacher’s concept of summary than Leslie’s concept of summary. Even though Steve’s concept was represented in talk as having more in common with the teacher, the final summary task showed that Leslie presented a clearer and more detailed summary than did Steve. Steve exhibited one of the overlapping components in common with the teacher, and that was his *personal take* on the story *Angels on a Pin*; whereas, Leslie exhibited *main point*, which overlapped with the teacher’s concept of summary.

It would seem from the evidence above that it is not as important to have a large number of components of a concept in common with the teacher, but it is more important *which* components you have in common with the teacher's concept. Not all components of a concept are created equally.

## 4.2 FINDINGS FOR RESEARCH QUESTIONS

The above data answer to a great degree the third research question; What evidence do the two students present to indicate that they have developed (e.g. complexity, etc.) the valued scientific concept(s)? There was ample evidence presented that the students developed a more complex understanding of the concept of summary, albeit a more complex spontaneous concept. Their discussions with me, the concept maps they drew and the final summary task all demonstrated their development towards the scientific concept of summary. The change from their initial interview and concept map to the cumulative concept map showed the students developed *towards* a scientific concept of summary as defined in this study by the teacher's concept of summary.

Research question two of this study was; How does the students' talk demonstrate the dynamic interplay between spontaneous and scientific concepts? I would argue that the students had a developing spontaneous concept of summary as they entered the class and the research project, but certainly the concept had been addressed in school prior to my study. This interpretation seems evident based on the fact that the concept of summary as it was used in schooling was not a novel or new word for the students. They both answered questions about the importance of summary, and neither student questioned me as to the meaning of summary. But

the students' interview talk supported a diffuse complex or a type of spontaneous concept of summary. The students showed they were unsure of how all the components of the concept worked in unison to form the concept of summary. The students had various components they attached to the concept of summary, but seemed unable or unwilling to enact those components in the final summary task. This failure to enact suggests the component connections to summary were unstable. For example, the students were unsure about how to represent *tone* or *evaluation* in their summary in a clear fashion.

The first research question was: how does the teacher's talk support the transformation of spontaneous concepts to scientific concepts development in two students? The teacher's classroom talk, along with the researcher's interview talk, with the students supported a transformation in their spontaneous concept of summary. There was evidence of her talk supporting the transformation when we consider the overlap the students' concept of summary had with the teacher's as shown in the table 1.1. The students' concept of summary changed, and some of the change seemed to be directly related to the teacher's lessons on the concept of summary. The part of the question that asked *how the teacher's talk supported the transformation* is more difficult to answer because we saw that there was confusion in the teacher's own concept of summary (e.g. review is a different kind of summary), and at least one student, Leslie, admitted to being confused.

The teacher's repeated use of verbal processes to indicate a written product certainly could have created confusion for the students. The teacher's orientation to a written task as a spoken genre was also revealed in the students' comments. Additionally, the interpersonal metaphors did not clearly define the concept of summary, but rather gave the students permission to decide what was important to include in summary rendering the task open-ended and free

from the requirements of conforming to the criteria of the teacher's valued concept of summary. This freedom in the task might have impeded the development of the concept of summary. The teacher's use of non-technical everyday language to exemplify the concept of summary could have confused the students concerning the teacher's concept of summary. But it is difficult to evaluate to what degree the teacher's language use, when presenting the concept, hindered or helped the students' development.

One clear finding is that final cumulative concept map is an example of a developing spontaneous concept for the students and as a scientific concept for the teacher.

A real concept is an image of an objective thing in its complexity. Only when we recognize the thing in all its connection and relation, only when this diversity is synthesized in a word, in an integral image through a multitude of determinations, do we develop a concept.

(Vygotsky, 1998, p. 3)

The tools for analysis were appropriate for the task and allowed the development of the concept to be tracked over time and across the curricular unit. The concept maps, or graphic organizers, allowed me to present concrete and material representations of concepts that could then be compared and analyzed. These representations then can be used to examine a novel task, the final summary task in this case, which might allow us to make claims about the concepts portability and application to novel situations.

### 4.3 CONCLUSION

The final research question, does scientific concept development occur in this unit, is addressed below.

For both students, if we look across the time of the developing concept of summary, we can see the concept of summary transform beyond its initial iteration as indicated in the first concept map. This development suggests that the concept is spiraling along a path of development for both students but at different rates and along different routes. As shown, Leslie's spontaneous concept of summary differed from Steve's spontaneous concept, although both students developed toward a more scientific understanding of the concept in the final analysis.

Both these students used language as a tool (Vygotsky, 1987) for grappling with the developing concept of summary. Leslie's understanding of summary showed an "establishment of relationships," (i.e. one, four part summary for all genres), which had "different concrete impressions" (p. 135) and thus show a developing *complex* of summary. And while the complex did have logical unity, it ultimately was very concrete and factual (Vygotsky, 1997); whereas, Steve's conceptual components were more abstract and complex, which are both indicators of a developing scientific concept (Vygotsky, 1997). Steve also demonstrated that he could generalize and differentiate the concept of summary with other concepts as he did when he talked about the differences between the concepts *plot* and *summary*.

But Steve's final product can also be seen as an instance of a student grappling to abstract the concept of summary to a new situation (Vygotsky, 1987, 1997). Leslie's use of the concept of summary in a novel situation was a linear and somewhat formulaic concept of summary as outlined in the literature and by the teacher. The greater complexity of Steve's concept and his



enactment of the parts of summary valued in the local level (e.g. the teacher) and the enactment of Leslie's somewhat simplistic concept suggest that the students are developing the concept along different routes towards the scientific concept of summary. We may conclude based on the evidence presented in this study that the teacher's unit on summary did not produce a fully formed scientific concept for the students, but created the conditions for the development of the concept of summary toward a more scientific, systematic, and hierarchical understanding of this complex concept.

## 5.0 CONCLUSION

### 5.1.1 Introduction

The goal of this study was to examine how discursive mediation during instruction of summary by a teacher positively influenced the transformation of spontaneous concepts to scientific concepts of summary in students. The mediation provided by the teacher in the classroom affected concept development in her students to a degree. Both students developed a more complex understanding of the concept of summary over the course of this study. Both students added ideas to their initial spontaneous concept of summary, which were found in the teacher's concept of summary (i.e. tone, figurative language, main idea).

Simply adding ideas to the concept of summary is not sufficient to develop the scientific concept of summary. What needs to occur for the development of the scientific concept is the students must be able to generalize the concept across contexts, and consciously use the concept in novel situations. The students in this study were able to change their concept of summary, but were not able to generalize, nor consciously and successfully use the concept in the novel final summary task.

What occurs during and through the process of developing the scientific concept is not just a change in the web of relations or the logical connection of the concept. Using scientific concepts is fundamentally a different way of *thinking*. This is why scientific concept

development is important in schooling. Having summary as a diffuse complex (Vygotsky, 1997) means the separate components of the concept are understood, but the attributes that connect the components are unstable or unknown. In many ways, the students in this study had this type of spontaneous concept. The students could speak and even map out the separate components of the concept, but could not *do* or *enact* “the staged, goal oriented process” (Martin, 1984, p. 25) of summary. In other words, the genre of summary, as evidenced by their final summary tasks, was still elusive for the students. The students were not able to connect the components they understood to be the parts of summary to a self-regulated, conscious and purposeful task of summary. Neither Leslie nor Steve actually produced a summary that reflected the elements of the concept as it was presented to them by the teacher.

Arguing why they cannot do something takes us away from what we know occurred in the class and trying to understand what these occurrences meant for the development of the concept of summary. The teacher and the students described the concept of summary by using oral processes (i.e. say or talk) to explain when or how summary was used. The teacher’s focus remained on the dialogic attributes of summary where oral constructs were used to explain summary. The teacher used grammatical metaphors (i.e. interpersonal metaphors) to set out a weak purpose for two components of a summary and what a summary must accomplish. At one point, the teacher’s classroom talk equated the concept of book review to the concept of a different kind of summary, which only served to confuse these two concepts.

Based on the teacher’s interview talk, her Concept map (see Figure 2), and that her concept of summary had many of the features the literature has argued is important of the concept of summary, I can write that the teacher had a scientific concept of summary. The teacher’s talk and initial map show the concept of summary to be a complex set of relations with

ideas such as *evaluation*, *audience*, *purpose* and *language* being important first components to the summary. These first components, as seen on her initial Concept map, also have a multitude of relations as evidenced by the levels that build off the nodes, but also evidenced by the dialogic nature of how the teacher envisioned the components interacting with each other. For example, the author fed (shown by an arrow) into the purpose, and the purpose fed into the audience, and then the audience dictated the tone of the piece. These multitudes of determinations and complex relations were represented in an “integral image” (Vygotsky, 1997, p.3) of the word *summary*.

Summary for the teacher though also represented a number of the aspects the literature revealed as important to summary. In chapter two, it was stated that summary needed to have the main ideas from a text (Brown et al., 1983; Kintsch & van Dijk, 1978), which meant the writer doing the summary had to omit unimportant information as well as include important information. These *omissions* were a part of the teacher’s concept of summary as well as the ideas of *plot* and *main idea*. For some researchers (Gallini & Spires, 1995; Kintsch, 1990) a summary needs to take a *macroposition* on the text, and a summary needs to form theories about the text it is summarizing. These concepts were represented in the teacher’s concept map as *evaluation*, which was said in the teacher’s first interview, to be a key goal for the students. The students had to understand why the text was written, or understand what the text was responding to, and then the students had to form a position, a theory as it were, on the text. The teacher’s concept of summary as evidenced by her interview talk, concept map and her alignment with research on summary all indicated she had a scientific concept of summary.

Each student demonstrated certain aspects of the teacher-valued concept of summary (i.e. giving specific facts or evaluating the text’s argument), through interview talk and the final

summary task as outlined in chapter four and as seen in Table 1.1, but neither student demonstrated the scientific concept of summary as presented by the teacher.

Similar to the teacher, Leslie was concerned with the facts of the text and her personal reaction to the text (i.e. facts and details-personal, see Figure 10) and these concerns were demonstrated in her final summary task. Steve's concept of summary (see Figure 9) also had the teacher valued ideas of *tone*, *main idea*, and *language* and was more complex than Leslie's if we consider the complexity and the number of ideas or concepts related to the concept of summary. And while his final summary task had more features of academic writing (i.e. was more lexically dense and had more technical language), though it contained no specific references to the story (i.e. the plot or the characters) and was mostly personal reaction or how the story impacted him (see Figure 9, *tone* and *impact on writer*).

## **5.2 VYGOTSKY AND THE PROCESS OF CONCEPT DEVELOPMENT**

Concept development is not merely “the simple maturation of elementary intellectual functions”, but is a fundamental change in the “internal, intimate, structural nature” (Vygotsky, 1998, p. 38) of the adolescent. The semiotic tools, or most notably words, used to develop an internal structural change, and thus higher mental functions, must be mediated by language that is specific and technically relevant to the concepts being developed. When non-technical, congruent, and everyday language is used, as was often the case with the teacher's examples, then the students have little structure on which they can build the scientific concepts needed to succeed in schooling.

The students were shown to have developed beyond the initial spontaneous concepts they had of the word summary. And while one could argue that neither student had a wholly spontaneous concept of summary, given the years they have been in school, neither had they the developed scientific concept of summary. Vygotsky (1997) said,

The key difference in the psychological nature of these two kinds of concepts [spontaneous and scientific] is a function of the presence or absence of a system. Concepts stand in a different relationship to the object when they exist outside a system than when they enter one. (p. 234)

The system a scientific concept enters allows the concept to be generalizable with other objects. The relationship the students had with the concept of summary was one bound by context (i.e. reading for Leslie, see Example 5 and Steve, see Example 6 or speaking for Steve, Example 12), and was a spontaneous concept bound by the context of the assignment they were asked to complete. The spontaneous concept was factual and concrete, and not yet abstract and logical as Vygotsky argued was necessary for a scientific concept. As a moderate realist (Langford, 2005) Vygotsky argued the word represented a component of the material world and was representative of a cognitive orientation to this world. The students in this study needed to develop a relationship between summary and book review, as concepts, and then be able to generalize summary to other genres to show a scientific concept. In this study, book review did not become the object to which summary was directed. Book review became *integrated* into the system of the concept of summary.

The relationship established between summary and book review became a closed system, where generalizability became hampered by this unclear relationship. The relationship between concept and the object toward which the concept is directed is needed to give the students a tool,

the tool of being able to generalize a concept to other objects, which could be generalized to other written and spoken genres in the ELA classroom or other content classrooms. The explicit orientation between concept and object helps to make the act of schooling more transparent and attainable for students across the school contexts.

### **5.3 SCHOOLING AND LANGUAGE**

Being explicit about language as a concept in learning and as an object of study has been a focal point in educational research for systemic linguists (Achugar & Colombi, 2007; Christie, 1999; Gibbons, 2003; Mohan & Beckett, 2003; Schleppegrell, 2004), as well as educational researchers from a Sociocultural perspective (Bourne, 2003; Hicks, 1995-1996; Lee, 2006; Moss, 2002; Smagorinsky, 1998). Being explicit about language as a concept and as an object means thinking of a linguistic repertoire as a meaning making system and of language users as meaning makers who make choices from what the system/culture affords. The teacher was aware of the importance of explicitly focusing on the concept of summary as evidenced by her reference to the concept in classroom talk, and as was stated earlier, the teacher had a scientific concept of summary on which to base her classroom work. In this study, the students each had as a part of their concept of summary the idea that language use mattered to either their formations of summary. For Leslie, a word(s), which “catches your eye or sparks your attention” or that is “oh my god”, is important to a reading and thus could be important to summary (Example 18). For Steve, certain words “in one line” or even singular words could be indicators of important information, which you could include in summary (Example 6). For the students, language as a concept or an idea was a part of summary.

For the teacher, *tone* was comprised of the concepts of *diction*, and *figurative language* as important to summary and language (i.e. hyperbole – Example 11, or figurative language – Example 10) as part of the process, or the metalanguage of summary, was important for the teacher. The teacher wanted the students to understand language use as important to the concept of summary thus making language the object of study. So to a degree, language was both concept and object in her work with and understanding of the concept of summary. Therefore, she partially participated in the system Vygotsky wrote about as key for scientific concept development.

The language that the teacher used to construct and develop a teaching and learning relationship became, I believe, an important part of the development of the concept. The teacher, as I discuss later, is the agent that should aid in the students' development of a school-valued language. In this study, the teacher's use of congruent and everyday language, or her register choices, though failed to help the students bridge their language use to the scientific concept. The teacher's classroom examples of summary, which centered on the everyday language of "banging his wife" (Example 9) and the "child with flies in his eyes" (Example 10) served to illustrate the concept of summary with congruent and everyday language. These examples, as a part of the teacher's pedagogical approach, help establish the teaching and learning relationship as one where everyday and congruent language are valued. However, in order to develop the scientific concept of summary, students need to move beyond congruent language and experience more incongruent language use. Language as the concept and object of focus in the development of the concept of summary needs to be used and exemplified by the teacher with the students in ways that develop the scientific concept of summary.



Basil Bernstein (Bernstein, 1990, 1999) argued school to be the place where the inequities of society were perpetuated mainly via the structure of discourse, which occurred within and along all societal interactions. Bernstein's work with horizontal and vertical discourse helped to show how information was developed and knowledge was valued in schooling. Horizontal discourse was much like the everyday/spontaneous concepts, which Vygotsky (1997) wrote about. Horizontal discourse was, for Bernstein, mainly the discourse used outside of schooling and was used as the preferred means of meaning making within schooling for the lower socioeconomic segments of society. Vertical discourse was the discourse of schooling and was structured in a way where meaning was built upon previously understood scientific concepts and was a privileged way to make meaning for schooling and the more educated and wealthy members of a society.

Teachers mediate the vertical discourse of schooling. For the students in this study to develop a scientific concept of summary, they needed the discourse from the teacher to present the vertical discourse about which Bernstein wrote. Bourne (2003) exemplifies how bridging can aid students in their development of school-valued knowledge. The teacher in Bourne's article, like the teacher in this study, often stood in front of the classroom and led the class discussion. Unlike the teacher of this study though, the teacher in the article switched between everyday and school valued register choices, which helped to socialize the students into the discourse community. Switching between everyday and congruent language to technical and incongruent language was a way for the teacher to move between the discourses.

These changes allow times for exploration, for the introduction of horizontal discourses and more personally embedded meanings, building more *disembedded* concepts while still maintaining the necessarily

strongly framed teaching agenda of an examination-focused curriculum carrying the whole class through the agenda as a collectivity.

(my emphasis, p. 515-516)

Disembedded concepts are the scientific concepts of Vygotsky (1997). Vygotsky argued that scientific concepts were only developed in the act of schooling. The teacher in this study, however, used almost exclusively, everyday and congruent language to develop the scientific concept of summary. The teacher did not use the school-valued language in regards to the concept of summary. There was no way for the students to develop the vertical discourse valued in schooling and thus begin developing the scientific concept of summary.

One way students make a bridge to school valued language is transforming congruent and everyday language to incongruent and technical language (Christie, 2002b; Gibbons, 2003; Mohan & Beckett, 2003; Schleppegrell, 2004). The teacher and students in this study used interpersonal metaphors and valued school language (i.e. summary, book review, tone) in classroom and interview talk. There was evidence of school valued writing in the final summary task for Steve, which was lexically dense and had more technical words than Leslie's final summary task. The occurrence of these school valued features helps to highlight that it is not these single features (i.e. density or lexical items) but the configuration of language use that makes a student's writing more or less academic. It is maybe not be surprising that no evidence was found of movement from congruent to incongruent language because, as I have shown, the teaching provided no bridge from the everyday to the more technical academic language of schooling.

The students in this study could have benefited from a more explicit highlighting of the connections and relations that work together to form the concept of summary. The open-ended

nature of the teacher's definition of summary, (see Examples 3, 8, and 9) provided the students with a spontaneous concept, not a developing scientific concept. The teacher did not frame summary from her position of authority in the school, and thus participated perhaps completely unwillingly in the "hidden curriculum" (Christie, 1991).

The teacher used several interpersonal metaphors during the summary lesson perhaps because she self identified as a critical educator and embraced Friere's ideas about education openly to the class (See Appendix D.1). The following definition of the critical approach applies to the teacher's decisions in the classroom and the overall framing of her class.

In political terms, a critical approach to literacy adds up to a 'pedagogy of voice', a narrative for agency.... It is part of a moral and political project that links the production of meaning to the possibility for human agency, democratic community and transformative social action. (Cope & Kalantzis, 1993, p. 52)

The teacher wanted the students to participate in transformative social action as evidenced by her final project, which had as its main criteria a focus on community action. The teacher often used political examples, such as the animal liberationist Peter Singer or Jonathan Swift's *A Modest Proposal*, to highlight her ideas (see Appendix D.2). She wanted students to have a voice in their community and in their lives. The language examples (e.g., banging his wife, this dude committed murder) from the teacher were very much in line with this view of critical literacy. Her language served to break down the hierarchy of schooling and served to allow her to participate in teaching not "from the top down, but only from the inside out" (Friere, 2001, p.621). Her language use was meant to allow the students to enter into her world, a world where the students' voice had agency, which was not bound by school codes and decorum.

The teacher's everyday language allowed and reinforced that the concept of summary was accessible and demonstrable through this type of language use. But these everyday and congruent words left the students without a bridge to the school valued language they needed to develop the scientific concept of summary. Knowledge production, a creation of the teaching and learning relationship, needs a literacy, which "[prioritizes] reflection, enquiry and analysis" (Hasan, 1996, p. 408). *Reflection literacy*, as Hasan named it, necessitates that teachers "sensitise pupils to not simply the overall schematic structure of the text... [but] also be concerned to show what alternative ways there are of saying the 'same thing' (original emphasis, p. 411). Exploring alternative ways, while showing the structure and the function of a text (i.e. summary), allows the teaching and learning relationship to focus on how different language can affect meaning.

The focus on language allows words that create concepts to rise to a level of analysis while simultaneously allowing language to be the object of study. Examining different grammatical selections for saying the "same thing" allows for the study of the structure of the language and an examination of the form-meaning relationships. From here, the teaching and learning relationship can develop a dialogue on why certain structures or meaning making choices might be more or less appropriate for the given genre or context. The teacher's use of interpersonal metaphors, which created an undefined relationship between the components of the concept of summary, made it difficult for the students to prioritize the components and structure of summary. Being able to develop a dialogue between teacher and students that prioritizes and analyzes the components on the concepts is in effect the reflective part of reflection literacy. In this literacy approach, together student and teacher work to bring to light how different language use realizes different meanings. But the dialogue is developed, maintained and coaxed by the person charged with the authority to initiate the relationship: the teacher.

The teacher and students of this study seemed to create a harmonious relationship, as I saw no real evidence of discord. The students furthered their understanding of the concept of summary, as well. But the lack of explicit school-valued discursive mediation during instruction about the concept of summary may have impeded the students' development of the scientific concept, and, by extension, their ability to engage in reflective critical literacy practices.

#### **5.4 IMPLICATIONS FOR INSTRUCTION**

This study began with an examination of the Pennsylvania Standards for Secondary English Reading and Writing. It was noted then that the standards are conceptually very dense. This study has shown that the concept of summary, a common concept in ELA classes, is an involved and complex concept (see Figures 9, 10, & 11). That the concept of summary is quite complex leads me to suggest that the implications suggested here could apply to many of the concepts in the ELA curriculum.

First, teachers must be aware or conscious of how they talk about concepts in the classroom. In this study, the classroom talk from the teacher about the concept of summary was at times confusing. Confusion, which can be resolved as meaning is negotiated, is understandable given the considerable amount of conversation that teachers generate in any given class period about the multitude of topics that arise. But it would seem, given the variety of talk and topics that accompany any given lesson that teachers need to be aware of the language they are using to mediate the concepts under development and this awareness can be accomplished in a number of ways.

One way for teachers to be aware of the language they may need to use in a lesson would include having an outline or a lesson plan with key terms or concepts about the day's topic, so that the teacher has the language necessary to explain the concept at their disposal. This script does not mean the class is prescriptive in its delivery, indeed, the art of teaching is being able to make split second decisions about the students' needs *as they arise in classroom talk*. But having a plan predisposes you to being prepared for the direction the classroom talk can take you. The predisposition comes in the form of reflecting on what it is you want to occur during the lesson, and what that might mean for you in regards to concepts that may or may not have to be covered during the lesson. The multitude of concepts and the complexity of these concepts that one might encounter during a lesson need to have precise language to deliver and develop them. For example, teachers need to be clear about the process they use to identify or to give attributes to the concept being discussed. Indeed, because the concepts are so complex, we must be able to use classroom talk about the concepts in a way that is precise and understandable for the students.

Highlighting and being explicit about how the language is developing along the *mode continuum* (See chapter 2) could help the class develop a meta-awareness of the how language is used in the teaching and learning context. For example, in Example ten the teacher could draw attention to here *everyday* example by labeling it as such (i.e. banging his wife). This explicit marking of the role of language could then continue as the teacher explicitly the marks another way the same ideas can be expressed (i.e. events of his demise, shocking event that altered his life). Expressing the same idea using different grammatical choices, and then labeling it as a move towards academic language makes the familiar, unfamiliar and new again. You analyze the

familiar; thus, bringing the familiar into focus as an object of study to remind us of the complexity of the object.

Teachers also need to ensure the concepts students are developing are towards scientific concepts and one way to aid this development is by doing tasks to identify or check that the concept is in fact developing. Checking for the development of the concept of summary was conducted to a degree in this study's classroom. The teacher asked the students to do a "summary of a summary" as Steve called it (see Appendix D.9). This summary was to check how the concept was developing. But this singular act of checking alone may not be enough. One way to check how and whether a concept is developing is to have dynamic and on going assessment in place as a part of the classroom culture. Having dynamic assessment (Kozulin & Garb, 2004; Poehner & Lantolf, 2005) as a part of the classroom culture could allow the teacher to inculcate habits into the teaching and learning relationship that could provide for more opportunities for feedback and self-assessment. Some ways to develop a culture of dynamic and are to: (1) have more formal teacher assessment tasks (i.e. quick in-class written summaries); (2) have students do peer feedback (i.e. develop a class rubric for a concepts components and have peers check each others work); or (3) provide for more informal assessment through question and answer sessions during class, or informal written feedback sessions at the end of a class period.

Having students do quick writes, which could have them to define a concept, explain a concept or use a concept, would allow the teacher to have feedback on how the students understand the focus concept. If the concept were summary then having the students define or explain summary would give the teacher some material to examine overlaps, gaps or misunderstandings the students had regarding the concept of summary. These overlaps, gaps or

misunderstandings can be used to develop other lessons, which could explicate or highlight some of the gaps or misunderstandings.

Peer feedback would be another way to build in assessment into the classroom culture. For example, if the teacher had previously drawn out her concept of summary and posted it on the wall, the teacher could ask the students to explain summary in their own words. A peer then could read this explanation, and label the parts of summary the student had written with the components of summary the teacher had put up on the wall. Having peers work together in this fashion allows both students the opportunity for feedback on the concept in question.

Lastly, the teacher could make it a habit to ask students to explain in class what the students understand the teacher to have said. For example, if the teacher indicates written summary is the gist of a reading with a writer's position on what the story might mean then the teacher could ask a student to repeat back to her what she had just said. This technique allows for the teacher to hear what the students understood in their own words. It also gives the opportunity to the teacher to ask for clarification questions, such as, "what does gist mean?" This type of question and answer session could give the teacher feedback about the concept under discussion in a very quick and timely fashion.

The work within this study lends itself to the suggestion that putting the teacher's understanding of the scientific concept in plain sight could benefit the class. In other words, the teacher should make the concept's relations and components clear from the beginning. For example, if summary is the concept under development then have the teacher define summary by putting it in writing, and by putting it in a prominent place in the classroom, so that it may be referred to during class time. Explicitly defining and then displaying the concept would serve as a continual reminder of what is expected by the teacher; it would be overt and explicit, and it



would become a part of the class' expectations for their work. Putting the concept on a piece of whiteboard for example, (1) makes the teacher be clear about his own understanding of the concept; (2) allows the students a consistent reference point when the concept is a part of the discussion or is needed by either teacher or student during a task; (3) begins to develop a shared vocabulary in the teaching and learning relationship; (4) allows the web of relations and components to be known; and (5) allows other concepts to be added to it as it is subsumed or connected to other concepts. The above examples could unmask the scientific concept and have it be on display to the entire class. And while Vygotsky (1997) argued that defining the concept is not enough to develop the concept, I would argue that the act of defining the concept in schooling by explicitly marking the components, by making clear the interconceptual connections and relations, and by having a consistent indicator of the teacher's concepts for the students, is invaluable for teacher and students alike. The concept maps used in this study for data collection may be a good way to show the various components of a concept.

Explicit mapping of the concept as a stand-alone task is another possible pedagogical implication from this study. In this study, the teacher and students wrote out a concept map that delineated and visually marked the participants' understanding of the concept. This concept map could be a valuable tool in the classroom. It could serve to mark the initial developmental level of the concept for the students. It could also function as a recall tool in times of work for the students. They would have a physical representation of the concept, which could be augmented or challenged as the concept developed over the time of the unit.

Using the map to mark the initial developmental level of the concept is important from the standpoint of Vygotsky's work and from the work done in this study. When Vygotsky (1978) wrote about the ZPD, he was clear to point out that work within the ZPD could only occur if the

teacher knew the initial developmental level of the student's concept because the interaction with the teacher had to occur just beyond the developmental level the student held. Concept maps could mark a student's initial developmental level and be used together with the teacher's defining concept map to highlight the gaps between the student and teacher's concept. Focusing teaching on these gaps would help make the class time and experience more productive and focused on the specific development of the concept(s) at hand.

The pedagogical implications stated here are not meant to suggest the teacher in this study was not prepared or was not thinking about some of these points. The implications stated here are possible ways students and teachers can develop each other's conceptual understanding during the teaching and learning relationship.

## **5.5 THEORETICAL IMPLICATIONS**

One of the primary implications from this study is that concept development can be tracked through talk and can be mapped using graphic organizers. Using talk and material representations to map concepts has not been done to a great extent in ELA research, and having tools to allow the researcher to investigate how concepts are mediated in talk and through visuals can lead us to a better understanding of how concepts develop through time. Mapping could add a distinct element to studies on concept development. For example, Lee (2006) wrote how her work in Cultural Modeling (CM) set students up for success in the ELA classroom because CM worked to incorporate the students' spontaneous concepts into the teaching and learning relationship, so as to develop the school valued scientific concepts. In her article, the concept being worked on was *symbolism*. Lee wrote that the students held a spontaneous concept of

*symbolism* and she used the students' ability to understand the symbolism in a hip-hop song as evidence of a spontaneous concept. The song and its symbolism were, for Lee, the everyday and thus verification of her claim that the students had *symbolism* as a spontaneous concept. That the students understood the symbolism in a hip-hop song is not evidence of a spontaneous concept; it is evidence of a *developing* concept but whether it is spontaneous or scientific cannot necessarily be understood. For Lee's article, it is critical to know the initial developmental level of the concept of symbolism because she wrote that she was able to work with the students in their ZPD's and develop the scientific concept of summary. Tracking the concept of symbolism, by having the students do a concept map and through interview talk to try to ascertain their initial developmental level of the concept of symbolism would be a way to get a clearer understanding of their initial developmental level of the concept in question. The suggestions above are not meant to critique Lee's work, which is outstanding on a number of fronts. My suggestion is simply an example of how mapping a concept could be put to use in current work in the ELA field.

My study helps show that the *word*, which embodies the concept, is more than a simple lexical item. This study, with its tracing of a concept's development in talk and through material, illuminates the concept's complex web of relations that Vygotsky (1997) argued was fundamental to a concept's make up. The complex web of relations shown in this study emanate from the word and are revealed in talk and through its material representations, where all of the components of the concept are present simultaneously. But only by examining the different contextual landscapes where the concept is present (i.e. concept map, classroom or interview talk) over a period of time can we capture the complex relations that serve to create the concept, and that serve to aid or hinder its development.

This study used a novel approach in trying to understand the semiotically mediated nature of the concept through the use of the concept map. The concept map, used within a strictly Vygotskian study, was a novel tool to track and indicate the semiotic relationships that exist to create a concept. The map is visual in nature, and thus provides a unique account of the logical connections that help make up a concept's meaning. The semiotic tool, the concept map, provides the researcher with a unique opportunity to try to understand how the map represents the concept for the participant, potentially revealing relations that would be left hidden if one were to rely solely on talk.

## **5.6 FUTURE RESEARCH**

Tracking concept development through talk and concrete materials can be applied to work done on how concepts change over time, or how concepts are affected by certain tasks. In some senses, the stability of the word allows the researcher the unique opportunity to track the word over long stretches of time.

For example, teacher education programs make investments in time and energy in preparing preservice teachers for the rigors of teaching. Yet, when teachers leave the profession they tend to exit within their first five years of teaching. One application of the concept tracking researched in this study could be to track how important teaching concepts (e.g., inquiry learning, reflective practice) change from the time preservice teachers exit their programs over the first few years. The important teaching concepts could be concepts the teacher education program wants the exiting students to carry with them as they continue teaching. These concepts generally are ones that leaders in the field (e.g., professors of teacher education) understand to be

necessary to be successful and hopefully, happy in teaching. Tracking how these concepts change over time could help illuminate the pressures that exist to change the concepts we expect teachers to have or to perform as they exit teacher education programs.

Another area for exploration is the concept maps. The concept maps, as discussed above, are created without vocalizing the relationships between the nodes and the ideas expressed within the nodes. Looking at the grammar of the concept map could be an interesting exploration of other ways of looking at the maps as semiotic meaning making devices. Kress and van Leeuwen's (1996) *Reading images: The grammar of visual design* would be an excellent place to start an exploration of the concept maps presented in my study.

A final area for exploration could be a longitudinal tracking of a concept like summary across different classroom contexts over a longer period of time to investigate how the concept of summary in ELA might be different from how summary is used in history or biology. This type of longitudinal tracking and comparison could provide us with a unique insight into how different disciplines define and use similar concepts, and how these concepts carry from one context to another.

## **5.7 REFLECTIONS ON THE STUDY**

As a novice researcher, this study has presented me with a variety of experiences. Some of these experiences have been largely positive and some of them more challenging. One of the biggest challenges has been the describing of the teacher in this study. This teacher declined teaching the honors courses in her school as a reward because this population was not the one she wanted or thought needed excellent teaching. The reasons for her declining to teach the reward courses and

her desire to serve a specific population are positions I admire in her approach to teaching. She cares for these children as students and as people. Her community is small and she tends to know their life circumstances and uses this knowledge of their lives out of school to try to affect change in the students' lives. She buys them clothes if they need them. She designs classes that mandate they examine the community they live in, and then she tries to get the students to address some of the community's challenges.

In this study, her concept talk was shown to be confusing at times. At other times her talk, was an effect tool to bond her with her students, although it was certainly not school valued discourse. Her classroom talk, while possibly an asset in getting the students to trust her, was not a bridge to the scientific concepts and school valued language these academic students needed to succeed in classes outside her class. As was written, these were not the honors students, and as such were exactly the ones that needed to have the teacher to serve as a bridge to the valued schooling discourse that they, to date, have been only mildly successful. Knowing the teacher, valuing her as a person, and then having to question conscious or unconscious choices she made proved to be a difficult task for me to endure.

Existing as a researcher within the classroom culture was a great joy. I enjoyed hearing from and speaking with the students. I appreciated their acceptance of me into their classroom and culture. I enjoyed the work, the thinking, and conversations that occurred with those involved with this project and me. The voice of academic writing has proven to be an elusive voice for me and this struggle has been frustrating at times, but a frustration born out of wanting to do this dissertation well.

In the end, the concept of dissertation has grown for me in a way that makes the components and relations very complex. This complexity would be shown by each node having a

double tipped arrow to connect it with the other nodes. The page the concept would be drawn on would be large to accommodate new conceptual relations. The page would also be done in permanent marker, as this concept has now been finalized.

## APPENDIX A

### *Semi-structured Interviews*

Warm up questions.

How are things today?

How is class going?

Ok, now we are going to talk about the class itself.

What do you think were some of the main ideas or concepts that the teacher has been presenting today?

How would you describe summary?

Why do you think summary was important for you to know?

What are some components to summary?

What are some differences between summary and plot?

Why do you think these are differences?

The protocol to follow is for the third and final student interview.

The initial questions:

How are you today?



The lesson just completed was about summary. I am interested in knowing more about what you think a summary is at this point?

[Depending on answer, I can ask more or less instructive questions]

*If answer is very vague:*

What does *summary* mean for you?

How is it different do you think than an overview?

What are the features of a summary?

Does it have specific features?

What are some of these features?

Why are these features important to a summary?

*If an answer expands on what a summary is without more structured questioning then I will give assistance to the student as needed to probe the depth of understanding about the concept of summary.*

What aspects of summary do you think you can do or control?

What aspects of the summary do you think you cannot do or control?

What do you think knowing about summary could help you do in the future?

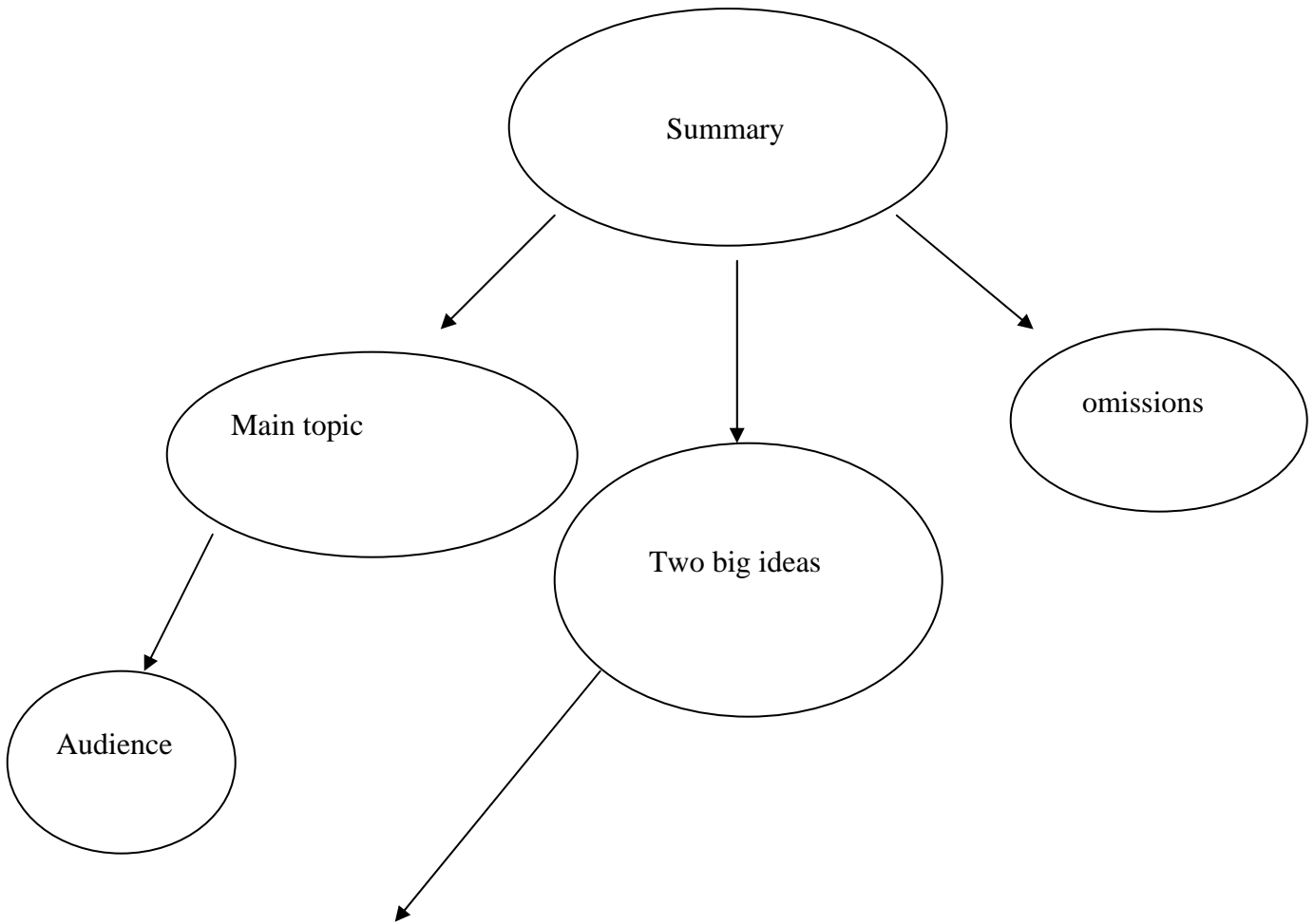
In what ways might knowing about summary be useful for you?

What specific components of summary do you think you could use in other situations?

After this unit, what do you think the teacher's goals were for you and summary?

**APPENDIX B**

**VISUAL REPRESENTATION**



**APPENDIX C**

**CLASSROOM OBSERVATION TEMPLATE**

Date \_\_\_\_\_ Time \_\_\_\_\_

Focal students present \_\_\_\_\_

Activity \_\_\_\_\_ Goals \_\_\_\_\_

Notes:

## APPENDIX D

### TRANSCRIPTS OF CLASSROOM AND INTERVIEW TALK

#### D.1 CLASSROOM TALK ONE

*T = teacher, S = Steve, L = Leslie, NF = non focal student, Q = question, R = researcher*

*Talk about the specific aspects to the review, and plagiarism*

L – Will you give us a paper of like, how, what you want

T – I did didn't I?

L- well, I mean like

T- do you have these Leslie?

L – yes, yeah, I mean something like

T- is it not clear to you is there something I can clarify

L – like uhm, I mean like put a quote up here and then you put like a little bit of the story here, you know what I mean

T – ya girllll, you put your quote on top,

S – aren't you asking like how to write it?

T – explain why you picked your quote including the author and title, give me the reason you picked the article, plus the plot without giving the story away

L – just a little bit [xxx]

T - yeah, right, the biggest problem, I find that my academic students have is trying to tell me the entire story, I'm not

NF – in a paragraph?

T- No, no, no, what my academic student do is change to 9 point, single space, no margins, don't do that to me, you're reviewing work, so your just giving me the highlights, and maybe not even in terms of specific plot but you may want to say, intrigue occurs when the protagonist experiences a bizarre effect that changes his life right? And you can have told me about the plot without saying that Joe encountered his ex-wife and whatever you,, you what I mean, so you are not giving away the story line, like a movie review, read some book reviews in the newspaper online read how they are written so you can see how they sound, if you tell me the whole thing, I don't want to read that book are you done? Yeah, you have told me you have done it all, and then Leslie the important thing here is the sociohistoric context, what work is the work doing? When was it written and how did it impact society or how did society impact the book and that is the big big deal of this, because that is your final exam for the second half of the class, the British lit part of the course that is your lit final we are going f *talk about books genres timeline for class Final exam questions*

T - but that is the idea *back to talk about the review* how did society progress? You know, yes sir

NF Q

T - well thanks for asking, *spells esoteric on the BB* esoteric is like intangible

NF Q

T – tangible like concrete this table is tangible, *knocks table* like but fear or love or maybe they are kinda like abstract nouns, but good is an esoteric concepts like you spend your

life to come to know something that is esoteric I know what a desk is unless we talk about the essence of desk Plato talks about deskness ... Intangible is, let me, first do tangible, would be what ?

NF talk

T - that is an interesting idea Jordan, Jordan says tangible is something you can destroy but can you destroy courage or could you destroy god?

NF talk 29:05, in a way but like you can't take away someone's beliefs

T - I don't know

NF Q

T- well tangible is something you can perceive with your senses right? So intangible is something beyond our perception, tangible, you can touch it, you can sense it, use your senses, you can touch it, a desk is tangible, an intangible is God, I can't know for certain

S- not able to grasp?

T - yes, *laughs* or difficult to grasp yeah I think it's considered esoteric like if you spend your life trying to understand, like I don't hafta come to understand a desk, *laughs* a desk is a desk, it's tangible I don't have to, you have to come to understand courage, god or things like that, so it's sort of an esoteric question like, who are we? You know that's a lot different than desk

*Book review dates etc., talk about the course's requirements and lunch money*

*The semester project is contextualized as something that needs to be relevant to their lives. She does this very consistently. She wants the work they are doing to matter to them. To be of their lives. Her examples bare this out. Friere reference*

*T contextualizes the persuasive essay, Columbine reference and Marilyn Manson's music as a possible influence in the killings, is an example she gave*

T -It needs to be something you can stand dealing with until mid-January

T – to do something real with it, if you want the A, if you don't want then A then you can blow off the do something real with it

T – if you are going to do one on herpes, then I want you to go to your health class and present it, and say “did you know that one in five adults has herpes?”

## **D.2 CLASSROOM TALK TWO**

*Talk about people in class and town*

*Bell 1:10 of tape seating chart talk*

T - please get out your table of contents

*Talk about the novels they are reading, talk about A clockwork orange task and target talk*

T – did we talk about the sociohistoric context? Of the novels of the book reviews? Ok, can we talk about this and get this out of the way. Let's talk about literary analysis ... FYI for your book reviews, and did I talk to you about the political implications of the literature you are going to read?

S – yeah and how it shapes the culture

T – yeah good, and how it shapes the culture, how it reflects the culture, you have to contextualize your works, pardon me XXX

T – I mean, you do give a summary of it but we have to talk about that too, because I don't want, in a book review, I don't want too explicit a summary because you are trying to intrigue your reader, we are going to start with some news articles, now I want you to summarize those and they will probably be more explicit than your book summaries, for a book review you want to give us enough information to make us want to read the book, but not so much as to ruin the story for us, instead of saying for example, in fact maybe what we should do today is go to the lab and pick out a book review and start to analyze some of that, to give you a model of what to look for when you're writing your book review but instead of saying something like, Uhm John came home and was shocked to find his wife banging his best friend, you might want to say, uhm, John came home to shocking surprise that would change his life dramatically or lead to events of his demise, uhm you don't want to say his best friend was banging his wife because we want to say, ohh, what was that shocking event that altered his life? Ya know, so a book review is going to be a different kind of summary and if you're talking about a news article and this dude committed murder he's pleading temporary insanity because his best friend was sleeping his wife, you're gonna wanna tell us his best friend was sleeping with his wife, so that is a good question XX so the kind of summary you are going to do is based on the kind of work you hope your writing does, that's an interesting question, so

S – so we are not actually revealing

T – no in the book review you are actually not revealing, I mean it would not hurt to say, these are the main characters and introduce to the characters, I want to know about that guy or I want to know about that woman, that woman is the a high school dropout and struggling with issues of this n that and the other thing, you know, so yeah I want to know who your characters are, I do want to know where it takes place



S – How many pages do we need

T – it cannot be more than a page

S – okay

T – and my academic students, no offence talk too much, do not make it single space, 9 pt font there is an art no a science, to be concise, if you're going over a page you are giving me far too many details, and really your sociohistoric context is going to be *pause* a paragraph, that's arbitrary, and you're thinking now you're looking, do you have a quote on top, you're explaining why you chose the quote, and a paragraph of sociohistoric context and now you have less than a page, you can make it single space, but don't make it smaller than 12 point I have 42 year old eyes ... so I want you to go to the lab today and find a review, it could be a book review, a movie review, it can be a video game review, I want you to find some sort of review and print it out and I want you to analyze it. Write this down please, on your sample review page. It's a 40 point assignment *grade talk until 14:21* this is arbitrary, or not arbitrary, but rather we devised this list together the class and I so if you think that I'm omitting important information, you should talk about it and include it, I want to know what type of material the reviewer includes, what's included in the review, what type of information? That's 10 points that's substantive, I want to know what it is the review finds it necessary to put in his or her book review, what type of information, I want you to try to name the tone, naming it not try and discuss it, naming it is a point, the tone is sarcastic, the tone is fiery, the tone is, what is the tone of the review *sometimes written work is referred to with spoken types of concepts. "tone" "you should say" etc.* that's a point, but ten points for discussing the way the author establishes tone. How does the author establish tone? How does the author establish tone? I want you to tell me, how can an author establish tone? What do I mean by tone? What is tone?

S – like an emotion?

T – yeah, emitting to emit emotion, what is the feel of the piece? Yeah that's nice. How would one establish tone in his or her writing?

S – diction?

T – good diction like what? These things, have I talked about the project yet? Because I'm gonna want you to take a position, to convince us, and tone is something I want you to consider when you are reading and writing because you are going to establish tone in your piece and certainly in your presentation which you are going to give to us. You're gonna want to create a feeling in us and your gonna want to use some sort of tone to do that, so *welfare mother talk* and the example of Swift's *A modest proposal*. There is a tone in that piece, he wasn't being literal, he was being sarcastic ... there is nothing modest about eating children but he was being ironic, he was using irony, and irony is a way to establish tone, if you want to show us how absurd it is for the Irish to keep reproducing when they are this poor and how absurd it is for the England to exploit Ireland, you might use irony that might be your tone, that might be your technique when you are writing a research paper you might want to use you may not want to use a straight up, "abortion is wrong and it is murder and it is" you might want to use "imagine the world full of" I don't know I can't think of it off the top of my head, you might want to be ironic, you are going to use a tone to persuade us that you are right, when I see the starving Ethiopian child with flies on its eyes and the distended stomach, I want to send my money. There's a tone in that, so how does the author establish tone? Diction, word choice *pointing at the BB* establishes tone literary figures, you might choose to use irony, how else might you use figurative language to establish tone? What do I mean by figurative language? What do I mean if

I am talking about being literal? What is literal? Let's get some words on the vocab list. What is literal?

NF Q

T – I am not sure I understand what you mean. If I say, I didn't mean that literally, what am I saying?

L – you're not being serious

T – I don't mean, literal means exactly what you mean, say exactly what you mean *verbal processes* if I say to you, hit the road, am I gonna go outside and *slap, slap on desk* hit it literally, if I say, hit the road I'm using figurative language and I sort of like using language in a more creative way to make a point, right, when I say hit the road, I do not mean that literally, I won't go outside and slap the road, what do I mean, I mean go away, go somewhere else, so how might a person use figurative language to establish tone?

S – through humor

T- excellent, through humor, go on put down humor, and what's funny?

S – what's funny?

T – yeah what is humorous? What if I think the school is funny? How am I going to convey that? what makes the school funny?

S – they're blunt, they can say exactly what comes into their head

T – okay there is definitely a humor in that, being direct, being blunt, that's a tone, there is tone in that, a person who is forthright, bam there it is I'm just gonna lay it on the line, that's tone by being blunt, it's the approach they take to convey meaning, it's the approach they take to convey meaning that establishes tone, am I gonna be slow to get to the point, am I gonna make want this information as I'm reading this, am I longing for more or am I gonna make my point

right away? There's tone in that, we're gonna read this article by John Leo, Peter Singer is this animal rights activist and he works at Princeton, I think and I really like his philosophy, but I love this review of his work written by John Leo and John Leo opens this piece with, "Peter Singer is as subtle as a tank rolling over a wheelchair." That nasty ole Peter Singer, he *slaps table* likes to run over handicapped people, like right from the very first sentence, he's like, he's establishing a tone, I hate Peter Singer, and he's a tank and he runs over handicapped people, What's Leo using? He's a tank, Peter Singer's a tank?

NF

T – figurative language, he is, yes

NF

T -it's a metaphor, sure, through metaphor, umm *announcement interruption*, Okay, so how does the author establish tone? What do we have so far? I'm too messy to read it, how does the author establish tone?

NF

T – and we'll see, as we go through the articles we'll see there are other ways in which the author establishes tone, now this thing her *points to bb* I want you to know-evaluate, I want to know how the writer, how the reviewer evaluates the movie, and I'm sure that's connected to tone. I mean if he or she is the whole way through going, "the most boring movie I've ever seen" or the converse "movie of the century", there's that too, hyperbole, overstatement is also a literary figure. Movie of the century you cannot survive another day without seeing this movie, overstatement

L – what is that h-y-perbo

T - hyperbole *spells it out pronounces it* so I want to know for 5 points how the reviewer evaluates what's being reviewed, you might have four stars it might be connected to tone, there might be a subtle evaluation, or a direct four stars, three stars. How is it evaluated? And then lastly, I want to know how you, how you feel about the review for 5 points, how effective was this review, how effective was the review How effective? *Pause 2 secs* How effective was the review? And that should push it up to 40, does it? *Talk about the points break down, and citing the source of the review* and consider how that might affect the tone, how that might affect the tone ***They move to the computer lab.***

### **D.3 CLASSROOM TALK THREE**

6:00 *still talking about PSSA's*

*talk about Bourdieu and cultural capital minute 10*

*Standardized exam talk 12:15 – 22:30*

T – tomorrow we have these articles due, and yesterday we did one in class, and you are getting it, just, do you have questions on this?

NF

T – yesterday what we did, I want you to, we went through this article and we underlined, I just tried to model the way I work through an article, so I underline things that I thought should be included. We read the paragraphs and when we went through the paragraphs and we came to

something important we underlined it. If you read the article there were some phrases, you know you have to use quotes at least once. Phrases that are like powerful I think, when they call the New Orleans school system beleaguered (emphasis) that's a word with a lot of description

NF Q

T – I means, uh beaten down, you know, like tired, do you know I don't even know. When it says the superintendent she resigned and after resigning she found it a relief, I thought it would be important to quote relief. Why do I think that? *4 second pause* what I was trying to do yesterday to show you how I think, as a woman who has more education than you have, I was just trying to show you how I think through something to model it for you, right? But I can't even name the reason I am making that choice, I think you should take that quote "she found the resignation to be a relief" because it really speaks to how she was feeling. It lets you reader know her feelings. Like Steve you gave us a lot of help yesterday on writing this summary. How was it that you decided upon the information that should be chosen?

S – well uh I like to talk, so talking through it usually helps me, talking through my head helps me put it into words the whole thing.

T – When you were reading it were you talking?

S – Uh huh

T – And what kind of things were you saying?

S – Well lots of crazy stuff that didn't need to be in there, but at least find thoughts on the main points of the paragraph or the sentence.

T – okay so picking out the main points first, what's the article about? Lets not lose track of the fact that it is about the head of New Orleans school steps down. That's the focus of this article, at least as reported by the title. So we are going to use things in this article like, Like

what is the author claiming is the main point. We are gonna try to stay focused with that. So you started us off Steve with NF somebody, superintendent of New Orleans blah, blah, blah You started us off with the main point, right? And then picking the main points throughout the paragraph right? That's what we did. We made a sample bib, we read through this, we talked it out, we underlined the important things and from there we tried to devise a summary of what should be included.

NF Q

T – Well, yes, today we, I wanted to talk about tone

NF Q

T – Yeah, no, I don't want to make this out to be a more complicated assignment. I want it to be a bibliography on top, and you summarize the article, include one quote, and write your opinion. That's what I want. Right and I wanted to show you something today. *Points talk, talk about the historical situating of Class ends with her handing out the Peter Singer article.*

#### **D.4 INTERVIEW ONE WITH TEACHER**

B- Thank you for this time, some of the questions I have first are, uh, when you say book review what are your expectations of the students?

T – Well, I want them to be a reviewer. So I want them to establish tone, that is something that we'll get into, I want to know whether they like it, I want them to recommend it or not uhm, I want them to understand the major *ideas* (emphasis)I mean like the first part is an opening quote and then explaining why you picked the quote or how it is reflective of the

author's style or indicative of the author's style so, so I am trying to see, a lot of them like get to the crux of the issue and they pick the quote that is most meaningful, and these are some things I can talk to them about why they have chosen that (1:50)

R – Ummm

T - Ummm

R - Can I ask, when you said tone, what do you mean by tone?

T –I want them to like work on what it is, what kind of message they are trying to convey

R – the piece itself or them as writers?

T – Them as writers

R – Okay, okay, how do you see trying to help them or assist them in understanding a major quote or a major tone, I mean you and I are as who we are educated, blah, blah, blah, might be able to get to that fairly quick just by virtue of our life experience with text, how are they going to be able to pick out the major quote, the important thing?

T – Well, they won't necessarily

R – (laughs)

T – But when I ask them about why they chose what they've chosen through dialogue hopefully we can come to a uh, well sometimes it is like well that was just the first page, or that was just what I came across, through dialogue and when I am discussing what the novel's about or what work they think the author is trying to do then I can try to help them at least narrow a section of the novel or whatever that they want to pick something from

R -So will you know all the novels that they have probably chosen?

T - I do because I have been doing this so long that even if they have chosen something I haven't read I have read so many reviews



R - right

T - and I'm forced to go do research on them to make sure that they're doing the work

R – the uh and Uhm you said also something about dialogue and negotiation so do you feel that that's a concept, the book review, that is always in flux for you or do you have an ideal in your head?

T – I give them a really rigid step-by-step procedure but I do that for the uh, the reluctant writer, you know someone who wants to get the [xxx] students end up writing really fabulous pieces and I don't want that “oh well your not following the guidelines” I really do want them to take liberties with it and to read some reviews to see how reviewers sound and so forth

R – oh okay, so they do look at examples of the genre, are they examples of because that is interesting because I was thinking as you talked about the internet and stuff like that I mean things that you can find on the internet right kinda lack that generic control right? Because for example Yahoo movie reviews, like you or I could submit a review so, it's that genre has kinda morphed, it's no longer just a New York Times piece, or the LA Times or the Brownsville Times or whatever, Do you think about any kind of, do you qualify the genres? Like if you got one from the Atlantic Monthly it might be better that uh

T – I might do that now

R - (laughs)

T - But I also probably have to accept the fact that the genre is changing. I have a kid who wants to do a review of a video game so that is something new from a student

R – Do you feel comfortable with that?

T – yeah that is what he wants to bring in as his example to look at how it's written

R – oh an example of a review of a video game

T -yeah

R - oh I see he is not going to review a video game, oh that's interesting, I wonder if it is a published gaming piece or from the internet

T – now I am going to ask that (5:23)you know ask where they got that and I will go find a few to look at too and see how they differ

R – Oh yeah I would think, that is interesting because we were thinking of going to the movies recently and I read some on Yahoo, and they were all over the place, and yeah that is interesting to because the whole idea of what a review is changes quite drastically uhm, so uh, what role do you think summary plays if any in the book review?

T – um, I think, it plays a great role, I think summary is important in almost everything we are doing because they have to even if they are doing, just responding to what a peer says they have to reiterate their notion they have to understand their peer's idea and usually restating it in terms of refuting it or responding to it is a part of that right? So like even as soon as, like I'm doing my lit review, so that is like summary is what we do from the beginning of school and it reflects our understanding of a concept so it's

R - So do you expect as participants in the classroom to recast what their peers have said? And then address it? Or is it just, implicit in their

T - Sometimes, but if it just seems off the wall then I have to ask them or another peer might have to ask them, well what exactly are you responding to that Maggie said and see if they get what Maggie was saying

R – Okay so being explicit about the reflection is a part of it as well, So I guess that is a question, will you be explicit about what you just said?

(pause)

R – Do you understand my question?

T – Yeah, sometimes I think like if everyone is getting it right?

R – So how do you know they are getting it right?

T – I mean like are they getting it, right?

R – So how do you know if they are getting it?

T – I think if we, we know they're getting it if we are all following it then it means they are getting it, now they may be getting it in a bigger way than we are getting it so they may have a meta-awareness that we're not getting but still I ask them to summarize to help me to understand their level of comprehension or ...

R – This is, do you, since you brought is up, esoteric (used in that day's class) can students have the meta-awareness without having the language to represent the awareness?

T – yeah but once you have that awareness it can bring you to a whole new level and you know you are able to apply it to other things like you can have an epiphany right?

R – right

T - but when you start to look at your own life critically which language allows you to do and I guess I don't know if it's language, but I guess you have to the language before you have the ideas, It's almost like *As I lay dying* was I talking about that? In the class you were in?

R – Faulkner? Today, no not today.

T – Cuz he has the character speaking colloquially and seemingly in simple ideas and so forth and then he has that italicized or parenthetical information where we come to understand that they are much deeper individuals so I don't know, but I certainly think that giving them the language gives them the ideas

R – So I mean how much do you think these students are bringing with them from prior courses that will aid them in what you're doing? Do you have a sense of this? Are they coming with some understanding, is this new understanding?

T - are we talking summary?

R – summary and book review, excuse me yes.

T – I uhm find it difficult to review, as I am doing this review I find it difficult to summarize even though I have a ton of experience writing so sure they're coming with a lot of experience I imagine, but I don't know how much I mean if you look at some of the questions some of the other teachers ask them I mean they're not asking them to be they are just asking them to give back a sentence, so I don't know how much experience they are coming to class with.

R – because there is a difference between parroting and summarizing.

T – Right and I think they are just used to giving back what was said to them

R I can give you back what they said but do I understand what they said, I need to recontextualize it

T – and I think they are used to giving back directly what was said

R – And these are seniors

R – there were 18 kids today, and fourteen of them were girls

## **D.5 STEVE INTERVIEW ONE**

R – thanks for agreeing to do this

S -no problem

R – how is the class going?

S – good I love her.

*Small talk about his schooling in Brownsville*

R –can you tell me what you think a book review entails?

S – reading the book, comprehending the details and write down in your own words what the book was saying

R – she has mentioned, analyze, you guys are practicing analyzing short newspaper articles, so when she says, “analyze it” what do you understand analyze to mean?

S – analyze it, break it down, whether it is an article or a newspaper or whatever it is, breaking it down into smaller subjects

R -within the, that are part of the article?

S – uhhuh,

R - so some of those subjects might be then?

S –for example, if the article is about high school theatre it could be broken down or analyzed into certain categories like, uhm, the types of theatre the schools are doing or stuff like that or pros and cons

R – so do you take that to be part of the socio-historic context as well, or is the socio historic context something a little bit different?

S – it’s a little bit different. you mean when you analyze it?

R – well, how are different or related, within this book review and all this work you are doing?

S – It's a little bit different. when you analyze it you don't have to go in as much detail as the socio stuff. It could be brief, when you're just simply analyzing something

R – what is the socio stuff you think?

S – when you are going through something, well The teacher said, *pause* she said something that stuck with me, she said, I wrote it down, can I look at what I wrote?

R – feel free, sure

S - *30 second pause* I can't find it.

R – that's okay, summary will come up, so tell me a little bit about what you think summary is?

S – an overall grasp of a reading, any reading

R - do all parts of the article need to be included in the summary?

S – no just the main parts, or the main part

R - do you think you find those main points in a certain place, or with certain words the author uses to highlight ideas?

S – it could be, or it could be one line that is for the person reading the summary or even a word if it has that much of an impact. But usually a line or a few sentences that give it a nice overview of what the article is all about

R – do you think it is the responsibility of the reader, I mean so what I hear you saying is a word might me differently than it might impact you

S- it's the person's responsibility who is writing the summary, and to give a good foundation for the summary so it reaches everyone the same way

R – oh okay, the last question I wanted to ask you is about, I wanted to ask you what you felt the word tone meant.

S – the tone of the story I feel is the way that it has impacted the writer of the story, the way he is hearing the story, the way he or she is hearing the story, whether she is happy or sad or whatever it is, the tone of whatever it is that they are trying to get you to understand.

R – is tone conveyed by words, or together with sentences?

S – I would say that it is tied together with words and the characters and everything like that,

R - *pause*, okay, is that it,

S – yeah,

R – okay thanks very much

## **D.6 LESLIE INTERVIEW ONE**

R – thank you, I appreciate it. So you have your book reviews?

L - What? Oh wait, my bad, yeah.

R - so are you enjoying the class?

L – It’s not bad. Kinda confusing though.

R -What’s confusing for you?

L – I don’t know. A lot of things like she’s talking about, I look to other people and ask, “What’s she talking about?”

R -Yeah, it can be a lot of information. Have you had her before?

L - Nah ah *NO*.

R - There can be a lot of information. She once spoke about writing a book review that was effective. For example. What do you think she means by effective?

L - It's like how it affects you. Like if the thing didn't mean anything to you, it would be pointless to do. But like if you did a story like that you were interested in or that affected you and you could make it more interesting if you told someone else.

R - Effective in that it affects other people

L - or you.

R - yeah. She said she wants you to do an analysis of an article for example. When she says the word analysis, what do you understand that to mean?

L - Like, whadda you think about it, about the article or whatever you had. And like if you had to talk to someone else you could tell them what you thought when you read it or whatever, or anything like that.

R - okay. Do you think this ever has to do with the argument the person is making, like, whether it is an effective argument or an ineffective argument, or is more about how it affects you?

L - it could be how it affects you or it could be like how it affects someone else, or it could not give you enough information and you don't know whether you like this or you don't.

R - she has also talked about the need to summarize the piece. So what do you think goes into a summary? What are the important parts for you?

L - Uhm, you don't put like all the information. Like if it was a love story like you Romeo and Juliet two young adults that came from different backgrounds and they feel in love, *this previous part is told in a slower deeper voice than she normally speaks with. She changed it to be the "summary voice".* and can't be like she's from here and there and like, you can't tell



the whole story, you know what I mean. You give a kind of brief you know what it's about. They were from two different places and they fell in love, and they ended up, well not together but, they tried, you know what I mean? That's the worst story to put it to.

R -no I understand I think you're talking about the high points or the

L - yeah, you can't be like well one day she went out and picked flowers and *blah, blah, blah* you can't be like that.

R – things that might seem inconsequential

L -you need the climax of the story

R – the resulting thing, the big

L -yeah, they went through many difficult things to get together but in the end ... or something like that

R – do those important points come in a, I guess my question is, how do you know what's important? Because there's lots of information.

L – How do you, uhm, *pause* there's lots of important information in the story *pause* the main point of the story. What the writer wants you to find out. Like, if they got together, or if it is just a story about a girl that did like nothing with her life. Well the climax of that story could be that she found something she liked, and she did it all the time or something like that. You got to find, the end of the story. The resolution.

R – okay, so this girl leads a boring life

L -yeah and she likes baseball, she like to play baseball

R -and she becomes very passionate about it, so it can be a change

L -yeah and the summary can be, *change in voice* a girl that had a boring life or whatever ended up finding something she's really passionate about. But tell, don't spurt out everything. You can't be, she went to a game on February 7<sup>th</sup>.

R - Which leads me to one of my last questions is about the sociohistoric context of things. What does that mean for you?

L -*pause* I couldn't tell you, If you paid me.

R -the other word she has used to describe what you working on is, tone.

L -tone.

R -yeah, what's tone?

L - tone is like emotional, like how people when they write it. Like how they put their words. Like, she went to the store yesterday, you have to put it like, emotions into your words, like different words,

R – if we said she went to the store, hurriedly, or angrily

L – yeah words like that with emotion

R -my last question is what role to you think summary is going to play for your book review?

L -probably just like, background information. Like you don't want to give all the information away because they would be like, well I already know what happens so now I don't need to read the book. You kinda want to give a little hint but not give the whole thing away.

R - the major plot points. So, you have to summarize enough

L - to make them want to read it.

*Doing first concept map, R has to write it out for her because here right hand is in a cast*

R - I'll put summary in the middle, but what would you put off of summary?

L – facts

R – I will let you hook them up any way you want to

L – climax *pause* resolution *pause, teeth sucking* I guess this is probably it. Is this for my book report?

R -Well, summary in general.

L -Well kinda give an introduction. I guess that is basically it.

R – Thanks very much.

L - you're welcome.

## **D.7 STEVE INTERVIEW TWO**

R – how did the presentation go, good?

S - yeah that was fun

R – what were some of the good parts about it?

S – well I like to write, and that was fun

R – you asked a question and I am curious about this, that there is a difference between reading versus speaking, do you think there would be difference between if it were read versus spoken?

S – well I didn't know if she wanted me to read it, or say what I took away from it tell what the article was about and then tell what I took away from it just without the paper

R – so from your article from the National Geographic how did you choose what was important to relate or summarize?

S – I read it at least two or three times. It wasn't that big it was like, it was like a half a page and I picked out the stuff that stood out to me as something maybe that you would see in a newspaper, like on the front of the newspaper

R – so let me ask you about that what stood out to you, were they words, were they phrases, were they

S - things in quotations

R – oh okay

S - I only used one quote in my take on the article. I one only used one quote cuz I think if you use so many quotes it takes away from the basis of the information. But if you use one it will show there is a foundation for what you are saying and that what you are saying is true. But if you leave out all that and leave it as the basis of information of what the people were saying, and there were a ton of quotes, and what the interviewer is saying to the interviewee then I think it gives more impact. And it makes the reader kinda see what the other person is saying.

R – so, you the reader in this case? Or the listeners of the presentation?

S – me the reader, writing what the writer said.

R – so to get the genre straight, the article was an interview with this guy from Cal Tech?

S – yeah he was writing with, he was being interviewed by the Washington Post and they put it in the national geographic. And they gave a lot of quotes and that's why I stayed away from the quotes, but put one or two in there, I don't remember how many I had. I'm pretty sure it was just one.

R – were there other, and this seemed to be what T asked you, was this difference between planet and planetoid central to the article?

S - that wasn't said in the article. That was something I knew from science class, that wasn't even a part of the article

R – oh well in a way that confirms her question about what you are learning in science class.

S - I'm not taking science now, it was something I learned in maybe, 7<sup>th</sup> grade, and I saw the word planetoid and I knew the difference.

R – what do you think, I will get a copy of your work and the article, but what do you think is the most important aspect of this article?

S - that there is a whole new meaning to science in that area, because we used to just look at the main planets and there so much more out there that we can within those, maybe not as planets but as smaller life forms of planets, but uhm, I think the main point of the interview was his take on what he saw and what he thinks will be happening in the future and what he thinks should be coming up in maybe science topics or

R – maybe the future direction of people looking at planets.

S – uhuh,

*Talk about planetoids*

R – well, uh, here is your mind bubble, and so I want to ask you would you now change anything, add anything, subtract anything,

S – uhm, I did this really fast

R - for me there is not really a right or a wrong, so...

S - so I put another oval under .. and your personal take, and that would be uhm, imagining, I said imagining because when I was reading I imagined myself in the interview with him, hearing what he is saying, so that always makes me connected with the reading

R - so you would put yourself in the place of the interviewee?

S - yeah so, like I'm being interviewed, like what I would answer differently or how I would answer the same

R – oh that gives you an interesting perspective, one quick question for clarification, you have put “run through” off quick description, what is a run through?

S -oh that is my theatre mind, uhm, it's a description, it's a quick overview of what is happening, when you read a script it is a quick run through the scene or the song ... no costumes, the big picture of things, at the act level, usually.

R - oh, okay, thank you so much

## **D.8 LESLIE INTERVIEW TWO**

*Talk about her hurt wrist*

*R offers food, Leslie accepts*

R – Let's talk about your presentation. It was a day ago, how do you think that went?

L -it was okay I guess.

R - What do you think was good about it?

L - Uhm, I don't know. It was good I guess.

R -yeah, I liked it. Well let me ask you, you chose the Galapagos Islands, and that's not XX, and it's not Pennsylvania, so how did you choose that place?

L - I was just reading the paper and everything and just found it interesting, and even though it is not that far, but places can be like so different and like you don't realize it because

you're in a place like the United States where everything is so free like you can do what ever you want, say what ever you want and like when you read about other countries and like they are so different but they are not that far away. Like South America I mean it's America but it's south.

R – Yeah, I mean Ecuador is the more northern part of Latin America and it is not really that far at all.

L – No, and it is so different and I feel bad because I want them to live like we do.

R - yeah, do you feel free to do what you want and say what you want here?

L -uhhuh

R - so the connection was, and let me paraphrase and you tell me if I'm correct, it was in contrast to what you experience has been here in the United States

L - uhhuh

R – they were censoring speech, or censoring the ability to go places, right? Basically, he came in, and they told him to leave right?

L - yeah, he was walking around on the street and the police came up to him and told him to leave

R – you seem to be summarizing what was occurring and the contrast between the things seem to be of a personal nature, and then you brought up your brother I believe in the Air Force?

L – yeah he's in there

R - yeah, how did you make that connection because we have Ecuador and the Galapagos Islands, and we have brother in the Air Force, which is highly personal, how do those things

L - uhm, because he is going to be travel a lot, and he is going to be going to some of these places and anything is possible, you know, and normally you know they let him out of the base, I mean they have to

R - right

L - you just can't coop him up like they could be out and see something, like they have to wear their uniforms, like they could do anything, like they could kill him, they could rob him, anything, and if they are walking by themselves, and I mean you could be the biggest guy

R - right

L - but it could be like one guy against 20 and it doesn't matter how big you are

R - right it's not going to matter

R - So when you thought about what you had to summarize for this piece, can you tell me about some of the things you thought were important or you thought you needed to make it interesting or relevant or for the points

L - for my presentation?

R- yeah

L - Well like here if there's things going on that are not really supposed to the president makes laws that says you can't do that, well, but in Ecuador and all that the president is like in on all this, so I don't even know how to put all this, like the whole country is in on doing all this bad stuff and no one can like if someone was in front of you house dealing drugs and stuff, you can't say anything about it because the president is in on that too, you know what I mean?

R - uhhuh

L - so it's like they walked scared I guess

R - so if we look at you concept map and you had, climax, facts, introduction would, you or how would you make changes to this concept? You can't write, so I will write for you.

L - I don't know you have like facts are basically everything, uhm, I guess you could be like personal details



R - where would you put the details?

L - off facts

R - so the personal details about the facts?

L - yeah

R – so in your thing about the Galapagos islands can you give me an example of the details that you thought were important about the facts?

L - the facts like the president and everything that was involved, like there was a lot of drug activity and communism and everything like that like being in more detail, like they couldn't do anything about it because the government was involved

R - so you felt detail was relevant to bring up to the students because it was something we could directly contrast to the United States or ... because it was part of our experience?

L – yeah, I guess

R - okay, I'm just curious. Communism as a political institution has been kinda considered “defeated” by whatever, so why did you think communism was an important detail to include in the summary you were doing?

L – I don't know. It said it in the article. It said it was there, and that's not how it is here, and like, I don't know.

R – it was a contrast to the way it is here, a democracy or whatever you would like to call it, it is not the way we perceive ourselves to be

L - uhuh

R - I want to ask you one last question, Emily started her presentation with a quote, and I'm wondering if you would consider using a quote, or if you thought it was effective to include that in a summary, and if so why, and if not, why not?

L - I don't even know what she said, I couldn't even understand her. I don't know. I don't really know what you're asking.

R - okay, Emily chose a quote for her paper, my question is why might someone do that?

L - to get your attention.

R - to get your attention, that's effective?

L - yeah, it means something to you and you want to like, if there's something you want to get through to your audience, you can be like, Well, blah, blah, blah, and be then something like

R - so you have to, so I'm going to try to understand this, the quote would have to mean something to you in relationship to what you were trying to say

L - yeah like if you were trying to say something about books, or reading, so you would put something about good books right in the beginning so people were like, ahhhh, okay, you know?

R - yeah, right great thanks for everything.

## **D.9 STEVE INTERVIEW THREE**

R - so what did you think was important in *Angels on a Pin*?

S - uhm, well what was important was the student's different view on how the teacher should be teaching maybe *pause* on not just focusing on scientific method, but just basic theory

R - what's the scientific method do you think?

S – well there’s scientific method to everything, but he was talking about physics and scientific method, but instead he just used every day logic to answer the question so,

R – so how did you respond “to the extent”, did you agree with his point of view, or

S - I agree, it’s always easier just to explain, that go through what science is trying to explain. It’s important to know the scientific part of it

R – when you were thinking about of the question that says “summarize” did you have in your mind, gosh I need to include this or I should put in a quote, or was there anything that kinda came to you that [the teacher] has been talking about that you knew you needed to include?

S - well one of the things [the teacher] made us do was the summary of summary, and that’s what that is. I didn’t use any quotes or anything. The basic summary of a summary, so ..

R - did you think quotes were unimportant?

S – not in this, quotes are important for proving what you think, but they were not important in this case in saying whether you agree or disagree.

R – okay is it because your personal opinion and not

S - uhhuh, you’re not trying to persuade anyone

R - oh okay, something [the teacher] has talked a lot about is plot, is there a difference between plot and summary?

S - uhhuh, a summary is just an overview of the whole story and the plot is where the story takes place, who the characters are, it may not tell you the troubles the character’s have or where the characters have lived

R - which could be important in a summary?

S - yeah and the summary it could go through that, where the characters live, what time period it is but the plot just tells you what the time period is

R - do you think the plot is important to incorporate into a summary?

S – oh yes, you should incorporate the plot into the summary, but maybe not a whole summary into the plot

R – okay so they are not interchangeable?

S – no

R - this is your concept map, is there anything you would change or add to, or take away?

S - *20 second pause* I would say, *pause* light plotting, I know that is not a word

R - it is now

S – but that’s basically what a summary is, you’re just going through light plot of what the characters are, of the time setting. Like if you did a summary of the *Wizard of Oz*, you would say “a young girl named Dorothy goes through a ..., but in a plot you would say, “Dorothy lives in Kansas, in a small house in Kansas with her aunt and uncle, where in a summary you might not mention that she lives in kansas or you might not mention she lives in a small house

R - why not?

S – cuz in a summary I think it is important to just sum it all up and not give away too much, where the plot would give away everything

R - okay, well my last question to you is, [the teacher] has talked about it a lot, and you guys have talked about it a lot, how do you weigh what is important?

S – read it yourself and see if you would like to read it yourself after you read it

R - okay so read it and decide, in the *Wizard of Oz* in your example, why might you not mention that she is on a farm in Kansas?

S - everyone reads about living on a farm, being on a farm, maybe you want to say, “an imaginative girl takes an adventure on into a whole new plane, instead of saying a little girl gets

knocked out by a window pane and goes into an adventure 5:45 but uhm, that would probably be about the plot

R – so you choose things that may or may not be important?

S – you choose things that are in everyone’s interest especially in a persuasive summary

R – so it has to have relevance for all

S - yeah

#### **D.10 LESLIE INTERVIEW THREE**

R – *talk about her hurt hand* how did you decide what was important in this reading?

L - oh, what do you define as important?

R – that is what I’m asking you actually

L - oh, uhm I don’t know, like to show that there can be other answers besides scientific notions and everything like that it doesn’t have to be wholly this method, it can be other stuff

R - did you agree with the student’s point of view?

L - yeah, cuz we don’t use half the stuff we learn, like I don’t remember the stuff the next day

R - well one of the things [the teacher] has been saying to you guys as I listen to the tapes, is that you have to pick out the important information, like when you are doing your summaries, so that is my question to you, how do you know what is important? Really, you made a decision here, how did you make that decision?

L – well uhm, something like that catches your eye or sparks your attention

R – okay something that grabs your attention, because it's fantastic or because it's repetitive or

L - it can be anything, it can be something like, oh my god, or it can be something like [xx]

R - so it could be one little point just mentioned once and that could be important?

L - yeah

R - what are the differences do you think between plot and summary, because [the teacher] uses that word a lot plot when you are doing your summaries

L - the plot is like the main point of the story, like why the person wrote the story, and summary is like everything the story is basically about, you know what I mean? I don't know how to explain it. Summary doesn't have to include the climax but it doesn't have to be specific plot in the story, it's like your telling little details not like you would with the plot

R - okay which has much more detail

L - yeah like why, what happened, blah, blah, blah the summary is just a little bit of the plot but not all the details

R – did you include a personal response in your book review or did you stay away from that?

L - I said I didn't like it, I don't know, I don't know

R - that's okay, this is our last time with the map, is there anything you would like to change or add or subtract

L – probably put more detail in the resolution, summary, no uhm, *reading her work* I don't know

R – okay how about, what do you mean by details?

L - like resolution, they want maybe more details, like what happened, where did they go,  
what did they do, not just they lived happily ever after

R – okay so more specifics

L - yeah

R - would you do anything else

L - I don't know, I don't know

R - that's okay, do you think you are finished?

L - yes

R - okay, great thanks.

## APPENDIX E

Angels on a Pin

A Modern Parable

by Alexander Callandra

Saturday Review, Dec 21, 1968.

Some time ago I received a call from a colleague who asked if I would be the referee on the grading of an examination question. He was about to give a student a zero for his answer to a physics question, while the student claimed he should receive a perfect score and would if the system were not set up against the student: The instructor and the student agreed to submit this to an impartial arbiter, and I was selected.

I went to my colleague's office and read the examination question: "Show how it is possible to determine the height of a tall building with the aid of a barometer."

The student had answered: "Take a barometer to the top of the building, attach a long rope to it, lower the barometer to the street and then bring it up, measuring the length of the rope. The length of the rope is the height of the building."

I pointed out that the student really had a strong case for full credit since he had answered the question completely and correctly. On the other hand, if full credit was given, it could well contribute to a high grade for the student in his physics course. A high grade is supposed to



certify competence in physics, but the answer did not confirm this. I suggested that the student have another try at answering the question I was not surprised that my colleague agreed, but I was surprised that the student did.

I gave the student six minutes to answer the question with the warning that the answer should show some knowledge of physics. At the end of five minutes, he had not written anything. I asked if he wished to give up, but he said no. He had many answers to this problem; he was just thinking of the best one. I excused myself for interrupting him and asked him to please go on. In the next minute he dashed off his answer which read:

"Take the barometer to the top of the building and lean over the edge of the roof. Drop that barometer, timing its fall with a stopwatch. Then using the formula  $S = 1/2at$ , calculate the height of the building.

At this point I asked my colleague if he would give up. He conceded, and I gave the student almost full credit.

In leaving my colleague's office, I recalled that the student had said he had many other answers to the problem, so I asked him what they were. "Oh yes," said the student. "There are a great many ways of getting the height of a tall building with a barometer. For example, you could take the barometer out on a sunny day and measure the height of the barometer and the length of its shadow, and the length of the shadow of the building and by the use of a simple proportion, determine the height of the building."

"Fine," I asked. "And the others?"

"Yes," said the student. "There is a very basic measurement method that you will like. In this method you take the barometer and begin to walk up the stairs. As you climb the stairs, you

mark off the length of the barometer along the wall. You then count the number of marks, and this will give you the height of the building in barometer units. A very direct method."

"Of course, if you want a more sophisticated method, you can tie the barometer to the end of a string, swing it as a pendulum, and determine the value of 'g' at the street level and at the top of the building. From the difference of the two values of 'g' the height of the building can be calculated."

Finally, he concluded, there are many other ways of solving the problem. "Probably the best," he said, "is to take the barometer to the basement and knock on the superintendent's door. When the superintendent answers, you speak to him as follows: "Mr. Superintendent, here I have a fine barometer. If you tell me the height of this building, I will give you this barometer."

At this point I asked the student if he really did know the conventional answer to this question. He admitted that he did, said that he was fed up with high school and college instructors trying to teach him how to think, using the "scientific method," and to explore the deep inner logic of the subject in a pedantic way, as is often done in the new mathematics, rather than teaching him the structure of the subject. With this in mind, he decided to revive scholasticism as an academic lark to challenge the Sputnik-panicked classrooms of America.

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<sup>i</sup> Notable exceptions include: (Lee, 2000, 2006) & (Lee & Smagorinsky, 2000)

<sup>ii</sup> The translation used for this study is the 1987 Minnick translation of *Thinking and Speech* which a number of scholars (Daniels, 2001; Gillen, 2000; Wertsch, 1985) have argued is a truer translation of Vygotsky's writing than the often cited 1986 *Thought and Language* version. Though one author (Karpov, 2003) found it useful to go between both translations depending on the point he was trying to make.

<sup>iii</sup> <http://en.wikipedia.org/wiki/Adolescence>

<sup>iv</sup> An Education subject search in the University catalog under the keywords "Vygotsky" and "education" yielded over 6,500 references.

<sup>v</sup> Eggins, 1994, p. 113

<sup>vi</sup> It should be noted here that the book reviews from the students and their drafts were to be a part of this analysis, but it was discovered after all the data was collected that the students I focus on in this study had in fact, *not* read the books they claimed to have read for the review assignment. After hearing of this information, I felt it was necessary to

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omit these drafts and reviews from the analysis, as I could not safely write about what the students did for summary, if in fact they had not done the assignment the summary was to be based in.

<sup>vii</sup> The teacher's second and third interviews are not analyzed because the research questions explicitly ask about the students' development of the concept of summary as it develops through their talk, and through the assistance of teacher classroom talk.

<sup>viii</sup> Neither student could provide for me their practice summaries, which had some teacher feedback on it. I repeatedly asked for these papers, but was unable to acquire them.

<sup>ix</sup> I limit the map to interview talk because there was little to no classroom talk that involved the students.

<sup>x</sup> The teacher only added one node to her concept and that was "plot," which was added after the second interview.