Sentence Combining and Thinking : A Study of Adult ESL Learners

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Abstract

This paper begins by outlining the development of the thesis question from the classroom concerns of a teacher and the broad theoretical questions of a graduate student to the preliminary selection of method. Sentence combining is chosen to represent the writing process in a form suitable for introspective study through think-aloud activities. Literature review chapters address the theory and practice of sentence combining and thinking-aloud, arguing that such a study might be most effectively interpreted through a qualitative lens. Five participants, all adult students at a community college, who represent a range of backgrounds and first languages, volunteered to be interviewed and to think-aloud while solving several sentence combining problems. These sessions have been summarized in detail and interpreted in the light of a number of theoretical and practical concerns. The results confirm that sentence combining allows students to model most facets of the writing process and requires them to employ higher level thinking in a constructivist learning situation. They also suggest that the breakdown of ideas into "kernel" sentences may offer special benefits to second language learners. Individual differences among the participants are explored from 4 different points of view: syntactic and lexical skills, learning style, personal aesthetic values and communicative priorities, and age of language acquisition. There are a number of suggestions for further research, both in questioning the Critical Period Hypothesis as it applies to the full spectrum of adult language development and in better understanding the nonverbal aspects of thought. Implications for language teaching include the use of sentence combining to promote thinking in a second language and the effectiveness of sentence combining in helping students to grasp complexities of form while developing their own personal voices as part of a whole language writing program.

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CHAPTER ONE: INTRODUCTION

Development of a Thesis Question

Moving from a broad theoretical question to a research design narrow and basic enough to be completed by one Masters level student is a difficult and prolonged procedure. No researcher can create a comprehensive design for inquiry instantaneously, but a qualitative researcher in particular wants to take advantage of the greater flexibility and naturalism she can achieve by allowing her design to emerge throughout the course of her study[1]. Creswell (1998) stated that "a researcher begins a qualitative study with general questions and refines them as the study proceeds" (p. 78), while Merriam (1988) pointed out that the qualitative researchers' own interests and knowledge play a central role in both the design and outcome of the research. Both these important factors in the shape of an inquiry should be openly discussed throughout a study. In my case, my original area of interest was large enough to be intimidating, and my concluding design was completed in the midst of the research. It may be helpful for those hoping to understand my goals and the interests and understandings I bring to my interpretation to record the background to and emergence of my research design from my teaching concerns and initial broad questions to a proposed topic and method.

Teaching Background

Since I am a teacher, the origins of my research interests spring from my teaching experience. For much of the past 12 years I have taught practical English skills such as reading comprehension and essay writing to developmental and first year students in community colleges. Although none of these courses has been officially designated English as a second language (ESL), due to the demographic make-up of Toronto area colleges, and

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[1] Throughout this paper, nonspecific singular pronouns will alternate feminine and masculine, by paragraph.

particularly of those who find themselves in remedial English classes, a majority of my students have been adult second-language learners. I have enjoyed working with these immigrant students, as well as with those who are native speakers, and believe that exploring ways to help them achieve competence or even fluency in English is a worthwhile challenge.

I am not sure the community college administrations share this goal, since they have several times cut back the range of programs and hours of instruction provided for the teaching of English. The courses I teach at present, Developmental English and College English at Seneca College, allow respectively 52 and 39 hours per term, besides the exam, to bring students with weak vocabularies and poor understanding of sentence structure to a "postsecondary" level in writing. Perhaps because this task is so daunting, some of my colleagues seem more frustrated than inspired by the challenges of teaching writing to students who may never fully master their second language. In reaction to their negative remarks, perhaps, I have become a partisan, concerned to make sure that the curriculum I teach, within its time limits, has the maximum potential not only to help ESL students to write better, but also to help them to "think" at higher levels, as North American college students are expected to, and to feel more comfortable with English-Canadian culture in general.

The "thinking" part of the English curriculum is as important as the language, because, like other college teachers and planners, I believe that college level students should be able to think analytically about what they read and discuss in class. Unfortunately, second language students, even those with postgraduate degrees, are not always successful in demonstrating higher level thinking, for a variety of reasons. The easy explanation is that other countries' education systems are flawed; they may put too much emphasis on rote learning, demanding that students accept everything they read uncritically. But I have noticed that student ability in

solving higher level thinking tasks varies, and not necessarily by nationality. Perhaps the "foreign schools" explanation reveals more about our cultural prejudices than it does about what is really going on in our students' minds. A more comprehensive explanation may help teachers like me to promote more higher level thinking among all students, ESL and native speaking.

On the Relationship of Writing and Thinking

> The operation of thinking is the practice of articulating ideas until they are in the right words. (Frye, 2001, p. 268)
>
> No writer ever stands in full possession of an idea without having enough words to express it. (Gregory & Booth, 2001, p. 286)

These quotations from two essays on thought and writing, which appear in textbooks for introductory College English, have also prompted my professional concern, raising a number of questions. Must ideas be articulated in words before they are of value? Are students with weak vocabularies and immature understanding of sentence structure at a disadvantage when asked to comprehend or express complex ideas? What does Frye's thesis mean for students who are visual or kinesthetic learners? How far can oral discussion promote depth of thought when writing "is more deliberate than speaking?" (Gregory & Booth, 2001, p. 285).

I have long found that writing helps me to clarify my thinking and that my most profound learning experiences at university came from writing essays. This is why I enjoy teaching a course like EAC 150 that is centred on essay writing. I accept that writing essays is an excellent way to develop the sophistication of our thinking. However, I know that the word "essay" has very negative connotations for many of my students, particularly those who claim

to prefer "hands-on" learning. Class activities that explore learning styles or personality types (such as True Colours™) have highlighted the differences in the way people learn. My reading of Howard Gardner's (1993) *Frames of Mind* has added to my curiosity about the variation in student strengths and thinking strategies. Does essay writing benefit all students, or does our emphasis on reading and writing skills reflect an institutional bias towards linguistic intelligences above all others? And given that many students will need language skills in the workplace as well as in school, how can I make the connection between thinking and writing more cogent to students who are not naturally gifted in language?

Research on Adult Language Learning

I have come across another possible explanation for the problems some ESL students experience when asked to think analytically. I was researching a paper for a course in Adult Teaching and Learning for the M.Ed. program of Brock University and reading about the Critical Period Hypothesis, an explanation for the fact that adults learn language less easily than do children. Here is the relevant passage from that paper:

> There is an underlying assumption that ESL students, whatever their age and background, are incapable of higher level thinking skills that makes me uncomfortable. Rance-Roney (1995) feels that "conceptual development exercises need to be part of the curriculum at every level, and some academic skills can be part of all adult language learning" (p. 3). This is certainly what I try to do in EAC 149 [Developmental English], with mixed success. Perhaps part of the problem can be traced from what Elissa Newport (1994) describes as the "less is more" theory of language acquisition. Newport and her colleagues were exploring the paradox that although adults do better than

> children at most cognitive tasks, children are significantly more successful than adults at learning language, whether first or second language.... Newport hypothesized that "the more limited abilities of children may provide an advantage for tasks (like language learning) which involve componential analysis...[because] children perceive and store only component parts" (p. 554). Another related theory by Rosansky (1975) proposes that "adults are worse at language learning because the emergence of formal operational abilities interferes with implicit learning strategies more suitable for language acquisition" (Newport, p. 557). Both theories suggest a conflict between the cognitive processes needed for learning language and those needed for higher level thinking skills, like conscious analysis and synthesis. As far as I can tell, nobody has explored these theories to determine whether learning outcomes that demand higher level thinking are incompatible with second language development, but it would be an interesting topic for research.

This possible conflict worried me because it suggested that we might, indeed, have unfair expectations of our ESL students when we expect them to analyze passages as well as translate them. Since that time, I have focused my research, wherever possible, on this problematic relationship between language acquisition and higher level thinking.

An Introduction to Language and Information Processing Theories

In the Brock University course on Language Development, I became aware that there are a number of competing theories trying to explain the language acquisition process in both first language and second language learners. Throughout this course, I speculated on the relationship between language learning and higher level thinking and found that it was, at the

least, complex and unpredictable, so that many questions have no satisfactory answers. In my notes from the course, I jotted down a number of specific questions related to this issue. For example, is brain lateralization a factor, in the sense that people capable of very high-level thinking in the visual/spatial areas might seem to be weak thinkers when they have to explain their thoughts verbally? (Notes, Sept. 17, 2001). How do the "rhetorical patterns" of languages affect thinking in people of different cultures?

In the end, I felt that the most comprehensive explanation for the difficulties ESL students had handling higher level thinking tasks came from the theory of information processing. This theory is centred on the concept of short-term memory (STM), which has a limited capacity. When an individual is learning a new language, that capacity is taken up with the tasks of decoding (relating the word he had heard or read to a personally constructed meaning, or *schema*) and encoding (producing an intelligible word to express his own meaning). The fundamental problem for ESL students in postsecondary courses is this: It is difficult for someone to have enough space in STM to allow higher level thinking when he has to pay conscious attention to decoding and encoding. Such higher level thinking skills as finding main ideas or making inferences demand significant amounts of STM space; writing itself is a complex task which is STM intensive. The only way to solve this problem is to give the learner a chance to *automatize* the lower level (knowledge and comprehension) thinking so that it does not require much "space" in STM. Unfortunately, studies have suggested that it takes many repetitions of an encoding or decoding task (250 to 1,000 practice trials) to ensure automaticity (Wagner, 2001). Worried about this, I made my first formulation of a possible thesis question:

> If ESL students are at a disadvantage facing higher level thinking skills because of capacity used in decoding and encoding–how can we help them succeed? (Notes, Sept. 24, 2001).

Some Experiences with Sentence Combining Exercises

When trying to read and/or write English, ESL students face challenges on three levels: (a) they read slowly because of the difficulty in decoding; (b) they have limited vocabularies, and (c) they have difficulty processing complex sentence structures because their own language may have different ways of structuring meaning (Notes, Nov. 12, 2001). The ideal way to solve all these problems and help them to read (and write) more fluently is to enable the students to read widely and steadily in English. Unfortunately, when it comes to the benefits of reading, as Christensen (1967) put it: "What may be true over a lifetime is not true of the fifteen weeks of a semester" (p. xiv). Teachers with limited class time and overworked students have to find short cuts. Sentence combining has long been one of mine.

I first encountered sentence combining techniques as part of a more traditional grammar teaching curriculum presented to students at Sheridan College's Academic Upgrading program, where I taught between 1989 and 1995. After students had completed several dull exercises that required them to underline subjects and verbs, correct run-on sentences, and complete sentence fragments, an activity that merely invited them to join groups of two to five "kernel" sentences into longer, single sentences was refreshing. The beginner-level sentence-combining exercises were straightforward, but some of the more advanced tasks were challenging even to me.

Sentence combining may have appealed to me because I enjoy word puzzles, but I believe it also appealed to the students. When they worked on these exercises, they often

seemed more cheerful and relaxed than they did working on traditional grammar or composition assignments. I can't pretend that most of them finished the activity sheet as noticeably better writers, but one incident showed me the technique had greater potential. A well-educated Iranian woman student, who was feeling growing frustration as her awkward English syntax kept her marks in the C range, appealed to one of my colleagues for help. That colleague suggested an intensive program of sentence combining, and the student, who was attending classes for 5 hours a day, 4 and a half days a week, did nothing in class but sentence combining for the next 3 weeks. At the end of that time, her syntax was dramatically improved and continued to remain fluent for the rest of the program.

I was impressed enough to choose sentence combining as the topic of a research paper I wrote a few years later for my preservice teaching degree. This gave me an introduction to the intriguingly controversial theory behind it, which is outlined in the next chapter. More recently, as I have experimented with and modified my curriculum for the time-limited Developmental and College English courses I now teach for Seneca College, I have progressively reduced the number of standard theory and drill based grammar lessons I include and added a little more sentence combining. I have done this for several reasons. First of all, the students find the grammar theory dull and either know it already (if they are ESL) or seem incapable of understanding it (if they are native speakers). At the same time, most of them find the actual grammar exercises too easy. High marks in grammar exercises bear little relation to ability in paragraph and essay writing. Success in sentence combining seems to be a better predictor of other strengths. This may be because most students show signs of really thinking about their answers as they solve sentence combining problems. Furthermore, the problems "work" for a wider range of students; both those who understand grammar and

those who write "by ear" can benefit from them. Not least, many students have told me that they enjoy sentence combining more than traditional grammar exercises.

Still, I am surrounded by colleagues who earnestly and conscientiously lecture on the rules for the use of conjunctions and the ways to avoid errors in pronoun agreement, and I am afraid to give traditional grammar up entirely. The question that I continue to ask myself as a teacher is this: Am I harming my students by rejecting traditional grammar and substituting sentence combining? This is the pragmatic question which drives my study, and one reason why, when I was searching for a focused activity through which I could inquire about the relationship of language learning and thinking, sentence combining seemed to be ideal.

An Introduction to Think-Aloud as a Research Method

Any teacher who has to read the sometimes garbled prose people write asks himself, "What were they thinking when they wrote this?" At other times, we are intrigued when normally struggling students produce unexpectedly strong writing. Why, for example, can many ESL students produce more complex yet idiomatic sentences when sentence combining than they can when writing on their own? Because of my desire to understand what is going on in my students' minds, I was attracted by a research method I encountered while writing a research review for my Language Development course. The article I reviewed was Marjorie Bingham Wesche and T. Sima Paribakht's (2000) "Reading-based exercises in second language vocabulary learning: An introspective study," and I summarized their method as follows:

> The current study [is] a *Reading Plus* introspective study.... In it a group of students read the same passage and completed the same eight vocabulary-focused activities, at the same time reflecting on what they are doing to an

> observing researcher with a tape recorder. This "introspective reflection" method is designed to go beyond exterior behavioural observations and attempt to understand learners' thought processes and emotions as they learn. One of its techniques is a "concurrent think-aloud" method; learners talk about what they are doing as they do it. This is followed by "immediate retrospection" at the end of each task, and later "delayed retrospection" at the end of the whole research session. In these latter sessions, learners were interviewed and prompted by questions to analyze their mental state during the task.

I cannot remember the moment when sentence combining and think-aloud joined together in my mind, but I know that I never considered one without the other. Sentence combining requires possibly more complex thinking than Wesche and Paribakht's (2000) vocabulary exercises, but it was equally manageable from the point of view of time and focus as a subject for introspective study. With the general topic of the relationship between thinking and language and two key aspects of the specific method in mind, sentence combining and think-aloud, I sent this preliminary articulation of my thesis ideas to my supervisor:

> Purpose:
>
> To explore the relationship between second language acquisition and higher level thinking (according to some definition!).
>
> Background Issues to Research:
>
> Language acquisition theory, especially for adult ESL.
>
> Definitions of higher level thinking/problem solving. Cognitive processes involved.

Brain lateralization issues. How the left brain demands of syntax, semantics affect the processes involved in the pragmatics.

Sentence combining (or other activity if chosen). How do students approach this sort of exercise? What strategies can they/should they employ? Do students of different learning styles use different approaches?

Decoding issues: How much does difficulty decoding vocabulary, unfamiliar syntactic forms inhibit creation of new sentence forms?

Methodology:

I would choose a classroom activity which involves higher level thinking as well as fairly advanced English syntax and vocabulary. Sentence combining could be a possibility because it involves problem solving and in fact is a miniature version of the writing process with all its steps. However, I could consider other activities.

I am considering a relatively qualitative approach to the question. I would select a number of students (possibly 6) from a variety of backgrounds, both ESL and native speaking (volunteers of course) and meet with each individually. I think the best way to handle this would be to do an "introspective study"–a sort of think-aloud questioning technique as developed by M. Wesche and T. Paribakht of the University of Ottawa in their series of studies on vocabulary acquisition strategies (1993, 1996, 2000, etc.). For this, the student works at the exercise while the researcher records his/her oral comments on what he/she is thinking. This process could produce a number of sources of data: the students' success in the key activity, the students'

introspective comments, the students' success in subsequent assignments (possibly), the students' overall opinions about learning English or writing English learned through interview or other writing assignments.

Knowing this was a fairly ambitious plan, I started to research the literature and fine tune my research method/methodology. The following chapters, dealing with sentence combining theory, think-aloud methods, and aspects of qualitative data collecting methods, outline what I learned from my readings of the existing literature, and suggest ways I might incorporate those findings in my research design.

CHAPTER TWO: LITERATURE REVIEW I

Introduction to Sentence Combining

1. Sentence combining is a teaching strategy.
2. The teaching strategy has been widely studied. (Gebhardt, 1985, p. 206)

Amongst the many types of exercises that writing teachers use to help their students read and write better, few have been researched as enthusiastically and debated as hotly as sentence combining (SC): "the process of joining two or more short, simple sentences to make one longer sentence, using embedding, deletion, subordination and coordination" (Connors, 2000, p. 103). It is a practice that is currently out of fashion with educational theorists, but I have found that it is still popular with students, and sometimes remarkably effective. When it was at the height of its influence, in the 1970s and early '80s, whole conferences were held to share its benefits; at these, numerous contributors suggested theories of how or why sentence combining works, but none ever achieved consensus. Yet study after study, first with native speakers and later with second language learners, has indicated that sentence combining not only helps students become more sophisticated writers, but also better readers and thinkers as well. Therefore, there is still much scope for inquiry about this deceptively simple activity.

During my review of the copious literature on sentence combining, from its beginning in the "sentence rhetorics" which sprang up in response to psycholinguistic theories to its more recent secondment in support of the writing process, I was especially interested in the cognitive implications of the activities. A number of these aspects of SC have been much researched and debated, but never resolved. These inspired a few questions I have explored further, both through secondary research of the literature and primary research of my research participants and their experiences.

1. How effectively does SC work with our natural language learning abilities?
2. How suitable is SC as a strategy for adult students learning a second language?
3. How much do we need a vocabulary of metalinguistic terms to understand SC?
4. How does SC fit into the writing process of composing, transcribing, and revising?
5. How well does the problem/puzzle aspect of SC encourage higher level thinking?

A History of Sentence Combining Theory

Although students have been given exercises imitating and manipulating model sentences since the days of Cicero, modern sentence combining was inspired by Noam Chomsky's (1957) theories of a transformational "grammar" that described the "deep structure" of all English sentences. This structure was said to be one that all native speakers understand intuitively, and that allows us to build more and more complex "surface structures" of embedded meaning onto our sentences, through modifiers of many types. Chomsky's theory of Universal Grammar (1975) had maintained that language capacity is a biological constant in all normal people, but educators are aware that not all speakers of a language reach its highest communicative potential. Factors such as natural ability, home environment, and education do separate average from high achievers, particularly in the areas of reading and writing. In 1965, Kellogg Hunt, in the spirit of Piaget, charted the stages of our normal syntactic development from one-word utterances to longer, more complex sentence (see K.W. Hunt, 1985). The pedagogy of sentence rhetorics developed by Francis Christensen (1967) and others aimed to supplement this natural development and promote "syntactic maturity" in students who might otherwise settle at lower levels of competence, writing in simple or "choppy" sentences.

In the 1960s, a series of quantitative "scientific" studies established that imitation of model sentences, expansion of kernel sentences through adding of modifiers, and, above all, combining of kernel sentences to create complex constructions all led to discernible improvement in student composition writing (Connors, 2000; Phillips, 1996). Some of the most impressive results came from John Mellon's (1969) efforts to promote fluency by teaching seventh-graders basic concepts of transformational grammar and then reinforcing the theory through exercises that required them to join sentences using a specified "transformation." Mellon felt that his exercises would stimulate his students to move beyond K.W. Hunt's (1985) stages of "normal growth" to reach "optimal growth"; also students whose development lagged because of weak home environments might be helped to catch up (Mellon, 1969, p. 16). Here is a sample of one of his sentence-combining "problems":

A grammar should establish principles.
The principles apply to all languages.
The principles reflect the basic properties of the human mind.
(and)
The principles would explain SOMETHING and SOMETHING.
Language is used somehow. (T:wh)
Language has those unique properties for-some-reason. (T:wh)
People usually restrict their attention to properties.
People are concerned with language differences.

A: A grammar should establish principles which apply to all languages, which reflect the basic properties of the human mind, and which would explain how language is used and why language has those unique properties to which people concerned with language differences usually restrict their attention.

(Mellon, 1969, p. 97)

In spite of their empirical "success," Mellon's rather rigid exercises, accompanied by ponderous theory, might never have been adopted so widely if Frank O'Hare (1971) had not

hypothesized that many of his students were ignoring the theory (surely well beyond the understanding of a typical 12-year-old) and working out the sentence structures intuitively through the exercises. O'Hare's study was built on the hypothesis that "sentence-combining practice need in no way be dependent on formal knowledge of a grammar, traditional or transformational" (p. 2). O'Hare's problems had one correct solution, like Mellon's, but he taught no theory at all and the clues were far less technical, as shown in this example of one of O'Hare's "simplified" sentence combining problems, also aimed at intermediate level students:

> The children clearly must have wondered SOMETHING.
> The bombings had orphaned the children. (WHOM)
> SOMETHING was humanly possible somehow. (WHY)
> Their conquerors pretended SOMETHING> (IT-FOR-TO)
> Chewing gum and smiles might compensate for the losses. (THAT)
> The losses were heartbreaking.
> They had so recently sustained the losses. (WHICH)
>
> A: The children whom the bombing had orphaned clearly must have wondered how it was humanly possible for their conquerors to pretend that chewing gum and smiles might compensate for the heartbreaking losses which they had so recently sustained. (O'Hare, 1971, p. 28)

O'Hare (1975) emphasized the importance not only of combining material to make more complex sentences, but also of deleting superfluous and repetitive words to communicate more with greater economy. He believed that his students would find his exercises challenging and that the satisfaction of seeing the sentences "click together" would help to motivate them, and he appeared to be right since O'Hare's students were even more successful in subsequent composition tests. Moreover, his grammar-free lessons appealed to a generation of teachers frustrated by the very limited benefits of teaching traditional grammar

(see Hartwell, 1985). By the mid-1970s, sentence combining had become a widely popular practice, especially in the U.S.A., as its implementation went through many further modifications.

Planning a curriculum for college freshmen, William Strong (1986) developed "open" sentence combining exercises, ones with no one correct answer, allowing students to solve the "problems" more creatively. Instead of building isolated sentences, groups of kernel sentences could be connected into whole paragraphs. This method was known as "whole discourse" and is the one I use in class and have chosen to use in this study (See Appendix A). These exercises not only helped students with sentence syntax, but also modeled rhetorical structures for different types of paragraphs with the aim of encouraging students to "improve writing both within and between sentences" (Phillips, 1996, p. 7). Strong (1986, 1990) also proposed exercises which were closely modeled on "literary" sentences from novelists such as Hemingway and even from poetry, as well as others which allowed students to add their own details in response to questions, and still others which became thesis statements for longer writing assignments. Following these improvements, a series of promising studies of sentence combining for first year college students led some advocates to recommend that the entire first semester college composition program be devoted to SC (Connors, 2000), although most teachers incorporated it into a more traditional composition writing program.

This was the usage recommended for Ontario schools in Fitton and McBeath's (1987) text, part of Ontario's Circular 14 listing. By this time, SC had come a long way from Mellon's (1969) pedantic puzzles. The Ontario text recommended oral experimenting and sharing of sentence combinations "since the flow of a sentence becomes evident when the sentence is heard" (p. 5). Its sentences were "open" and its pages free of grammatical theory.

Fitton and McBeath argued that students combining their sentences follow a miniature version of the writing process, involving the five steps of oral combining, search for possible combinations, choice, writing, and oral sharing (p. 8). Thus they relied on a student's innate, conversational knowledge of language, reinforced by peer feedback at the oral sharing stage. Although this book was creative and up to date, when I encountered it in 1993, it had been relegated to the Special Education classroom. In fact, SC was never as widely adopted in Canada as it was in the U.S.A. (Coman, 1995), and by the late 1980s the same pattern was taking place in the U.S.A. as well.

It was probably inevitable that so much "hype" about SC would lead to disappointment and backlash, as no one teaching strategy can hope to solve all the problems associated with such a complex task as writing. At the same time as SC lost its lustre, the "whole-language" movement began to dominate the teaching field, and SC, with its artificiality and "a-rhetorical" nature, became more and more rejected. Opponents of SC felt that, because SC exercises aimed to build syntactic skills to the point of automaticity, they were demeaning to students' freedom of self-expression and tainted by behaviourism (Connors, 2000). The new ideal was for a writing program that was wholly based on "authentic" communications in the students' personal voices. Related to this ideological attack was a critique of the many studies "proving" that SC led to "better" student writing. Those who favoured the new paradigm for language-based research rejected the "empiricism" of those quantitative studies but did not propose qualitative research as a countertest.

The sentence combining movement held its last major conference in 1983, and the resulting book, *Sentence combining: A rhetorical perspective* (Ed. Daiker, Kerek & Morenberg, 1985) contained a number of persuasive responses to the whole language critics.

In it, Richard Gebhardt (1985) argued that even though "the writing process should be the center of the composition curriculum" (p. 202), the traditional description of that process as "generating, drafting and revising" is overly simplified; the "complex and interacting operations of the hands, brain and eyes of a human writer" (p. 206) can be modeled through SC activities in several ways. For example, joining kernel ideas into longer sentences prepared students for expanding brainstorming ideas into continuous prose. Jeffrey D. Sommers (1985) broke down the "revision" stage of the writing process into a more complex series of cycles (addition, deletion, reordering, rewording) which can be practiced through SC exercises (p. 151). Russell Hunt (1985) demonstrated that reading one's own writing is a necessary part of the writing process and that SC exercises train students to read their own prose more critically, noticing its form as well as its meaning.

In spite of airing these and other well thought out points, the conference failed to find a single, comprehensive theory that explained *why* sentence combining worked. Strangely, this failure led to a widespread but unsubstantiated rumour that "research has shown that sentence combining *does not* [italics added] work" (Connors, 2000, p. 119). Although some teachers, particularly in developmental and second language programs, continued to use sentence combining, and others tried to update SC exercises by incorporating them into "authentic" creative writing assignments (Phillips, 1996; Strong, 1990), SC was eventually abandoned as a mainstream pedagogical technique.

Problems with Sentence Combining Practice

Pedagogical fashions do come and go, but the special interest around SC means that the reasons for its "going" are worth studying as much as the reasons for its original popularity. One factor in SC's loss of favour might have been its disconnection from the

students' own "authentic" communicative interests. Ideally, for SC to work as part of a "whole language" program, teachers needed to be trained in analyzing and translating student writing into kernel sentences–thus creating "authentic" SC experiences (Coman, 1995). Theoretically at least, such a process would work more closely with students' natural language facilities and become what Vygotsky (1978) called part of a "living written language" that is "relevant to life…[and] meaningful for children" (pp. 105, 118). None of the "whole language" inspired variations on SC exercises went this far; it was perhaps a logistical impossibility in a classroom. It would be interesting to speculate, however, if it might have worked from a cognitive point of view.

More practically, as I speculated in an undergraduate paper, if SC "failed" in classrooms, it was partly because teachers did not allow it enough time. The literature and my own experience had indicated that in order for SC to "work", that is, to effect noticeable changes in writing fluency, students need to spend some hours becoming familiar with it. For example, Strong (1986) agrees with Mellon (1979) that a regimen of "two cued problems daily and two whole-discourse exercises weekly" is ideal because "frequency of practice, more than duration, seems the key to automaticity" (Strong, p. 76). The most impressive results I have witnessed from SC also involved considerable investment of time (see Chapter One). The rapid and dramatic improvement in my students' fluent use of English syntax was more striking than any I have seen achieved through other methods. However, few curricula would allow teachers the flexibility to allot this much time to SC. In my current college classes, my students might spend a maximum of 3 or 4 1 hour classes per term working on sentence combining problems of gradually increasing difficulty. This is not enough time to promote the traditional goal of automaticity in writing highly complex sentences. An in-depth

exploration of how individual students respond to a given SC exercise may have helped to determine whether such limited exposure benefits students at all.

Sentence Combining and Thinking

In several decades, many experts have failed to come up with a comprehensive theory of why SC works, possibly because it works in different ways with different students. Or, as Vygotsky (1978) explained the relationship of learning and development: "development… never follows school learning the way a shadow follows the object that casts it. In actuality, there are highly complex dynamic relations between developmental and learning processes that cannot be encompassed by an unchanging hypothetical formulation" (p. 91). A close-up view of what is going on in different students' minds as they solve SC problems may give some insight into these complex and variable experiences. As Strong (1986) pointed out, there is a "need for more descriptive research to examine stages that students go through in learning from SC" (p. 7). This has been one aim of my study. However, in order to better interpret what my participants may reveal about their thinking as they perform an SC exercise, I first wish to examine what the literature has to say about the cognitive processes involved when students combine sentences.

Sentence Combining and the Way We Learn Language

By the early 1960s, educational theorists were more and more accepting that teaching students traditional grammar did not result in their improved writing, but might even inhibit it (Burkhalter, 1996; Christensen, 1967; ; Hartwell, 1985; Mellon, 1969). Composition teachers turned instead to psychology, drawing on both psycholinguistic and cognitive theory in an attempt to design exercises based on the way we actually learn language. Psycholinguistic theory argued convincingly that most learning of our first language, at least, is unconscious or

"implicit" (Burkhalter) because "human minds are predisposed to figure out how language works" (Strong, 1985, p. 338) and most language learning is a natural development, "integrated, holistic and largely nonconscious" (Mellon, 1981 cited in Strong, 1985, p. 338). At the same time, information processing theory pointed out that in order for us to effectively process the meaning of complex language units with our limited short-term-memories (STM), the actual decoding and encoding involved in recognition or forming of spoken or written words had to become automatic. As Strong put it, the human brain cannot analyze and synthesize at the same moment. Based on these key theories, the new language curriculum attempted to expose students to the structure of the language in less explicit or abstract ways than did traditional grammar, and it also approved of exercises that helped students to reach automaticity in higher level language functions, such as writing complex sentences. Sentence combining met both these criteria.

O'Hare (1971) was the first theorist to openly express the value of implicit learning, based on his own childhood experience in Scotland.

> In a classroom environment where physical punishment for unsatisfactory work was an everyday occurrence and its avoidance an attractive alternative, the student would simply work with what he did know and *use his intuition for what remained.* And he was quite often successful in coming up with the correct answers (p. 26).

O'Hare predicted that his SC problems would work better than Mellon's (1969) because each student "could give his undivided attention to the actual process of transforming by addition and deletion without worrying about grammatical theory" (p. 27). Strong's (1985) subsequent theory of "how sentence combining works" closely resembled constructivist ideals and was

also inspired by the Suzuki method of music instruction: "The essence of successful learning–in tennis or in anything else–lies in 'effortless concentration,' a state of being in which *one is doing, not thinking about doing* [italics added]" (p. 346).

Theorists who advocated implicit learning also supported the goal of automaticity, since this is achieved by repetition and practice, not by studying theoretical concepts. This is why the arguments in favour of building automaticity also drew on sports metaphors: "Football players practice hundreds of plays many times so that at the right time, in the right situation, a dozen or so of these moves will have become both appropriate and habitual. So also with sentence combining" (O'Hare, 1971, p. 31). Later, de Beaugrande (1985) articulated the process in more detail: "By elevating one's awareness, sentence combining might increase the familiarity of syntactic patterns. Then, the structural complexity of the patterns would not create such a heavy load on the writer's limited resources" (p. 71). Although Strong (1985) admitted that this emphasis on concrete experience and practice reduced SC to the status of a skill-building exercise such as you would use to learn to throw a Frisbee (p. 342), he saw its potential to go beyond this, perhaps through collaborative learning(Strong, 1990). How far SC goes beyond mere cognitive or physiological skill building is a point my research may have helped to illuminate.

Sentence Combining and Adult Second Language Learning

Before learning can occur, even if it is described as "unconscious" learning in the sense that it has no explicit "rules," the learner needs, in some way, to notice or be aware of the phenomenon he or she is to process and store in long-term memory. Research by cognitive theorists has shown that this need for conscious awareness may be greater for adults learning a second language than for children learning their first. Schmidt (1990), in "The Role of

Consciousness in Second Language Learning," subscribed to the cognitive psychologists' view that "consciousness is an important concept for the explanation of psychological phenomena," or more specifically that "learning without awareness is impossible" (pp. 130-131). This noticing may be deliberate–something the learner is consciously looking for–or accidental, leading to incidental or spontaneous learning. In a grammar assignment in which a student is asked to look for verb tense, for example, she may also be noticing unfamiliar vocabulary or idioms, and those may in the end become the more valuable "intake" from the exercise than the intended lesson. Theorists have debated how much a learner can control what she absorbs as "intake," especially whether she can process a unit of language for meaning and form simultaneously. Van Patten (1989) theorized that "second language learners must focus on meaning when attending to language input, so they can acquire forms only when processing for meaning is automatic and freed resources can be devoted to communicatively less informative aspects of input" (quoted in Schmidt, 1990, p. 144).

The implications of this possible conflict between processing meaning and form need to be better understood by language teachers. We need to remember that, when reading longer passages, even native speakers pay little attention to the form of the sentences we read because we are focusing on the meaning (Bailystok & Ryan, 1985). This may be one reason why SC exercises can be helpful to ESL students, because meaning is given in small "chunks," so they can more easily focus on form. Thus it assists students with what Merriam and Caffarella (1999) describe as one of the "two major control processes" performed by STM: "organizing the information in groups or patterns" (p. 199). Even if SC is not administered over a long enough time period to promote automaticity in use of those forms, it can draw students' attention to the structure of sentences. Strong (1986) explained this

through the paradox that SC helps students to use complex syntax automatically, but also forces them to pay attention to the structure of language in order to be aware of their options for revising the sentences (p. 6). As well, adult ESL students almost certainly benefit from spontaneous learning of vocabulary and idioms as a side effect of SC exercises, as of most assignments. They may, it is hoped, benefit from awareness of many facets of English.

Once learners notice a language phenomenon, they will relate it to what they already know about the language or about language in general. Such analysis may come easier to people who know more than one language, as Bailystok and Ryan (1985) hypothesized. Whether or not second language learners need to know metalinguistic *terms*, such as "noun" or "subordination" (Burkhalter, 1996, p. 276), they do come to understand metalinguistic *concepts* because they are continually noticing the similarities and differences between their two languages, thus acquiring self-conscious awareness of both meaning and form (Bailystok & Ryan; Hartwell, 1985). For this reason, "speakers of one language who are in the process of learning another language should find metalinguistic problems in that new language fairly easy to solve" (Bailystok & Ryan, p. 239). This is one way that adult second language learners can compensate for their weakening innate grasp of new language (Pinker, 1994). Furthermore, in her study of "Maturational Constraints on Language Learning," Newport (1994) found that for a variety of reasons adult language learners were weaker than children in acquiring word parts (morphology) but could be stronger in more complex, whole-word manipulations such as sentences. This is why SC exercises, which require students to integrate meaning and structure, may draw on the cognitive and metalinguistic strengths of adult ESL learners and may also boost their confidence (Bailystok & Ryan).

These generalizations are borne out in the case of SC exercises by a number of quantitative studies. Klassen (1977), among others, researched ESL students at a Canadian secondary school and found that SC did accelerate their syntactic development (cited by Cooper, Morain, & Kalivoda, 1980; K.E. Johnson, 1992), which follows broadly the same developmental process that Kellogg Hunt (1985) had tabulated for native speakers (cited by Cooper et al. 1980). This benefit may be even more noticeable with adults, who may have progressed to a more advanced level of syntactic understanding in their L1 and also have a larger and more complex network of schemas to build on. In other words, adult learners may benefit from their "expertise" in several aspects of both general and language learning (Merriam & Caffarella, 1999, pp. 204-206). My own informal observations of my students' SC writing also supports this idea of developmental improvement, since adult ESL students not only do well at the exercises, but frequently produce sentences of greater complexity and fluency than those they write for independent compositions. It could be interesting to speculate how far this proficiency is connected to a greater degree of "metalinguistic" understanding, whether or not the students use accepted grammatical terms to articulate their understanding.

Sentence Combining and "Metalinguistic" Terminology

For at least half a century, teachers of writing have debated the merits of teaching some sort of formal grammar to students. Grammarians have maintained that grammar should be restored to its former centrality in the curriculum because students cannot talk about or even think about language with "the necessary categories and labels" (Kolln, 1980 quoted in Hartwell, 1985, p. 106). In response, the "antigrammarians" have pointed to many "scientific" studies that "prove" that teaching grammar does not improve student writing and sometimes

even inhibits it (Hartwell, 1985). They believe, as Neil Postman (1967) wrote in "Linguistics and the Pursuit of Relevance": "Learning how to describe a language is not at all the same as learning how to *use* it with power and discernment" (quoted in O'Hare, 1971, p. 31) and prefer performance to theoretical understanding.

The founders of SC practice were, for the main part, reformers who wished to do without traditional grammar lessons, either like Mellon (1969) choosing a psycholinguistically based "transformational" grammar as his background theory or like O'Hare (1971) wishing to leave out any grammar study altogether. R.A. Hunt (1985) extended this to a constructivist argument: "One reason sentence combining is particularly powerful in improving reading is that it bypasses metalinguistic discourse: it does not require that students learn a language to talk about doing something, but rather allows them to do it first" (p. 166).

Nevertheless, as SC practice became widespread, many teachers have chosen it for its value as part of a traditional grammar curriculum. Zamel (1980) argued that, for ESL students at least, SC lessons that rely on implicit understanding of the language are not enough. She believed that over the course of the SC program, students also needed to be gradually introduced to key concepts related to sentence structure and given a vocabulary with which to talk about the problems as they solved them. Marcella (1993) also saw SC as a method which would help the teacher introduce students to concepts such as fragments and run-on sentences through a sort of discovery learning, with the teacher providing the terms when the concepts arose naturally while the class was solving the problems. He felt that this way students "can internalize the grammatical terminology more easily than if they simply memorize definitions in a text" (p. 7).

There is evidence that, whether or not explicit grammar lessons are involved, SC exercises do help students to avoid sentence errors. Argall (1982), who reasoned that students who are not required to create content are freed to "give full attention to sentence structure, grammar and mechanics and perhaps be taught to detect deviations from standard usage," found that "after five weeks of intensive SC" her students' rate of errors did in fact decrease dramatically (cited in Strong, 1986, p. 9). Others also noted a long-term decrease in sentence error (after inevitable short-term problems as students struggled with unfamiliar structures) (Tanner, 1992), but it is still unclear whether this improvement was due to implicit learning or accompanying lessons in grammatical concepts. Hartwell (1985) believed that most writing errors are "performance" errors, due to overload of STM, not errors of understanding. "Most students, reading their writing aloud, will correct in essence all errors of spelling, grammar, and, by intonation, punctuation, but usually without noticing that what they read departs from what they wrote" (p. 121). With the lighter demands on STM offered by SC and the encouragement to greater attention at the sentence level, students were able to exercise their natural understanding of sentence structure and avoid errors without external teaching of explicit metalinguistic concepts and terms. This theory suggested that, in spite of criticisms by the whole language movement, SC did fit into at least the revision stage of our natural writing process. Whether this is all that SC can do to develop the writing process is another point that needs clarification.

Sentence Combining and the Writing Process

As Strong (1985), one of the greatest popularizers of SC, admitted, "most sentence combining exercises are primitive models of revision and editing, not of invention or drafting" (p. 336). However, as a teacher I feel that revision and editing is the stage of the

writing process in which my students are weakest. Therefore, although I am interested in SC's relationship to the writing process in general, the revising process is worth stressing. This is a process that is widely misunderstood. For example, the writers of the 1982 Harbrace College Handbook, a best-selling grammar text, had little grasp of what psychologists understand to be the "writing process" when they wrote these directions for students editing their papers:

> Before handing in a composition…proofread each word group written as a sentence. Test each one for completeness. First, be sure it has at least one subject and one predicate. Next, be sure that the word group is not a dependent clause beginning with a subordinate conjunction or a relative clause… (quoted in Hartwell, 1985, p. 120)

This is not the way I, or perhaps anyone, edits his or her writing. Strong (1985) more realistically described revising as a "recursive" process which is intertwined with the planning and drafting stages, as the writer is continually rereading and rethinking previously composed text at short intervals (pp. 343-4). Sommers (1985) characterized revising as a series of cycles involving addition, deletion, reordering, and rewording, which is far from being one continuous act (p. 151). He also pointed out that revising is not entirely about form, but also includes meaning. Ideas are subtly changed when they are included in shorter or longer sentences; as one of Sommers' students noted as he compared two versions of his own writing, "those small details are more absorbed into being just details when they are included in the same sentence with the more important stuff" (quoted p. 154), a fair explanation of subordination. Likewise, K.E. Johnson, (1992), who used think-aloud to probe her students' thoughts as I intend to do, discovered that her students did not focus on "cohesive devices" as she had planned but instead spent their time "restating content, constructing meaning and

planning" (p. 71). This suggests that SC involves more facets of the writing process than merely editing and revising. Perhaps the stages of writing are impossible to separate, either in traditional composition tasks or in SC exercises.

R.A. Hunt (1985) emphasized the component of *reading* that is involved not only in SC but in any writing activity. Thus SC, like any reading or writing exercise, is about constructing meaning because "to combine the exercise's kernel sentences into discourses, the students actually had to construct the discourse" (pp. 163-4). Gebhardt (1985) supported the "writing process" as central to composition teaching, but rejected the oversimplified description of this process as three separate stages (planning, writing, and revising) that makes so many "whole language" lessons as artificial as SC is claimed to be. He looked more closely at the interaction of the physiological and psychological processes that occur as writers co-ordinate hands, brains and eyes (p. 206) and concluded that effective writers are producing, analyzing, and modifying their sentences simultaneously, a highly complex task that many inexperienced writers find too difficult, partly because they cannot hold ideas in STM once they have written them down. SC's division of sentences into clauses or "chunks" of meaning can help these weak writers not only to write, but also to read and think about what they have written. On their own, they might decode their writing word by word. SC gives them "the ability to combine many facts and details into fewer generalizations" (pp. 209-12). This is why SC not only models the writing process in manageable doses, but also has been said by many supporters to promote thinking in general.

Sentence Combining and Thinking

In many senses, of course, all writing is inseparable from thinking. Vygotsky (1978) reviewed studies on the attempts of apes to use tools without language and the egocentric

speech used by toddlers as they solve problems and argued convincingly that "speech [by which he meant verbal language in general] plays an essential role in the organization of higher psychological functions," in particular helping the thinker to synthesize a large number of complex ideas (pp. 23, 32). These cognitive abilities, which Strong (1990) labelled the "inner game," also develop as the student matures, in parallel to the "outer game" of language production. O'Hare (1971) and Strong (1986) have maintained that SC speeds the development of the inner "cognitive maturity" that allows students to keep more information in STM at the same time as it enhances the syntactic maturity of the sentences they produce. For this reason, SC may build on the developmental strengths of younger adults and help to counter the deterioration in memory capacity experienced by older adults (Merriam & Caffarella, 1999).

Student thinking also benefits from SC's focus on the relationships between ideas– which is essentially analytical. Syntax, after all, is closely related to logic (Mellon, 1969; Strong, 1985, 1986). Strong (1985) in fact hoped that "attending viscerally to patterns [between kernel sentences] may prepare one to understand those patterns in more abstract, intellectual terms" (p. 345). SC also helps students to accompany the "microlevel" decisions, connected to word choice, spelling and grammar, that dominate STM as we write, by "macrolevel" decisions which look at larger questions of purpose and coherence and which are more connected to synthesis of ideas. To complete Bloom's (Bloom, Englehart, Furst, Hill & Krathwohl, 1956) taxonomy, there are also elements of evaluation in SC, as the writer must make judgments about which words are to be emphasized, which to be omitted, which to be transformed (into pronouns or participles), and which to be subordinated (Gebhardt, 1985).

For all these reasons, it seems inappropriate to dismiss SC as a mere skill-building exercise. It has been interesting to study students employing such higher level thinking.

Conclusion

This catalogue of cognitive and linguistic benefits may make SC seem quite intimidating, but it must be remembered that as they solve the problems, students may no more use the actual terms "pronoun," "subordination," or "analysis" than I did as I composed these sentences. They might even, as I do, regard their SC problems as entertaining word puzzles. This is, after all, what Mellon (1969) originally intended them to be. O'Hare (1971) also promoted SC exercises as "a practical way of activating playful attention to written language" (p. 2). The importance of play as a means of helping learners not only to be more aware, but also to think more effectively, is detailed in Monica Weis's chapter (1985) "Sentence Combining as Play: Preparing for Insight." Play is, after all, the means by which children learn many complex skills they will use as adults, and research has indicated that "play can be an effective means of increasing complex neurological coordination in persons of all ages" (Weis, p. 213). An atmosphere of fun also reduces student anxiety, a concern for all educators of adults since "the level and strength of the [stress and anxiety] reaction increases with intellectual capacity and with age" (Mackeracher, 1996). Finally, the game-like nature of SC surely encourages greater student motivation. As Mellon (1979) wrote, "I have yet to hear reports of student boredom in connection with sentence combining" (quoted in Strong, 1986, p. 18), and my informal observation and questioning of my own students has borne this out. It may even be argued that students' greater motivation may also lead to greater cognitive gains.

This discussion of SC theory has been arbitrarily divided into five sections, but it should not be surprising to find that the various strands of the theory–implicit versus explicit learning and the role of consciousness; metalinguistic understanding and metalinguistic terminology; cognitive theory, linguistic theory, adult learning theory, and the writing process–overlap at many points. Nevertheless, throughout this discussion the connection between thought and language has been a constant, which confirms my belief that introspective or think-aloud research is a very valid method to use if I wish to understand how SC "works" for individual students. The form this research has taken is discussed in the next chapters.

CHAPTER THREE: LITERATURE REVIEW II

Introduction to Think-aloud Methods

Educators today stress our students' need to develop their ability to think and solve problems. Many of us hope to promote this thinking by using constructivist or problem-based lessons in the classroom. But how much do most teachers know about the actual mechanics of human thought processes? How do we know if our lessons truly do develop student thinking? For the past 20 years, psychologists and educational researchers have attempted to answer these questions by using a method called think-aloud to try to see into the minds of students as they solve a wide variety of problems, from mathematical equations to visual puzzles to reading comprehension. Some teachers have also used think-aloud techniques in the classroom as a strategy to promote higher level thinking. Individual researchers and theorists have debated the effectiveness of think-aloud to illuminate thought processes in their particular area of research or pedagogy. However, there have been few comprehensive reviews of think-aloud practices.

As a teacher/researcher who intends to use think-aloud techniques to research the thought processes involved when students combine sentences, I have been reading the literature of think-aloud and have also experimented with think-aloud methods in the classroom. I find it has a fascinating range of applications, but that there are still some directions that have not yet been explored. This chapter will explore think-aloud's roots in cognitive and psycholinguistic theory, its potential as a teaching strategy, and its strengths and weaknesses as a research tool. Finally, it will try to evaluate the most effective combination of method and methodology for my own study, as it looks for answers to several research-based questions:

1. How can I choose a think-aloud task of an appropriate level of difficulty?
2. How far should thinking aloud reflect the language of thought in ESL students?
3. How much can I train and prompt my participants, without distorting authentic responses?
4. How can results from think-aloud protocols be checked and supported?
5. Is think-aloud more suitable for quantitative or qualitative analysis?

The Theory of Think-Aloud

Although think-aloud techniques in their current form have their roots in cognitive psychology, to understand the relationship of thought and words it is helpful to go back to Vygotsky's (1962) *Thought and Language* and its concept of "inner speech." His theory was that the "inner speech" of verbalized adult thought processes evolves from the "egocentric speech" of toddler monologues, also a form of "thinking aloud" with the goal of solving problems. Vygotsky described inner speech as "almost inaccessible to experiments" except through its earlier manifestation as egocentric speech (pp. 131-2), but it is likely that the words adult participants in think-aloud studies utter are closely related to inner speech, especially considering its characteristics. Like egocentric speech, "think-aloud protocols" are "elliptical" in that they are usually not expressed in complete, reasoned sentences. Vygotsky saw that "sentences" in egocentric and inner speech are dominated by predicates since the subject of the "talk" is usually visible and evident to the "speaker," and they may be even more fragmented. Similarly, anyone trying to understand another person's thought processes from think-aloud transcripts will find them more difficult to understand than normal speech or writing, as I found in my classroom experiment (see Appendix B). This is a natural reflection

of the purpose of inner speech, which is not meant to be communicative to anyone but the thinker.

Another important concept from Vygotsky's (1962) theory involves the relationship between abstract thought and inner speech. Although translation into language is necessary before thought can assume a form that others can understand, much of our thought is not "stored" verbally. As we develop and build our mental networks, our thoughts become more abstract, and words are only part of their elaborate patterns of meaning. Vygotsky did not have the vocabulary of information processing theory (long-term memory, storage, and retrieval) to clarify these concepts, but they are important to an understanding of what think-aloud can and cannot reveal. A researcher needs to be aware that even thinking aloud that makes inner speech external cannot reveal deeper thought processes in their true complexity because they have to be simplified into words before anyone, even the thinker herself, can really know them. This "bottleneck" between the breadth of abstract thought and the narrower, temporal emergence of verbal thought necessarily slows down thought processes. We cannot know for certain how much it also changes them before they are verbalized as "inner speech" which can be thought aloud.

> A speaker often takes several minutes to disclose one thought. In his mind the whole thought is present at once, but in speech it has to be developed successively.... Precisely because thought does not have its automatic counterpart in words, the transition from thought to words leads through meaning... and then through words. (Vygotsky, 1962, p. 150)

Vygotsky's (1962) understanding of the complex and dynamic relationship between thought and verbalized inner speech is useful to remember when studying the theoretical

underpinnings of think-aloud methods in the more simplified models of information processing theory, best explained in Ericsson and Simon's (1980) seminal study, "Verbal Reports as Data."

Ericsson and Simon (1980) stressed the importance of the theoretical basis of think-aloud and related "introspective" research techniques. Their theory was based on a distinction between working or short-term-memory (STM), in which concurrent reasoning takes place in verbal form, and long-term memory (LTM), where some of the ideas from STM are eventually stored, not necessarily in words. The goal of think-aloud is to give the researcher insight into the processes of STM, but there are several difficulties that we need to be aware of. First of all, only "heeded" or noticed information goes into STM. Also, since STM has a limited capacity, this information is held there only briefly and can disappear as soon as new thought patterns supersede it. For this reason, only verbal reports that follow very rapidly after a thought process can be supposed to accurately reflect STM processes, and researchers must focus on the participant's "immediate awareness," not a delayed explanation for his actions (Cooper, 1999, p. 241; Olson, Duffy & Mack, 1984, p. 254). Also, there are many thought processes that are not verbalized in STM, either because they are automatic (such as recognition of familiar words and images) or because their "intermediate" processing passes through so quickly that there is no time to verbalize it (Davis & Bistodeau, 1993, p. 460; Ericsson & Simon, 1980, pp. 223, 237-8; Sugirin, 1999, p. 13). For this reason, the researcher needs to choose the research task very carefully. Ideally, he should aim for what Ericsson and Simon call "Level 1 verbalization" or think-aloud of processes which are naturally verbal, perhaps corresponding to Vygotsky's "inner speech." Processes which are not verbal, such as those involving physical actions or visual images, may be distorted when they are translated

into words to meet the demands of a think-aloud task. Ericsson and Simon refer to a visual-spatial puzzle-solving study in which the group asked for "overt verbalization" of their strategies was more successful in solving the problem than a control group. Unfortunately, this implies that Level 3 verbalization might not represent natural thought processes, but instead enhances them, at least in this specific case.

Ironically, the possibility that think-aloud methods may enhance thought processes makes them problematic for researchers but attractive to teachers. The literature on think-aloud as a pedagogical strategy shows how far it can promote, rather than merely report, thinking.

Think-Aloud as a Teaching Strategy

Thinking aloud as a way of modeling learning and problem solving strategies is a well-established teaching method when it is performed by the teacher in front of the whole class. Mowey and Conahan (1995), in their teaching guide *Reading/Writing Comprehension Strategies*, claim that think-aloud techniques can also benefit students working individually, in small groups, or as a whole class. Because think-aloud slows down thought processes, it makes students more aware of both their own reasoning and that of others. According to Mowey and Conahan, it can help students to retrieve prior knowledge, understand new concepts, develop new problem solving strategies, paraphrase and predict more successfully, and be more aware of their metacognitive processes, to list just a few of its advantages. Think-aloud activities also aid assessment by providing teachers with feedback on individual response to their lessons.

Other literature explains why some of these advantages may be possible. Cullum (1998) speculates that think-aloud aids reading comprehension because it helps the reader to

elaborate on her connections with prior knowledge, it requires the reader to hold text in working memory longer so that more of it is likely to pass into LTM, and, in group contexts, it boosts a reader's confidence by giving importance to her unique thoughts instead of those being sought by a teacher. Liaw (1995), one of the first to use think-aloud to teach ESL students, found think-aloud aided reading comprehension because it encouraged students to focus on the meaning of the text as a whole instead of individual words, so that they did more predicting. It also promoted awareness or noticing of details, which brought them into STM, and its focus on the metacognitive helped ESL students to develop greater automaticity in comprehension processes.

Lochhead (2000) has developed and marketed an instructional process called "Thinkback 2000," by which students perform think-aloud tasks in pairs, taking turns acting as "problem solver" and "listener." The goal of this process is for students to eventually internalize (transfer to inner speech) the type of questions and answers that they practice aloud in the classroom. This will promote "reflective thinking" so that students are more aware of and critical of their own thought processes and gain a larger repertoire of heuristics to address future problems.

Because "Thinkback 2000" was the teaching strategy the literature described in greatest detail, I tried it with my class as part of a lesson in sentence combining. Although my students did not follow the method in the disciplined manner I had demonstrated to them (see Appendix B for details), I was impressed by their degree of engagement, and by the wide range of thought processes that they demonstrated. Think-aloud appeared to add to the challenge of sentence combining and enrich the activity significantly. In order to be understood by their partner and by me, all students thought aloud in English. It would be

interesting to inquire whether "thinking *aloud*" in English encourages ESL students to think *internally* in English, a necessary step towards fluency. Unfortunately, this may be less desirable in a research context, as a requirement to "think" in English may distort participants' natural thought processes.

Clearly, then, think-aloud has the potential to enhance student thinking, and the more time they spend on it, the more likely they are to improve. This is why researchers who want to use it to reflect natural thought processes have to design their methodologies with great care. There are a number of problems to consider when you use think-aloud for research.

Think-Aloud as a Research Tool

My classroom experiment showed me, more clearly than paper and pencil assignments, how complex sentence combining activities could be. A deeper, more structured study using think-aloud has led to further insights. Olson et al. (1984) state that think-aloud is one of the most effective ways to assess higher level thinking processes (those that involve STM) and that it could also be used to study individual differences in performing the same task. Ericsson and Simon (1980) conclude that even if their view of thought processes is necessarily incomplete, verbal reports such as those from think-aloud are a "thoroughly reliable" source of information about thought processes (p. 247). Nonetheless, before I could design a methodology that involved think-aloud, there were a number of problem areas I needed to address. These included the type and level of difficulty of the research task, the language of think-aloud for bilingual students, the degree of teacher/researcher prompting that is appropriate, the use of other data to support inferences from think-aloud protocols, and the methodology of analysis.

Suitable Tasks for Think-Aloud

Akyel and Kamisli (1996) recommend that think-aloud tasks for ESL students require "cognitively demanding language use" beyond mere word recognition level so that participants cannot rely on automaticity to perform the task (pp. 15-16). On the other hand, Qi (1998) found that bilingual students faced with very high cognitive demands rely more heavily on thought processes in their first language (L1), while they are able to think more in English for lower level cognitive processes. Since the requirement to translate thoughts not only from LTM into language but also from one language to another slows down and possibly distorts thought processes, it is better to choose a task that permits English thought as far as possible. Ericsson and Simon (1980) also found that a high cognitive load interferes with verbalization even in unilingual subjects, because other processes crowd verbal information out of STM. For all these reasons, sentence combining at an intermediate level of difficulty is probably an appropriate task for think-aloud because it requires more than automatic cognitive response but can be worked on one clause at a time to avoid overload of working memory (STM). Most of all, it employs verbal thoughts naturally and so should meet the requirements for Ericsson and Simon's Level 1 verbalization.

Language of Think-Aloud

Rankin (1988) was the only theorist I have read who recommended that bilingual participants be required to think-aloud in their second language. He argued that switching languages complicates the response to the task by adding strategies such as translation that would not normally have been part of thought processes. However, the majority of researchers believed that allowing participants to think-aloud in their L1 provides a more natural picture

of their inner speech. Davis and Bistodeau (1993) argued that reporting in their non-native language may cause participants to express thought sequences incorrectly, or even to avoid expressing them at all because of the difficulty of translating them. Gibson (1997) felt the same after finding that most of his ESL participants preferred to think in their L1. Qi (1998) addressed the question of "language switching" in greater detail and related it to different types of cognitive demands. According to the theory of "compound bilingualism," bilinguals may have "shared" schema to represent concepts in LTM, equally retrievable through both languages. The competing theory of "coordinate bilingualism," on the other hand, hypothesizes a separate retrieval route for each concept depending on the language of thought. Qi saw these two hypotheses not as opposites but as different stages in a learner's development towards L2 proficiency. According to him, a fluent ESL speaker may use a direct connection from an English word to its LTM schema, but a less fluent speaker, or one who is facing more complex cognitive demands, is more likely to need a longer route involving translation in lexical memory and retrieval through the L1 word. Therefore, to insist that a participant think-aloud in his L2 may force him to use an unnatural retrieval process. Vygotsky (1962) also stated that L2 learners develop formal, external speech forms before they can produce spontaneous, fluent, presumably internalized speech. If this is true, fluency in speaking or writing is not necessarily an indication of the language of an ESL student's inner speech. Clearly, then, my study would be more accurate if it kept the language of think-aloud open, so that bilingual students may "switch" languages aloud as naturally as they do in their inner speech. The problem of translating L1 "protocols" or transcripts may be addressed at the "retrospective" stage, to be discussed in a section below.

Teacher/Researcher Prompting

The teacher modeling and practice sessions recommended by theorists of think-aloud as a teaching strategy (Lochhead, 2000; Mowey & Conahan, 1995) are more problematic when applied to think-aloud as a research tool. Ideally, the student should not need any coaching but should enunciate his inner speech spontaneously. Unfortunately, as my classroom experience showed, without some demonstrations and practice, students may not report their thought processes frequently or thoroughly enough to meet the researcher's needs. Nonetheless, some research methods that tried to improve their data by suggesting explicit strategies for students to talk about (Cooper, 1999; Davis & Bistodeau, 1993) or asking specific probing questions (Olson et al., 1984) ran the risk of "leading the witness" and so distorting thought processes more than necessary. Furthermore, Ericsson and Simon (1980) found that repeated practice of a task might promote automaticity before the STM processes could be reported. My own experience confirms this, because when I was modeling sentence combining to my second class, I found I had automatically used solutions I had worked out more slowly in the first class (Appendix B).

Some suggested strategies to encourage effective think-aloud seem less intrusive than detailed practice or explicit modeling. Sugirin (1999) used a KEEP TALKING sign so that the researcher could remind a student to verbalize all thoughts without addressing her in speech that might interfere with those thoughts. Gibson (1997) suggested a pretask orientation session that briefly explains the rationale and form of think-aloud to reduce "cold start effect" (p. 58), but thought that researcher modeling might introduce bias into "think-aloud reporting." My participants have had practice in sentence combining but may have little or no

experience with "thinking-aloud." All the same, I wished to keep their think-aloud behaviour as natural as possible, even if it meant that the degree of information varied among students. This may have been less of a problem because the "data" were interpreted qualitatively (see section below) and may have revealed interesting insights into individual differences in thought processes. Any shortfall in the think-aloud results were also supplemented by other sources of data gathering. As Sugirin pointed out, it is necessary to have a "reliability check" on the content of verbal reports, to provide "triangulation" (p. 2).

The Need for "Triangulation"

Few researchers in the think-aloud literature relied on think-aloud as their only source of data gathering. As Ericsson and Simon (1980) stressed, think-aloud data from STM will always be incomplete and exclude a number of thought processes which are not held in STM long enough to be expressed verbally. Think-aloud utterances may also vary in quantity and quality. In response to these problems, the most widely used follow-up strategy is retrospective questioning. Although this involves difficult retrieval from LTM, and may be biased by researcher questioning, Nunan (1992) concluded that these problems are offset when combined with the concurrent STM data. When retrospective questioning is used only to illuminate and expand on think-aloud results, it may add depth of information about the participant's thought processes. Rankin (1988) also recommended a retrospective analysis, particularly for those participants who had difficulty with the think-aloud method. Qi (1998) suggested that a follow-up interview may also allow the participant to "validate" the researcher's interpretation of her think-aloud utterances; this would be particularly important in my case when some of those utterances may be in the participants' L1. Davis and Bistodeau (1993) used both a "recall protocol" focused on the content of the task (reading

comprehension) and an "exit interview" to help interpret the think-aloud data. However, Gibson (1997) warned that it is better to let the participant recall the task as far as possible without using the audiotape as a prompt. He also noted that retrospective data are most reliable when the time lag between think-aloud and exit interview is very short. Obviously, then, there was no time to transcribe the audiotapes, and since L1 utterances would have to have been played back in full, my exit interviews had to take place almost immediately following the think-aloud sessions.

There are a number of other strategies for data collection suggested by the literature. Akyel and Kamisli (1996) supplemented their think-aloud data with a questionnaire. Some of the studies reviewed by Ericsson and Simon (1980) involved control groups which performed the same task without think-aloud reporting. However, there are so many potential causes of variations in think-aloud response that a test group/control group dichotomy is of limited help. Although some researchers have used videotaping as a clue to participants' physical action during think-aloud, Sugirin (1999) preferred casual researcher observation because it was less intimidating to the participants. Cullum (1998) listed a number of nonverbal cues which a researcher may note quietly; these include pauses, smiles, misreadings, and periods of silence that may indicate STM overload.

In my own classroom experiment, I found informal observation gave me valuable insights into different student responses to the think-aloud task (see Appendix B). This is why I decided to collect my data by audiotaping a participant's think-aloud utterances while sitting next to, not across from, him to minimize intimidation (Nunan, 1992) and taking informal written notes on his behaviour and tone of voice, trying to relate them to his progress throughout the task. I then could play back any L1 passages in the tape as part of the exit

interview, adding translations of L1 utterances and student explanations of English passages, pauses, and other nonverbal responses to my notes. With this raw material in hand, I could then address the most challenging stage of the think-aloud research process: interpretation.

Interpretation of Think-Aloud Data

Since it would interrupt the natural flow of "inner speech" to ask participants for explanations of their actions during the think-aloud, and explanations given retrospectively are unreliable because they might not reflect STM (Ericsson & Simon, 1980), the researcher must be prepared to make her own inferences as she interprets the think-aloud data. As I found in my own classroom experiment, many student utterances are ambiguous; they may repeat a phrase using various intonations as they speculate about a way to reword it, but they do not articulate this speculation. Other theorists also pointed out the need for researchers to make inferences (Davis & Bistodeau, 1993). Although Rankin (1988) warned that any reconstruction of participant remarks should be "literal" and related closely to context, he admitted that some responses may represent more than one thought process and need to be interpreted as such. Olson et al. (1984) described their "impressions" of common participant responses (p. 265), which also involved inferencing. They referred to this as the "qualitative" part of their data.

In general, though many researchers used inference in describing and classifying their data, only one of those whom I studied used a completely qualitative approach (Cullum, 1998). Is this widespread preference for quantitative analysis a reflection of the time period of many of the studies (1980s and early 1990s) or an indication that think-aloud is more suitably analyzed this way?

Of course, a quantitative study can claim to be objective. In the early years of think-aloud research this was necessary for cognitive psychologists who were challenging the dominant behaviourist requirement for "observable behaviours" (Nunan, 1992, p. 115). Ericsson and Simon (1980) gave think-aloud respectability by arguing that researcher inferences about the meaning of think-aloud utterances are as objective as behaviourist inferences about the purpose of visible actions. But, in the end, how objective can any of these quantitative analyses be? As an example of quantitative analysis which is closest to my own research topic, K.E. Johnson's (1992) process-oriented study of ESL students combining sentences deserves a closer critique.

Like the other researchers, K.E. Johnson (1992) used a limited number of participants (9), presumably because think-aloud procedures are so time consuming. All participants took part in individual sessions that included think-aloud practice with some teacher modeling; then they completed an audiotaped think-aloud protocol while they solved eight sentence-combining problems of varying difficulty. There was no exit interview, and the researcher disregarded pauses, "false starts," and other observable behaviours (p. 65). When the tapes were transcribed, participant utterances were divided into "communication units" equivalent to grammatical sentences: "a main clause and all the subordinate clauses attached to it" (p. 65), which correspond to the psycholinguistic concept of the "T unit" or "minimal terminable unit" of meaning (Cooper, 1999, p. 242). These units were then tabulated under one of 10 possible "cognitive strategies" and statistically analyzed to find which strategies were most frequently used and how the different levels of difficulty affected choice of strategy. The results are plausible and useful, but, as many other quantitative think-aloud researchers also admitted, "limited because of the small sample size" (K.E. Johnson, p. 71). Furthermore, there

are other problems with this methodology. Given that inner speech is "elliptical" or telegraphic, forcing students to produce complete sentences or artificially joining fragmented utterances into grammatically complete "communication units" may lead to misrepresentation of thought processes. Also, assigning each "communication unit" to one cognitive strategy oversimplifies the process; in reality, one utterance may reflect a more complex combination of strategies (Rankin, 1988). Finally, a research hypothesis that looks only for evidence of thought processes common to all participants disregards the existence of different thinking styles (see, for example, Merriam & Caffarella, 1999, pp. 211-212), in addition to different learning styles and intelligences. If only one participant uses a specific strategy to solve a problem, are his data less relevant than those of the others?

For all these reasons, the depth, variety, and complexity of thought processes may be as effectively interpreted using a qualitative approach. Rankin (1988), although his own analysis is quantitative, suggested treating each think-aloud participant as a "small" "tightly focused" case study (p. 122). I agree that a case study approach may be appropriate, but that those case studies could be qualitative rather than quantitative, interpreting the results from a more naturalistic, holistic, or even phenomenological point of view (Stake, 1994). Such an approach may give the researcher greater flexibility to describe her results naturally, without having to tailor them to a preconceived hypothesis, and to draw inferences from whichever source, think-aloud transcripts, exit interview or informal observation, is most revealing.

This is what Cullum (1998) did in her descriptive, in-depth study of her daughter's experiences using think-aloud techniques to encourage her success and enjoyment in reading. This qualitative approach enabled Cullum to describe her subject, Annie, in great detail, making her family background, personality, and interests clear to the reader. It also gave a

detailed picture of the reading environment and a nuanced narrative of the changes Annie experienced through the course of the think-aloud experiment, which took place over several days as she read and responded to one book. This experiment did not pretend to be generalizable, for if a different child were exposed to the same experimental process, it is highly unlikely that the results would be the same. This does not negate the validity of Cullum's study and its findings that Annie did in fact benefit from think-aloud in a number of significant ways.

Unlike Cullum (1998), I studied 5 participants so that I could observe a wider range of participant responses. If Cullum's paper described a single case in depth, mine would be a "collective" case study. Both studies are "instrumental," designed to provide better understanding of an educational issue that is not confined to the case itself (Stake, 1994, p. 237), albeit with the understanding that individual responses are unique. In order to get some sense of the complexities of each participant's situation, I included questions about his or her background and interests in a preliminary interview, treating each as a distinct individual, not merely a representative of a group. In describing each participant I modeled some of my writing on Cullum's narrative style. Furthermore, unlike K.E. Johnson (1992), I have made few explicit comparisons, interpreting each participant's data largely independently of the others' and allowing the reader to make her own inferences from the detailed narrative. I have also described participants' think-aloud utterances and nonverbal responses as they appear, without trying to classify them into hypothetical categories. It is also important to take into account the participants' own perceptions of their thinking (Firestone, 1987). Thus, by allowing participants to listen to their audiotaped utterances, if applicable, and to read and comment on my informal observations, I have enlisted them as coresearchers who could make

a valuable contribution to our understanding of the interplay of thought and language. This way I have used a similar task and similar subjects to K.E. Johnson's study, yet gained new insights by looking at the results through a different, qualitative, lens (for further discussion of this point, see Chapter Six).

Conclusions

In general, the literature of think-aloud research shows its strong theoretical foundation and confirms its value as a way of exploring individuals' thought processes. Many studies also provide helpful ideas about the design and implementation of experimental studies. Based on my findings from this literature, I feel confident that my choice of task (intermediate level sentence combining) has provided an effective level of cognitive challenge, that my "open" approach to the language and content of think-aloud reporting has helped to ensure authenticity, and that any weaknesses in the quality and quantity of think-aloud utterances have been compensated for by "triangulation" involving informal observation and an in-depth exit interview. However, the literature's emphasis on quantitative analysis is less persuasive. As previous researchers have found, looking for consistent mathematical patterns among statistically insignificant numbers of participants is limited in its usefulness and overlooks the possibility of individual differences. By interpreting think-aloud results as part of a qualitative rather than quantitative study, I have attempted to take think-aloud research in a new direction, one which may also prove fruitful for other researchers in the future.

CHAPTER FOUR: METHODOLOGY AND METHOD

Choice of Method

As discussed earlier, introspective research methods such as think-aloud seem highly suitable for qualitative study. Previous think-aloud studies of language skills in general and sentence combining in particular have used a quantitative methodology and have sought to generalize the experiences of certain populations of students. It may be equally valuable, however, to avoid such generalization and instead allow a picture of the variability of individual experience to emerge. Such a "subjective" approach requires information on "what concerns or occurs to the *individual* subject and his experiences, qualities and dispositions" (Scriven, 1971, quoted in Lincoln & Guba, 1985, p. 292), hence a qualitative lens. However, since qualitative methodology extends over a wide spectrum of methods, I have sought to narrow my choice of method further.

Quantitative researchers, such as K.E. Johnson (1992), have sought to generalize their subjects' experience by codifying their utterances and identifying numerical patterns amongst them. I would prefer to describe rather than codify, hoping to provide "sufficient descriptive narrative so that readers can vicariously experience these happenings, and draw their own conclusions" (Stake, 1994, p. 243). There are several qualitative formats that provide scope for such "thick description." Narrative methods such as phenomenology provide some of the tools needed to draw a detailed picture of a participant's experiences, but although I intend to set my interpretations within the context of each participant's own life story (her language background, her educational experiences), I will be asking less the narrative question–"what happened"–than the expository question–"how does it (language) work?" The method that

seems flexible enough to accommodate such a blending of interpretive angles seems to be that of case study:

> A pragmatic justification emphasizes the applied nature of case study research. As a method it can be advocated on grounds that it is more useful, more appropriate, more workable than other research designs for a given situation. Knowledge produced by case study would then be judged on the extent to which it is understandable and applicable…a pragmatic conception of truth undergirds this approach. (Merriam, 1988, p. 20)

According to theorists of qualitative methodology, case studies can be non-experimental "when description and explanation (rather than prediction based on cause and effect) are sought" and when "it is impossible to identify all the important variables ahead of time" (Merriam, 1988, p. 7). Case studies do not need to be guided by social science or other theories, although theory may be used "to guide the study in an explanatory way" (Creswell, 1998, p. 87). Case studies also can deal with a wide variety of data sources, including "documents, artifacts, interviews and observations" (Yin, 1984 quoted in Merriam, p. 8), and employ "any and all methods of gathering data, from testing to interviewing" (Merriam, p. 9). Most important, descriptive case study also allows the researcher to "illustrate the complexities of a situation,…show the influence of personalities, [and]… include vivid material – quotations, interviews…and so on" (Olson, 1982, quoted in Merriam, p. 14).

Although the typical case study involves in-depth and possibly lengthy observation of one participant or situation, what Stake (1994) designates "collective case study" appears to fit my goal of describing in some depth the situation and experiences of a small number of participants. This would also be an "instrumental case study," one which is designed "to

provide insight into an issue or refinement of theory," but also one that is "extended to several cases." The choice of the cases need not necessarily be deliberate. "They may be similar or dissimilar, redundancy and variety each having voice. They are chosen because it is believed that understanding them will lead to better understanding…about a still larger collection of cases" (Stake, p. 237). With this method, then, it was possible to be quite open in the selection of participants for research.

Selection of Participants

Since I am a teacher and, in an effort to reveal the "human dimensions" of an educational problem (Soltis, 1990, p. 251), I required human participants, there are certain ethical concerns I had to face. The greatest of these was the fact that education "has become hierarchically defined and evaluation based" (Dalton, Lantaigne-Richard, & Quattrocchi, 2000, p. 162) so that I, who evaluate them, am in a position of power over my students. Even if I had insisted that participation in my study is voluntary, some students might have experienced "fear of reprisal" either if they did not volunteer, or if they volunteered and were inadequate in some way (Dalton et al., p. 162). For this very significant reason, I chose not to enroll my current students as participants. In deciding on an alternative source, there are several facets of the interviewer-participant relationship I took into account.

"Perception in research…is a challenge to one's imagination," often requiring the researcher to set aside her usual "lens" and see familiar people in a new way (Peshkin, 2001, p. 242). In my cases, I needed to view my participants not as teacher to student but as researcher to coresearcher. This could not be a neutral or objective role. In qualitative case study in particular, the researcher is the "human instrument" whose point of view is central to the understanding of the experiences studied (Merriam, 1988). Ideally, the researcher should

be an "insider," but as I am a teacher at Seneca College, which was the location of this study, and my participants are students, insider status was not possible. Instead I hoped to position myself as "someone familiar" whom my participants already knew and trusted (Tilley, in press, p. 2). This is why I approached *former* students, people who knew me and perhaps felt comfortable working with me but over whom I now had no power. I had email addresses for some 180 students whom I had taught between the fall of 2001 and the summer of 2002, many of whom were still attending the college. From these, I hoped to recruit 6 participants, and did in the end recruit 5. And although the 180 students included people from many groups recognizable by age, gender, nationality, language, or educational background which might be interesting to select for study, there are good reasons why my recruiting was completely open.

Qualitative research is most effective when the researcher "develops categories from informants rather than specifying them in advance of the research" (Creswell, 1998, p. 77). This is because the naturalist understands that every research subject is unique, and thus "the concept of 'population' is itself suspect" (Lincoln & Guba, 1985, p. 298). This means that even if all my participants had turned out to be, say, female Chinese university graduates in their early 30s, there still might have been great variability in their experience. Furthermore, if an Iranian man and a Romanian woman had used different approaches to the same problem, how could I have determined whether that difference was due to their nationality, language background, gender, or some completely different factor, such as learning style? It was more important to have participants who were interested in the study and willing to help me explore their writing processes as coresearchers. In the end, I sent an email message (see Appendix C) inviting participation to all the 180 students, indiscriminately, knowing that whomever I worked with would have something worthwhile to reveal.

Pretesting of Think-Aloud and Sentence Combining Task

The role of sentence combining theory in my choice of task is discussed in Chapter Two, but there are also considerations related to methodological theory. First of all, from a purely practical point of view, since my participants would be former students it was important that I chose a sentence combining exercise that I had never given in class. This necessity gave me a helpful opportunity to gain insight into the sentence combining and think-aloud processes. In ethnographic observation, it is necessary to strike a balance between a knowledgeable "insider" and more open "outsider" point of view (Spradley, 1980). Because the exercise selected for the study was new to me as well as to my former students, I had an opportunity to briefly experience an "insider" point of view as I solved the chosen sentence combining problems myself before I evaluated my participants' solutions. This way I might do what sociological researchers recommend and "take 'the role of the other'" (Peshkin, 2001, p. 243). I also treated this as an opportunity for introspection, keeping a reflexive journal of the experience, and even audiotaping my thoughts, so I could "use [myself] as a research instrument" (Spradley, p. 57), "providing the same kind of data about the human instrument that is often provided about the paper-and-pencil or brass instruments used in conventional studies" (Lincoln & Guba, 1985, p. 327).

Accordingly, once I had tentatively selected four sentence combining problems (see Appendix A) I sat down with a tape recorder and timer and solved them while "thinking-aloud." After each problem, I wrote brief journal notes on my impressions. This done, I transcribed my think-aloud tapes, noting pauses and intonation as I intended to do with my participants. The resulting transcription, journal entries, and notes on the sentence combining, think-aloud, and transcription processes are contained in Appendix D.

This introspective experience was very rewarding, giving me potentially valuable insights into the strategies I use to combine sentences, the language I use when compelled to think-aloud, and the difficulties and limitations of transcription. The knowledge gained from this test also contributed to the design of method for the participant interviews.

Location of Interviews

All other things being equal, naturalistic research should be sited in its natural setting (Merriam, 1988), and in educational research that natural setting would be the classroom. However, there are several reasons why it was impractical to perform this study in an actual classroom. In my previous experiment testing think-aloud in the classroom (see Appendix B), I found that it quickly became too noisy to hear what was said if more than one student were speaking at once. It is only practical to audiotape think-aloud in a one-on-one situation. Also, since it would be ethically uncomfortable to use current students as participants, I worked with former students with whom I no longer shared a classroom. Perhaps meeting them in a nonclassroom setting might have helped them to see me less as a teacher and more as a research colleague. Since the participants are Seneca College students, however, I held the interviews at the college. Instead of classrooms, I used small seminar rooms off the main Learning Commons. Isolation is a necessity when capturing one person's thoughts and story on audiotape, but because the rooms had glass doors and windows I was able to enjoy privacy while minimizing any feeling of personal threat. Finally, in order to appear less authoritarian, I sat at the semicircular table *beside* the participant, with the tape recorder on the table in front of us, with a copy of the exercise in front of me, against which I was able to take unobtrusive "field notes" (Nunan, 1992).

One other issue relating to the location of the study is the anonymization (or not) of the location of the study. Throughout this text I have named actual colleges I have worked at and courses I have taught. Considering the very large number of students at Seneca College, there is no reason why my naming the college should seriously threaten my participants' anonymity. Furthermore, in "Anonymity and Place in Qualitative Inquiry," Nespor (2000) argues that trying to hide the identity of the institution you are writing about lessens the complexity and realism of your description, assumes that any data you gather at that one place is generalizable to all comparable places (such as community colleges), and, in the case of more public research, lets the institution "off the hook" from considering any possible changes you may suggest.

This is why, while I asked my participants to provide pseudonyms and did not transcribe any proper names that came up during the interviews, I have not concealed the location of the study or the names of the courses with which it is principally concerned. After all, one of the purposes of educational research should be to provide insiders such as students with a "voice" in the development of the policies and theories that shape their education (Howe & Moses, 1999, p. 38). As Nespor (2000) states: "Anonymizing the location of the work would undermine its usefulness for informing public debate and policy on problems specific to those settings" (p. 554), which is not in the interests of the participants. Ethics demand that participants should not receive any tangible reward for their time and effort, so it is important that they benefit, as far as possible, in less tangible ways. Throughout the interviews, I have tried to bear in mind this principle of "reciprocity" (Dalton et al., 2000, p. 159).

Interview Sequence

Backgrounding

Before placing participants in the relatively stressful situation of performing a task while "thinking-aloud," I gave them a chance to feel more comfortable with me and with the audiotaping by asking them to talk about themselves. Their narrative helped to give me a general picture of their language and educational background. This part of the interview was, as far as possible, open ended, although there are some key facts which I felt it necessary to elicit from their conversation, preferably indirectly but often through direct questions (see Appendix E). At all times I treated each participant as an individual, fellow adult, and co-researcher, aiming for "the establishment of a human-to-human relation with the respondent and the desire to *understand* rather than to *explain*" (Fontana & Frey, 2000, p. 654).

Think-Aloud Recording

As explained in the previous chapter, I hoped to receive a more "naturalistic" picture of participants' responses to the think-aloud task by avoiding any sort of detailed practice or demonstration, but I did at this point explain what the process was and what it was supposed to reveal, allowing a brief trial run with a simple SC exercise. I tried to make it clear that the participants should speak aloud whatever words were in their mind, in any language. I showed them the prepared "Keep Talking" sign and explained why I didn't want to interrupt with oral questions. As Susan Tilley (in press) explained of her prison interviews, which were often interrupted by intercom announcements:

> To continually request that they speak up was extremely disruptive and stressful for some of the interviewees…so I decided it was better to lose words

> and parts of sentences on transcripts than to continue to request an increase in volume (p. 6).

Similarly, I would rather leave thoughts unarticulated than distract my participants from their natural thinking processes.

I also let the participants know that I would be taking some notes of their visible actions such as pauses, the meaning of which we could discuss later. Like Sherlock Holmes's dog that did not bark in the night, or Eisner's (1979) "null curriculum" of what is not taught in the schools (cited in Peshkin, 2001, p. 247), analyzing what is not said might add a lot to my understanding of the interview transcripts, and help me "to visualize what…students are not hearing in their classrooms…" (Peshkin, p. 247). Fontana and Frey (2000) also pointed out the need for an interviewer to notice not only the participant's choice of verbal language and terminology, but also his nonverbal communication: what Gorden (1980, cited in Fontana & Frey, pp. 660-661) called "*chronemic*" (pace of speech), "*kinemic*" (body movement) and "*paralinguistic*" (variations in vocal tone and volume). In order to report this information as clearly as possible, I had a copy of the sentence combining exercise in front of me, widely spaced, so that I might coordinate my field notes to the participant's stage in the task. I also allowed space to note the starting and finishing time for each of the four problems, but emphasized that there was no pressure to complete the exercise in a short time. Although Peshkin recommends that researchers take note of the "duration" of what they are observing, there are so many potential factors affecting participants' speed of completion that it would have been worthless to generalize from them.

Reviewing for Transcription

Researchers have not normally involved their participants in the transcription process, apart from giving them completed transcripts to approve. My decision to allow participants to listen to a "play-back" of the tapes was based on the necessity that they translate any think-aloud utterances in their original languages, but there might have been other benefits. Only recently, methodological theory has inquired about the epistemological and ethical limitations of transcribing others' words; by allowing my participants to have a part in the interpretation of their own comments I hoped to avoid some of these limitations, in particular the potential for researcher bias which is unavoidable in qualitative research (Soltis, 1990). As teacher-researcher, Jane, found:

> My main reason for adopting a reflexive, self-checking approach through involving students as co-researchers was my belief that one cannot truly be an observer in a situation without being implicated in the activities and actions of the whole. When one is observing, the vision that is generated is always filtered through the lens of the observer. In addition, I could not be sure if suspicions about aspects of learning that I observed were "real" without checking them with the student-learners. (Dalton et al., 2000, p. 153)

Hard as it may be for a researcher to keep her "field" observations open and unbiased, it is even harder to reproduce the participants' point of view when playing back a tape some time later and in a different location. During my introspective think-aloud practice, I found that I could not remember exactly what I had been thinking (STM) even while transcribing my own words less than an hour after I had spoken them (see Appendix D). Clearly, researchers need to be aware of the artificiality of the transcription process, which attempts to

translate an oral, synchronous conversation between two people into a written, asynchronous piece of writing composed by one person (Kvale, 1996). "Regardless of the specifics of a research program, if transcription is involved, explicit conversations between researchers…and others involved in the transcription process, serve to interrogate the transcription process in comprehensive ways" (Tilley, in press, p. 8). Susan Tilley had found her interpretation of her interviews enriched by the comments of the woman she had hired to type the transcripts. In my case, bearing in mind that "the meanings of questions and responses are contextually grounded and jointly constructed by interviewer and respondent" (Schwandt, 1997, quoted in Fontana & Frey, 2000, p. 663), I predicted that further discussion with my participants at the beginning of the transcription process might also contribute to a better rounded interpretation. The playback of the interview could be a wonderful opportunity to let my participants add to any comments they had made earlier, interpret not only first language but also ambiguous English utterances, provide further feedback about their impressions of the various problems, and speculate about the reasons for their silences. Finally, it has given me a chance to ask them informally about their impressions about the whole interview and think-aloud process.

Follow Up Meeting

Kvale (1996) pointed out that "analysis of the transcribed interviews is a continuation of the conversation that started in the interview situation" (p. 280), and it makes sense for the second party in the conversation to have his voice included at the analysis stage too. Once I had typed the transcripts of the interviews, a slow process that I necessarily performed alone, I attempted to narrate and interpret them holistically, joining together the participants' words and additional comments with my own observations based on the field notes and on my

theoretical understanding. In this way I, as researcher, was constructing meaning from a variety of sources, but I kept in mind that "qualitative research leads to as many interpretations as there are researchers" (Kvale, p. 279). It is standard practice to meet with participants to let them approve interview transcripts, but I felt it was even more important that they review my interpretations of the transcripts, which would, after all, be the view of their experiences that actually appeared in the final thesis. According to Lincoln and Guba (1985), this sort of "member checking" plays a critical part in maintaining the trustworthiness of qualitative or naturalistic research, for several reasons. It ensures that the interpretation accords with what the participant *intended* by his words, it allows factual errors to be corrected, and it provides an opportunity for the participant to add further thoughts and comments (p. 314).

Conclusion

In the end, then, I was asking a great deal more of my participants than merely their informed consent. I was requiring "active assistance…, including a level of research cooperation that frequently amounts to colleagueship" (Wax, 1982, quoted in Howe & Moses, 1999, p. 41). This raised the ethical question about parity: Were the participants' potential gains from the study in line with its demands on their time and intelligence? I trust that if participation was truly voluntary, they might have been. Participants might well have appreciated an opportunity to express their feelings about their difficulties and successes both in Seneca College English courses and in language learning in general. They might have found the audiotaping, think-aloud and transcribing process intellectually intriguing. They might also have found that telling their story and seeing it written out in a coherent way helped them to look at their difficulties in context and provided greater self-understanding.

(This is the reaction I received from interview participants following an earlier paper I wrote for EDUC 5P92.) These potential benefits should provide some "reciprocity" for my participants' vital contribution to this study.

CHAPTER FIVE: DATA COLLECTION

The Interview Process

The interviews were set up largely in the way anticipated in the previous chapter. As soon as Brock University's Ethics Review process was complete and Seneca College's Research Committee approved, I sent the recruiting email (see Appendix C) to approximately 180 students in 6 former classes, eliminating only a few students who I knew to be in my class again for the current term. I received 10 responses indicating interest in the study and over the next few weeks corresponded with those students explaining the scope of the study in more detail and suggesting a range of times for possible interviews. In the end, I had to eliminate 2 of those interested because they subsequently joined my current class, another because of time-table conflict, 1 more because the study would not help him with his practical English skills, as he had hoped, and a final student because she did not respond to my email suggesting meeting times. However, over an 8 week period, I was able to meet with 5 students, 3 men and 2 women, for main interviews and think-aloud sessions, which were tape recorded, and follow-up sessions to review the "summaries" of their interviews, which were more informal. The participants, all young adults in their 20s and 30s, came from a variety of language backgrounds: Arabic, Romanian, Chinese, and Persian. One, a South African, is a native speaker of English.

The basic process for the interviews was as follows. We met in a "seminar room" in the Learning Commons at Seneca@York. The rooms were small, but provided glass-fronted doors so that we could have the privacy of a closed door without a threat of unwelcome intimacy. After I greeted the participant and thanked him or her for coming, we reviewed the Information Letter and Informed Consent form, signing the latter. I also asked the participant

to provide some "contact" information, including his or her course of study, semester level, and telephone number if he or she was willing, and invited him or her to provide a "pseudonym" to be used when the interview was written up. I then started the tape and encouraged the participant to tell about his or her background, with emphasis on education and language learning in general and English language learning in particular. I used the list of "Backgrounding Questions" (Appendix E) for prompting but did not follow it in detail while the participants narrated their general background. However, I found I had to refer to the questions more strictly in order to learn in more depth about the participants' feelings and experiences in English language classes.

I left the tape player on while I introduced the think-aloud process through the practice sentence combining exercise, a short and simple one. At this point I explained about the nature of "inner speech" and the need to reveal it whatever its language. I also showed participants the "Keep Talking" sign and indicated that it was a less intrusive way to remind them if, as was easy to do, they forgot to speak for a space of time. After the participants had completed the practice exercise, I asked them to discuss their experience combining sentences as they spoke their thoughts. We usually moved quickly on to the main exercise then, while I tried to maintain the casual and friendly atmosphere of the less structured part of the interview.

Once the participants began this main part of the exercise, with more challenging sentence combining problems, the discussion centred on the problems themselves and not on the think-aloud component of the process. As the participants worked on the problem, I had a widely spaced copy of the same sentence groups in front of me and took point form notes on the strategies they used and any comments or actions that seemed to me to reveal their

thought processes. In general, I found that the participants revealed their thoughts to a similar extent, and all required some prompting to keep talking at times. After the exercises were completed, I invited the participants to discuss their feelings again about the exercises. For example, I asked whether they had found the first part (the expository writing in separate sentence groups) or the second part (the narrative paragraph) more challenging.

Although I reminded all participants at several times during the process that they were to voice any thoughts in their first language, none of them did except for a few isolated words. This was a somewhat unexpected result and will be discussed in a later chapter. Several participants revealed more about their first language thoughts during the discussion at the end of the exercise, which proved that an immediate postinterview discussion provided valuable "triangulation" for the study. Some participants used a few basic metalinguistic terms such as "verb" and "subject" during the "think-aloud." At the end, I asked all participants if any other terms like these had occurred in their inner speech, but in general even those who claimed to think of grammar rules when writing essays did not think in grammar rules while combining sentences. This also will be discussed in a later chapter.

After the initial interview and think-aloud session, I transcribed the interviews, taking care to indicate not only their words, but also their pauses, tone of voice, and significant gestures where I had been able to note them. I also kept an "Interview Journal" with my own observations on the participants, the interview and think-aloud experience, and the transcription process. Later, I summarized my transcript, paraphrasing most of the information but occasionally quoting passages of think-aloud that showed a participant attempting to solve a particular language-based problem. This summary is what I showed to the participant in the follow-up interview, asking him or her to make any changes, additions,

or corrections desired. In general, the only changes made were very minor. During the follow-up interview, I also asked a few additional questions about the participants' reading and writing strategies and learning style in general (see Appendix E). I invited the participants to complete a brief questionnaire identifying preferences of visual, auditory, and kinesthetic learners (from Beatrice, 1993; see Appendix F). When I had self-tested the sentence combining exercises, I had noticed that I, a heavily visual learner, was manipulating the word groups visually, so that the printed words actually seemed to move on the page in front of me. I wondered if any of the participants experienced a similar visual process, even though the think-aloud proved that they also "heard" the words in their mind as they attempted to combine them. I added the results from the follow-up interviews into the original interview summaries to create a comprehensive "thick" description of the participants' experiences. These, together with relevant passages from my "Interviewer Journal" make up the remaining sections of this chapter.

The First Interview: "Ben"

Background

Ben has a very cosmopolitan background. He was born in Iraq to Moroccan parents; his father is a Jew and his mother Muslim. Since he lived in Iraq until he was 7, Arabic, also his mother's language, was his first language. After returning to Morocco when he was 8, Ben also had to learn French, the official language for public use there. About this time, his father left the family and Ben has lost touch with him. Ben became less committed to his schooling after that, and when he was 17, left school and moved to Spain where he worked for 2 years and learned to speak Spanish, though this was "from the street" and not in a school setting. He later moved briefly to Florence in Italy before applying to come to Canada. He did not

seriously consider moving to a French-speaking part of Canada, perhaps because he felt less comfortable with the French he learned at a fairly late age in Morocco and which he considers to be "not very professional." Instead, he moved to Vancouver, where he first began ESL classes with the LINC program at the age of 23, about 5 years ago. Ben worked hard at learning English, immersing himself in it for 9 hours a day, including classes and home study. He also polished his conversational English in communication with English-speaking girlfriends. Ben's current interest, which brought him to Seneca College in Toronto, is in working with computers, a field that also encourages him to use English much of the time, although in more personal circumstances he still "thinks" in his mother tongue, Arabic. He agrees that his spoken English is stronger than his writing.

Ben believes he learns languages fairly easily, and while he found the Romance languages of French and Spanish quicker to learn to speak, he believes English has the easiest grammar. He is interested in vocabulary and the meanings of words and also notices pronunciation, such as the difference between the vowel sound in "look" and "boot." Ben chose his first "Oxford" dictionary because it showed how to pronounce words. He says that while the French and Spanish speak "from the throat," the English speak "from the mouth." He admires the way the Irish and Scots people speak English (it's "just so smooth"), and, coincidentally, Ben himself speaks English with a bit of an Irish lilt. Although Ben pays close attention to the meaning of words, he is sometimes frustrated by his limited vocabulary in English. "Sometimes when I write I stop because I don't have enough words to write. I know it in French and I know it in Arabic, but I don't know it in English, so it's difficult. So I try to find an alternative that means the same thing." When reading, he will try to interpret unfamiliar words by examining their context, and he also works with word families, root

words, prefixes and suffixes, to help him understand vocabulary. As an example, he cites the word "create" which can become "creator", "creative," and "creature". This is a vocabulary-building skill he believes should be taught more explicitly in ESL classes, as he had to work it out for himself. Since he did, however, he has found it much easier to expand his vocabulary. As he put it, "It's way easier. It's families. And the really weird thing is that I found out these words myself. There was no teacher came up to me and said… watch out for this. From this word you can make other words."

Ben has many interests. He reads the *Globe and Mail*, occasionally, but claims to have read the English Bible four times (his religious interests are as eclectic as his language background). He also has tried writing poetry in his strongest language, Arabic. He loves Arabic and reads the Koran for the sound of the language more than for religious reasons.

Ben found the little sentence combining he did in EAC 149 to be interesting, but as his English improves he finds more satisfaction from writing essays and using words he chooses himself to create a more "logical flow of my sentence."

Sentence Combining

- It often becomes humid.
- It becomes humid in Toronto.
- It becomes humid in the summer.
- The humidity is extreme.

Ben began the practice sentence group confidently, seeing that he needed to group ideas together with different punctuation from the periods ("add commas and all that"). He read over all the sentences quickly, stressing different key words as he tested the meaning (*It often becomes* humid *in Toronto. It* often *becomes humid*….) He noted that the last kernel sentence (*The humidity is extreme*.) was the main point of the sentence group, one of two

major parts. He decided not to add any joining words because the information given "has all the elements to give it a complete meaning…so we have weather and we have adjective and we have place." Here is the result of his combination:

Completed Sentence: *The humidity is extreme, it often becomes humid in the summer in Toronto.*

While solving this word problem, Ben spoke only in English. As soon as he was finished, he confirmed that: "To this comma here…to the last word I said, it was all English. There was no Arabic in my mind, totally not." He thought if he were working by himself instead of with an English speaking teacher, he "*probably*" would have thought more in Arabic.

- Many Canadians have become health conscious.
- Their consciousness has increased.
- This is thanks to scientific studies.
- The studies were well publicized.
- Many Canadians still die each year.
- They die from heart attacks.
- They die from strokes.

When he began the main set of sentence groups, Ben first read the instructions and asked what "whole discourse" meant. He read through the sentences fairly rapidly, but slowed down when he came to the less familiar word "*publicized.*" After examining the word more closely, he pronounced it correctly. He did not seem to have any trouble grasping the meaning of the kernel sentences, which he felt revolved around the phrase "*many have become health conscious,*" and quickly decided on a method of combining them, using a semicolon. As he began to write down the words, he read them slowly, asking if his pronunciations of "*conscious*" and "*saturated*" were correct. He noticed that the first two kernel sentences used the perfect tense, which he likes because it gives a more precise idea of an action taking place over a length of time. He offered other digressions: comments on pronunciation of past tense forms–"It looks like –ed but it sounds like a "t"–and the difference between "*good*" and

"*well.*" Ben was concerned that the sentence seemed too long and his first attempt created two sentences for the first group, but when reminded of the rules he was quickly able to change the period to a semicolon before "*however.*" After he had written out his combined sentence, he proofread it and added in a missing word, "*still,*" but made no other changes.

Completed Sentence:	*Many Canadians have become health conscious, their consciousness has increased; thanks to scientific studies, <u>because</u>* [his underlining] *the studies were well publicized; However, many Canadians* [added in with arrow] *<u>still</u> die each year from heart attacks and strokes.*

- Saturated fats are the main culprit.
- Fast foods are a big source of such fats.
- These include hamburgers.
- These include French fries.
- These include milkshakes.
- A fast food hamburger has over 30 grams of fat.
- The fries have 11 grams of fat.
- The shake has 9 grams of fat.

As Ben started the second sentence group, he experimented again with the pronunciation of the word "*saturated,*" but when asked admitted he did not know its meaning. After that, when he asked for confirmation of his phonetic pronunciation of the word "*culprit,*" he also asked for its definition. He was interested in the content of the sentences ("I didn't know that…oh my god!") and quickly decided to omit the repeated "*include"* and "have listing, listing with a colon." Again, as he wrote out the words he talked about the metalinguistic thoughts that occurred to him. "So we put the 'a'; that means it's single, so…plural," and "when it comes to the word 'the'… I usually want to say 'thee'." As he read his sentence over, he decided to remove one of the phrases "*of fat*," letting the phrase at the end stand for all three items in the list: "*Hamburgers have over 30 grams, fries have 11 grams* and *the shake has 9 grams of fat*. So this '*of fat*' comes back on these two ones, so the reader can…It's kind of obvious."

Completed Sentence: *Saturated fats are the main culprit, fast foods are a big source of such fats, there includes hamburgers, French fries and milkshakes, besides fast food hamburger has over 30 grams of fat [crossed out], the fries have 11 grams and the shake as 9 grams of fat.*

- The total does not make for ideal nutrition.
- The total is over 50 grams of fat.
- This is in a single meal.
- One expert recommends 10 to 20 grams of fat.
- The expert is Dr. Glen Griffin.
- This is a daily average.
- The daily average is healthy.
- We still get 42 percent of our calories from fat.
- This is four times the body's requirements.

As he read the first two sentences of the final sentence group, Ben checked the math with the previous sentence, but he was puzzled by the relationship between the 50 grams of fat in the second kernel sentence and the 10 to 20 grams in the fourth sentence. Which one was the daily average? The next sentence, "*The daily average was healthy,*" seemed to explain it. He had no trouble deciding to identify Dr. Glen Griffin in a noun phrase ("*who is the expert*") and noted the difference between "*the expert*" and "*an expert,*" changing to the latter. He was not sure what to do with the last kernel sentence: "You know, I don't think we need the last sentence. No, we do need it, but …how do we have to join it?" After some considering, which included a digression on the benefits of television to second language learners, he decided to join it with "*because*."

Completed Sentence: *The total does not make for ideal nutrition, because it is about 50 grams of fat in a single meal, Dr. Glen, who is an expert, recommends 10 to 20 grams of fat, this is the daily average and it is healthy; However, we still need 42 percent of our calories from fat, because it is four times the body's requirements.*

Ben was concerned by the final, paragraph consolidation, exercise because he had not done anything like it before in the EAC 149 class. He asked, "So you want me to make a paragraph that's already existing. How long is the paragraph? Does it matter?"

Richard Wagner had the emotional stability of a six-year-old. He felt out of sorts. He would rave. He would stamp. He would sink into a gloom. The gloom was suicidal. He would talk. His talking was dark. His talking was of going to the East. It was to end his days as a Buddhist monk. It was ten minutes later. Something pleased him. He would jump up and down on the sofa. He would stand on his head.

As he read through the kernel sentences, he stumbled over the word "*suicidal,*" but when it was pronounced for him he immediately saw its connection to the word "suicide" and that the "*al*" ending made it an adjective. He was also surprised by the word "*Buddhist,*" which he could not easily pronounce but recognized as a Chinese religion. He also asked for the meaning of "*monk.*" After reading the passage through, he looked at the reference and declared it to be "a very nice and smooth way of writing." He looked over the passage again, noting the words he had had difficulty with and wondering about the token word "*something*" in the third sentence from the end. After a brief discussion of the English and German pronunciations of "*Richard Wagner*" and of abbreviations of names ("Dick" for "Richard"; "Ben" for "Benjamin") he began to write down his sentences. When reminded that he could first mark up the question paper, he was pleased: "Oh nice, and then I write it?" and began to read it again. He had some trouble with the idiom "*out of sorts*" and "*rave,*" which he now realized was not the same as a present-day dance party. He spent some time working out a way to combine the first few kernel sentences into a list of verb phrases. Here is a passage from the transcript, showing his spoken thoughts:

> Cancel these ones [the repeated words like "he"]. Comma. *He would sink into*...no, no, no,...it won't be this way, nope...I'm going to go, *he felt out of sorts...he felt out of sorts..., no he felt out of sorts...comma... and would rave...stamp...sink...and gloom...no, sink into gloom*...that's kind of confusing

> here. I'll try to make it work. Let me see, if I say "*into gloom*" after *stamp...he would stamp* by itself...*he would sink*...hmmmm *into a gloom*...okay, *he would rave, he would stamp...he would sink into gloom*...no there's something more. That's a noun, that's a noun. I need a verb. I need a verb...where do I get a verb from? See, that's the only problem...
>
> Interviewer – Umhmm. I don't know if there is a verb from that. There's the adjective "gloomy."
>
> Ben – Gloomy. Okay. *He would rave. He would rave. He would be gloomy.* Okay. *He would rave, he would stamp, no he would rave, stamp and...yeah...he would rave, stamp and* ...cancel *he...and would sink into a gloom*...that makes sense...comma...no, no comma...uhhh...semicolon....no ummm should be just a comma...*the gloom was suicidal.* And then period. You see that's two sentences. *He would talk...His talk...his talking was dark. His talking was of going to the east.* Okay, we need changes here, serious changes. *He would talk and his talking was dark...his talking was dark...was going...was going...to the East...his talking...dark...no...his talking was dark...and his talking was dark,* okay. *He would talk.* Cancel the "*he*"...put *and. And his talking was dark. His talking* ...comma...no...uhh...semicolon...nope...*his talking....was going to the east.* Then we have a period so that's another sentence. *It was to end his days as a Buddhist,* so that's explaining the other thing that I don't...why is he going east to end as a Buddhist....*it was to end his days as a Buddhist monk.*

In the end, we decided to let him make four sentences. When joining the last four kernel sentences, Ben recognized that there were too many "*ands*" for good style, but was not sure how to solve the problem "because it seems too hard at this point. These [the first three sentence groups] were way easier than those ones." As he was writing out his sentences he had some trouble joining the ideas of the fifth and sixth kernel sentences ("*He would sink into a gloom. the gloom was suicidal*.") Here are some of his spoken thoughts, with my interjections. I felt it was appropriate to use metalinguistic terms like "adjective" and "noun" since Ben had already used these terms in his own spoken thoughts earlier in the session.

> So...okay...*he would sink into a* ...okay...I got it...ha, ha! ...*suicidal gloomy...gloomy suicidal*?
> Interviewer – Whatever sounds right to you.
> Ben – Okay. *He would sink into a gloomy suicidal*...no.
> I – Suicidal's an adjective.

B – So it comes first, right.
I – So it would be next to a noun.
B – Yea. Oh, okay. I can cancel some words. So we take the adjective suicidal to its origin – suicide. *Gloomy suicide*. And then period. *He would talk...He's talking...he would talk dark...he would talk...dark talking?* No....This doesn't make sense. *He would talk darkly talking*?
I – Umhmm.
B – I don't know. You can make the adjective an adverb? Add an "ly"? Okay. *He would darkly talking...and his talking...because his talking was...yes, yes...his talking was of going...was of going...to the East.*

After he had put together his sentences and was reading them through, Ben talked about the different pronunciations of the word "later" by English speakers with different accents, and decided that "you can't have two '*because*' in one sentence." Here is the completed paragraph.

Completed Paragraph:	*Richard Wagner had the emotional stability of six years old, he felt out of sorts, he would rave, stamp and sink into a gloomy suisid* [sic] . *He would darkly talking, because talking was of going to the East, it was to end his days as a Budhis* [sic] *monk. Ten minutes later something pleased him, he would jump up and down on the sofa and stand on his head.*

Once the exercise was done, we discussed the reasons Ben had found the fourth part so much harder to do than the earlier three sentence groups. He said he had found the organization of ideas in the earlier sentence groups more logical, so that it had been easier for him to identify the main points. He also thought it might have been easier to do the sentences without my presence, since he would have felt more free to do his thinking in Arabic. He recognized that you can't force English to become your "default language" or language of thought.

We decided to replay the last part of the think-aloud since it was the one which had involved the most talking and thinking. Ben agreed that he was comfortable using terms like "adjective" and "verb," and admitted that he was still puzzled by the concepts "gloomy" and

"suicidal" and their role in the sentences. Probably his difficulty in joining the sentences in the Richard Wagner paragraph was partly due to his greater difficulty in understanding its meaning. The earlier passages on food and health had contained fewer unfamiliar words, and those he had been easily able to work out from root words and from context.

Interviewer Journal

Because the initial interview and exercises had taken so long, and since he had not spoken in any language other than English, I did not feel it was necessary to replay the whole tape, but instead concentrated on the final paragraph. When I did that, I selected a couple of remarks that had been unclear and asked about them specifically; for most of the time which was reading and rereading and puzzling over the words, I asked general questions of what he had been trying to do. His answer, "looking for solutions," was not really exact, but it was probably as exact as we could get after the thoughts had long passed from STM.

Some interesting points came up while discussing the play-back. I noted them down briefly, but of course I could not tape them. … If I had been less rushed when replaying the tape… and if we had not been distracted, talking at length about other aspects of the experience…perhaps I should have asked what exactly he was thinking at this point. But I am not sure he could have explained it in words, even right after the interview. I suspect that the processes in his mind were not all verbal.

Although it helped that I transcribed the interview the very next day while many of the ideas we talked about were fresh in my mind, this did not help him achieve word for word accuracy. The first part of the interview, which was Ben's background, did not need to be word for word. This is good, because many words were hard to hear. The quality of the tape was not great, and there was more background noise than I expected. Also, many words were

mumbled or swallowed. At least his accent was not difficult to understand. … I also made some conscious "editing" choices. When some filler sounds (such as uh…you know…okay…no, no…) were repeated many times, I wrote them down only a token once to represent the break in continuity. I also omitted most of my supportive or encouraging noises (umhmm, yes, go on) that I put in whenever he seemed uncertain or hesitant. So I cannot pretend that this is a scientifically precise transcription of our conversation. However, it is a close enough approximation to see the pattern of his "inner speech," I believe.

Follow-Up Interview

Ben's self-analysis shows him to be balanced between visual and auditory preferences in learning style. However, when combining sentences he relied most heavily on the auditory side: As he worked on the problems, the sentences were "evolving in sound, not image." Also related to this Auditory emphasis was his concern about pronunciation. Ben cares a lot about pronunciation, and when he reads a word he cannot pronounce, he usually consults the Webster's Online Pronunciation Guide or an Internet "Talk" program that will play a voice pronouncing the word. He is very metalinguistically aware, and this faculty is growing constantly. For example, in his EAC 150 class Ben recently learned about prepositional phrases that act as adverbs, and he now notices this type of phrase when he is reading. He believes he is not consciously concerned by style when writing (although at one point in the think-aloud he worried about using "*and*" or "*because*" too often) but is sometimes frustrated by his small vocabulary which limits the variety of words he can use. He does not proofread his essays, either. If he has time left before he has to hand in an exam or other written paper, he will try to add words to strengthen the meaning but does not worry about correcting grammatical errors. In general, he finds mastering English sentence structure more difficult

than acquiring vocabulary, especially when he is writing. When he is reading he is aiming for a general understanding and may not worry about the precise meaning of any subordinate thoughts.

The Second Interview: "Eliza"

Background

Eliza is a young Romanian woman who has been living in Canada for only a year and a half. She learned some English in school in Romania, starting about grade 4, but since that teaching had concentrated on grammar, she felt she had arrived in Canada with no ability in spoken English. Starting in grade 7, she also studied French, which, like Romanian, is a Romance or Latinate language. In fact, she finds these languages so similar that she has picked up Spanish easily from television programs. However, she still claims to find English easier than French, perhaps because she started learning it at a younger age. Eliza's family is well educated, and as a high school student she enjoyed reading European literature and philosophy. Since her family came to Canada they have made a conscious effort to immerse themselves in the English language. They live in a neighbourhood where their neighbours are all English-speaking Canadians, and they make a point of speaking English, even in the home, "because it is better practice. If you speak your own language, you don't learn."

Although Eliza has not always found English grammar easy, she has studied it for so many years that she feels she has benefited from it. She finds reading the easiest task in English. She occasionally finds unfamiliar words and has to look them up in a dictionary, but she is not troubled by English syntax, which in some ways is similar to that of Romanian. Her acquisition of English has recently passed an important milestone. Up until 4 months ago, Eliza thought in Romanian and translated her thoughts, even when speaking and writing in

English. Now she thinks in English when she is communicating in English. She only became aware of this change when her parents pointed out that she seemed to take longer to compose her sentences.

As an EAC 150 student in the winter of 2002, Eliza did not really enjoy writing essays, although she has experimented with writing poetry in her own language. Since many Romanian words cannot translate exactly in English, she feels she would have to think in English more comfortably and expand her vocabulary before she could write poems in English. However, she still prefers writing to speaking; she had no experience speaking in public before coming to Canada, and oral presentations left her shaking. She knows she has learned a lot of English grammar over the years, but regrets that the books had required her to translate from Romanian into English, "...probably this was one of my mistakes, because is not good to translate from Romanian in English, 'cause you think in Romanian, and this was one of the reasons ...I couldn't think in English." When she first began speaking English, she worried about her grammatical correctness and tried to think of the rules she had learned, but "right now I don't think when I speak. I'm not thinking any more of grammar." However, she still thinks about grammar while she is writing. She saw the benefits of sentence combining exercises because she realizes sentence variety makes one's writing more interesting to read and, in EAC 150, preferred them to traditional grammar. However, an open-ended writing assignment on a topic of interest would be the most agreeable English assignment to her.

Sentence Combining

- It often becomes humid.
- It becomes humid in Toronto.
- It becomes humid in the summer.
- The humidity is extreme.

As I explained the technique of "thinking aloud," asking her to speak whatever words were in her mind, including Romanian words and grammatical terms, Eliza pointed out that she would be reading first of all. As she read the short sentence group above, she noticed the repeating words "*humid*" and "*becomes*" and decided to eliminate most of them. I suggested that she could use her pen and cross them out, but she continued to attempt to solve the problem mentally. She later suggested this was the best way to "find the logic" before combining the sentences. She decided the word "*during*" was an improvement on "*in.*" Once she started writing down her sentence, she found it easier to see what she was doing: "I can concentrate much better when I am writing something, because also when I'm studying I used to take notes."

Completed Sentence: *It often becomes humid in Toronto where during the summer the humidity is extreme.*

- Many Canadians have become health conscious.
- Their consciousness has increased.
- This is thanks to scientific studies.
- The studies were well publicized.
- Many Canadians still die each year.
- They die from heart attacks.
- They die from strokes.

Eliza saw immediately that the first three sentence groups were on a related topic. She began reading, hesitating over the pronunciation of the words "*conscious*" and "*consciousness.*" After reading all the kernel sentences through, she decided to join the first two with "*because*." At that point a Romanian word also showing a cause and effect relationship–datorită–came into her mind. It would have fit the scientific nature of the writing better than "*because*" by itself she thought (it means "because of"). She decided to add a semicolon after "*well-publicized*" and seemingly automatically joined the last three kernel

sentences as a list. Eliza had completed this sentence group quickly and seemed to have little trouble with it.

Completed Sentence:	*Many Canadians have become health conscious which has increased because of* [datoritã]*.the scientific studies which were well publicized; many Canadians still die each year from heart attacks and strokes.*

- Saturated fats are the main culprit.
- Fast foods are a big source of such fats.
- These include hamburgers.
- These include French fries.
- These include milkshakes.
- A fast food hamburger has over 30 grams of fat.
- The fries have 11 grams of fat.
- The shake has 9 grams of fat.

Eliza moved rapidly on to the next sentence group. (She later admitted that because of the tape player she had felt pressured to work quickly.) After reading through the sentence groups, she experimented mentally with several joining strategies, putting "*for example*" between "*culprit*" and "*fast foods*" and a semicolon followed by "*for example*" after "*milkshakes*." As she wrote the sentence down, she made some changes, substituting "*such as*" for the first "*for example*" and adding "*which*" after "*fast foods*." Again, she made the last three sentences into a list without any hesitation or experimentation on her part.

Completed Sentence:	*Saturated fats are the main culprit such as fast foods which are a big source of such fats like hamburgers, French fries, milkshakes, for example a fast food hamburger has over 30 g of fat, the fries have 11 g of fat and the shake has 9 g of fat..*

- The total does not make for ideal nutrition.
- The total is over 50 grams of fat.
- This is in a single meal.
- One expert recommends 10 to 20 grams of fat.
- The expert is Dr. Glen Griffin.
- This is a daily average.
- The daily average is healthy.
- We still get 42 percent of our calories from fat.
- This is four times the body's requirements.

As Eliza read through the kernel sentences, she was already shaping them as a single sentence in her intonation. As she read the earlier sentences, her voice rose as it does when one reads a clause within a sentence, but with the last sentence her voice fell, a sign of completion. This time she began writing down immediately, without trying to solve the problem mentally first because, as she told me later, the "logic" seemed quite clear. She embedded the idea from the second kernel sentence into the first using "*which*" to create a relative clause. She also used "*which*" to join the next kernel sentence "*which is a single meal*" and a passive participle "*recommended*" to introduce the concept of the expert. His name, "*Dr. Glen Griffin*," was embedded as an appositive. She used "*which*" again, instead of the more appropriate "*who*," to link the next concept, and a relative clause with "*that*" to join the concept of "*healthy*" to "*daily average.*" Finally, Eliza stressed the contrast word "*but*" to attach the last two kernel sentences, the second again being an appositive, or what Mellon (1969) calls a "free modifier." In all, Eliza used a very wide range of sentence combining strategies here, most of them idiomatically.

Completed Sentence:	*The total does not make for ideal nutrition, because it is about 50 grams of fat in a single meal, Dr. Glen, who is an expert, recommends 10 to 20 grams of fat, this is the daily average and it is healthy; However, we still need 42 percent of our calories from fat, because it is four times the body's requirements.*

Richard Wagner had the emotional stability of a six-year-old. He felt out of sorts. He would rave. He would stamp. He would sink into a gloom. The gloom was suicidal. He would talk. His talking was dark. His talking was of going to the East. It was to end his days as a Buddhist monk. It was ten minutes later. Something pleased him. He would jump up and down on the sofa. He would stand on his head.

As Eliza began reading through the paragraph, she seemed to understand the first few sentences without difficulty. She did pronounce "*six-year-old*" as if it were three separate words. She had trouble with the pronunciation of "*suicidal*" and seemed, by her questioning

intonation, to be puzzled by the phrase "*going to the East*," although she knew that Richard Wagner was a German composer. As she began to write her sentences, she debated what transition she should use between the first and second kernels, deciding on "*as a fact*" separated by commas. The next two kernels were added in a verb list, then the next connected with a relative clause: "*a gloom which was suicidal.*" This last took a bit of a pause to work out. She took more time, trying and rejecting a number of word combinations, as she decided how to work in the odd concept of "*dark talking*":

> *Richard Wagner had the emotional stability of a six-year-old...as a fact, he felt out of sorts, he would rave, he would stamp, he would sink into a gloom...a gloom...* and I think after *gloom* comma*...and a gloom which was su-i-see-dal...*dot [period]. *Then he would talk...uh...then he would talk...uh...then...he's talking...his dark talking...his talking was going to the East...um...then...his ...dark...talking...about going to the East....about....going...to the East...about going to the East...it was to end his days as a Buddhist...Buddhist monk...it was ten minutes later...that his dark talking about going to the East...going to the East where it was the end of his days as a Buddhist monk* [questioning intonation]*...it was ten...and his dark talking about going to the East where...where...it was...the end... of... his... days... as... a... Buddhist...monk...was...ten minutes later*, okay, let's see*...Then his dark talking about going to the East where it was the end of his days as a Buddhist monk was ten minutes later,* yeah*....ten...minutes...later.*

Even though she seemed to be having trouble with some of the unfamiliar idioms, Eliza was sure she could condense the paragraph into only three sentences. As she worked out the strategy for the last three kernel sentences, she first proposed using "*but*" to introduce the contrast in mood, and shortly afterward added in "*when*" to actually link the final ideas. She wondered about including the word "*suddenly*" after this, but decided not to.

Completed Paragraph:	*Richard Wagner had the emotional stability of a six year old, as a fact he felt out of sorts, he would rave, he would stamp, he would sink into a gloom,* [next two words inserted with an arrow*]a gloom which was suicidal. Then his dark talking about going to the East where it was the end of his days as a Buddhist monk it was ten minutes later. But when something pleased him he would jump up and down on the sofa and stand on his head.*

After Eliza read this paragraph over she claimed to be dissatisfied but was not sure why. I asked her if she had had any trouble understanding the meaning, and she admitted she had had trouble with "*rave*" and "*sink into a gloom.*" Looking further up the sheet, she also identified "*culprit*" as a problem word; when I explained the meaning, she immediately recognized a similar Romanian word–culpabil–which must come from the same Latin root, like the English word "culpable". Apart from these few expressions, Eliza did not feel she had any serious problem with comprehension.

After the tape recorded was turned off, we discussed the experience. Eliza revealed that she had, indeed, generally thought in English apart from a few, isolated words. She had found it easier to solve the problems when she could look at what she was doing (writing it down), as she also remembered her notes better when she highlighted them. Eliza was most frustrated by her limited English vocabulary and what she called her lack of "elevated" words.

Interviewer Journal

Eliza's interview went much faster than Ben's, partly because she was less discursive. She also spoke more quickly, especially during the taping of the sentences. She admitted later that the presence of the tape recorder made her feel pressured to work quickly.

The sound was much clearer, for a variety of reasons, so I did not have so much trouble interpreting the words I was hearing. However, Eliza and I often interrupted each other and finished each other's sentences when we were talking. This was hard to indicate in a transcript where the speakers are artificially seen to always take turns.

Follow-Up Interview

Eliza believes she is a visual learner, and this is supported by the results of the questionnaire. However, when she was solving the sentence combining problems, although

she found it helpful to see the words on the page as she wrote, she was listening to them in her mind and not manipulating them visually. She thinks she might be able to do such visual manipulation with word puzzles in her own language. As a visual learner, she is more concerned with meaning than with pronunciation and will not try to work out the pronunciation of an unfamiliar word as long as she can understand its meaning. When she is writing she thinks about the rules of grammar "every time"–including verb tense, spelling, and sentence combining strategies. She claims to think about style less often, although she likes long, sophisticated sentences because they are more interesting and contain more meaning. If she has time to edit a paper she has written, she will "review" it by skimming through looking for errors in verb tense and spelling, doing this word by word if she has time. She finds writing in complex English sentence structures difficult, but reads them comfortably. Vocabulary is also more of a problem when writing, because when she is reading she can work out the meaning of words from their context.

The Third Interview: "Mike"

Background

Mike was born and raised in South Africa, coming to Canada around the age of 15, and his native language and that of his parents is English. He also speaks Afrikaans, though he does not know it as thoroughly. He grew up in a "mixed" neighbourhood that included people from a number of ethnic backgrounds, but most spoke "standard" English. When he studied Afrikaans as a school subject, beginning about age 12, he found the grammar difficult, as it is very different from English. However, since he had friends who spoke only Afrikaans and had many opportunities to use the language outside the classroom, he feels he can read and speak it fluently. He would not be as confident, however, if he were asked to write essays

or other formal writing assignments in Afrikaans because he lacks some of "the really big words." Mike speaks English with the traces of an Afrikaans accent, and he expects there may also be Indian overtones in his accent, since his family migrated to South Africa from India many generations ago, but he does not know any Indian languages.

Mike enjoyed most aspects of his English classes in school, particularly class discussions. In this sense, Canadian schools were more stimulating because students were able to offer their own opinions instead of memorizing what the teacher told them. He rates his English vocabulary as "very good" and growing, since in the last year or so he has begun to do more reading for pleasure and, if necessary, looks up unfamiliar words in the dictionary. He feels he is stronger at oral communication than at writing, but now that he understands the structure of an essay better he is doing well at writing too. He considers grammar to be sometimes difficult, but necessary. He learned grammar in elementary school, beginning with basic phonics in grade 1. Terms like noun and verb were taught in grade 4. Today he is not consciously aware of grammar when he is writing; he is concerned only about making his meaning clear. He found sentence combining exercises interesting because they "gave you practice in how to use certain words and use them effectively." For this reason they are "much more effective" than traditional grammar exercises, although open-ended writing assignments like essays are best since "you can express yourself more. When you start following rules, you start restricting yourself and how you want to say things."

Sentence Combining

- It often becomes humid.
- It becomes humid in Toronto.
- It becomes humid in the summer.
- The humidity is extreme.

When Mike read over the sentence group for the practice exercise, he immediately wanted to impose his own style on it, asking "should I use all the words or should I change them?" He decided that to use both "*humid*" and "*humidity*" in the same sentence was redundant, and he wanted to change "*summer*" to "*summers*" to indicate that this was a regular occurrence. I pointed out that "*in the summer*" suggested most summers, not a specific one, and he left the word singular. He reported that it was a little difficult trying to concentrate on the sentence while reminding himself to keep speaking aloud.

Completed Sentence: *The humidity in Toronto summer is extreme.*

- Many Canadians have become health conscious.
- Their consciousness has increased.
- This is thanks to scientific studies.
- The studies were well publicized.
- Many Canadians still die each year.
- They die from heart attacks.
- They die from strokes.

Mike wanted to know if he was to join all three of the Whole Discourse groups together. I pointed out that they were related in content, but that he should create three sentences when finished. After he read the kernel sentences through quickly, Mike began experimenting to see which one would become central to his new sentence. He first tried the third and fourth kernel sentences, "*The study...the publicized...publicized scientific studies have shown…*;" then he tried to start with "*Many Canadians... Canadians...have become...more…*" and then switched to the last three kernels, "*Many Canadians... still die... each year...from...heart attacks...and strokes...even though...scientific studies...have shown....*" He decided the last way sounded "good." He explained that he had first thought that the studies had been the cause of the increase, which he indicated with the word "*more*." He justified this change, arguing that "people like to make things simpler."

Completed Sentence: *Many Canadians become [crossed out] still die each year from heart attacks and strokes eventhough scientific studies [added with arrow] have shown an increase in health consciousness.*

- Saturated fats are the main culprit.
- Fast foods are a big source of such fats.
- These include hamburgers.
- These include French fries.
- These include milkshakes.
- A fast food hamburger has over 30 grams of fat.
- The fries have 11 grams of fat.
- The shake has 9 grams of fat.

As soon as Mike had read this sentence group through, he asked if he were allowed to add words. He then began to work with the third to fifth kernel sentences, beginning a list with "*such as*" and linking to the last three kernels with a participle phrase "*each having*," and ending the list with the organizing word "*respectively*." After that, he returned to the first two kernel sentences, experimenting with ways to combine them ("*main culprits such as fats are the main culprits of...source...the foods...the fat are culprits...*"), but looking puzzled. I explained that the word "culprit" referred to the ideas of the previous sentence, which were connected logically but not grammatically to this one. Mike read over the parts he had already combined, and added "*are the main source of saturated fats*" to the end, and asked if that made sense. I pointed out that he had left out the "*culprit*" idea, and he confessed to being confused about how to use it since he could not join this sentence group to the previous sentence. I said they were "related in the same way sentences in a paragraph were related to one another" and he agreed to add "*The main culprits are*" to the beginning of his sentence. He also felt that he could leave out "*the main source of saturated fats*" because the idea was already included with the phrase "*big source of such fats*." Mike's last decision was to add the modifier "*saturated*" to the noun "*fat*" because "I state over here that it's saturated fats…I can

take out… like I'm saying it's fat and then again telling them its saturated fat. Why not just say, saturated fat in the beginning, leave out the rest?"

Completed Sentence:	*The main [added in left margin] culprits are [added above the line] fast foods such as hamburgers, French fries and milkshakes each having 30, 11 and 9 grams of saturated [added in left margin] fat or more respectively which are the main culprits/ source of fats/ saturated fats [all this crossed out on 3 separate occasions].*

- The total does not make for ideal nutrition.
- The total is over 50 grams of fat.
- This is in a single meal.
- One expert recommends 10 to 20 grams of fat.
- The expert is Dr. Glen Griffin.
- This is a daily average.
- The daily average is healthy.
- We still get 42 percent of our calories from fat.
- This is four times the body's requirements.

As he read the sentence group through, Mike once again analyzed it, looking for main ideas and redundant words. "*This is…total is over 50…this is in a single meal*…hmmm…*We still get 42 percent…the expert is Dr. Glen Griffin.* I don't know. Do you have to say he's an expert? Doctors are very well educated already." He began writing with the name "*Dr. Glen Griffin*" adding the appositive modifier, "*an expert in nutrition.*" The idea of the fourth kernel sentence, "*10 to 20 grams of fat*," he added to the seventh and ninth with a relative clause and embedded adjective "*which is a healthy daily average*." Mike then suggested the unusual word "*wherein*" as a link to the final two kernel sentences, later changing it to "*where.*" The last kernel was reduced to a conjunctive phrase "*or four times the body's requirements.*" He tried embedding the adjective "*daily*" in this phrase, and comparing it to the "*un-ideal*" 50 grams of fat…in "*a non-ideal single meal.*" When asked, he explained his choice of the word "*wherein*" and "*where*" as follows: "Because 'where' is like…it includes…try and simplify, it says 42 percent is included in that, but it started getting complicated so…." He debated

whether he should have "started somewhere else" in joining that sentence group, but decided to leave it as it was.

Completed Sentence:	*Dr. Glen Griffin an expert in nutrition recommends 10 to 20 grams of fat which is a healthy daily average wherein [crossed out] which includes 42 percent or four times the body's calorie requirement which is [crossed out] compared to the un ideal [crossed out] un ideal 50 grams of fat in a single un-ideal [crossed out] non-ideal single meal.*

Richard Wagner had the emotional stability of a six-year-old. He felt out of sorts. He would rave. He would stamp. He would sink into a gloom. The gloom was suicidal. He would talk. His talking was dark. His talking was of going to the East. It was to end his days as a Buddhist monk. It was ten minutes later. Something pleased him. He would jump up and down on the sofa. He would stand on his head.

Mike did not recognize the name Richard Wagner, but understood that "usually the strange ones are the geniuses." He noted the German pronunciation of the name, and asked if he could mark up the printed paragraph. As he read, he immediately embedded the adjective "*suicidal*" in the previous kernel clause and changed the seventh and eighth kernel sentences into "*he would talk darkly.*" He used the contrast conjunction "*but*" to introduce the change in mood at the eleventh kernel sentence. He decided the first combined sentence, joining "*felt out of sorts*" to "*six-year old*" with the relative pronoun "*who*" and adding on the other actions as a list connected by "*and*" was a long one. He read this over several times, but made no permanent changes: "*Richard Wagner had the emotional stability of a six-year-old...who felt out of sorts and would rave and stamp...out of sorts...and...would rave and stamp...Richard Wagner had the emotional stability of a six-year-old who felt out of sorts and would rave...he felt out of sorts...six-year old...felt out of sorts and would rave and stamp... he would sink into a suicidal gloom...dot...he would sink into a gloom...a suicidal gloom...and would talk darkly about going to the East...going to East...to end his days as a Buddhist monk...*" He also joined the remaining kernel sentences, using "*and,*" but he did not repeat this part as

often. At this point, Mike was still working mentally, crossing out and adding words on the exercise sheet. Then he asked if he should write it down, and if he could add words, producing the following:

Completed Paragraph:	*Richard Wagner had the emotional stability of a six-year-old who felt out of sorts and would rave and stamp. He would sink into a suicidal gloom and would talk darkly about going to the [added in above] East to end his days as a Buddhist monk. But ten minutes later something would please him and he would jump up and down on the sofa and stand on his head.*

After the exercise was completed, we discussed several points about his experience. I asked him why he had used no metalinguistic terms, for example when he changed the adjective "*dark*" into the adverb "*darkly.*" Mike insisted that those terms had not crossed his mind as he made the change. He felt the first three sentence groups had been harder to combine because "the second one was more structured...the logic is almost there, you just have to change it a little bit. The first one was just a *whole* lot of sentences, and you have to sort of create your own logic to get it, so that would be a lot harder."

Interviewer Journal

Mike was, of all the students I have seen so far, the most self-conscious, so he spoke rather rapidly and quietly and often had to be prompted to keep talking or to speak louder.... Since Mike was a native speaker, there would be no need to replay the tape for foreign words. I decided that if I had any questions about his thinking on a specific sentence group, it was easiest to ask him at the end of that group instead of waiting until the end of the whole exercise.

Follow-Up Interview

Mike identified himself as a visual learner, with some kinesthetic preferences. When solving sentence combining problems, he was hearing words in his mind, but also noticed

redundant words that would "fall away" visually in his mind's eye. He is concerned enough about pronunciation to use rules of phonics to work out unfamiliar words, but does not often think about other rules of grammar while writing. Occasionally, he might worry about comma splices or spelling errors. He believes good style involves avoiding repetitions such as "and" and redundant pronouns; in fact, a good writer uses "as few words as possible" to convey his meaning. If he has time to revise an essay, he will "browse through" looking mostly for words he may have left out or possibly punctuation errors. He believes understanding complex sentence structures is a greater challenge when reading because "you can always look up words." He is also more concerned about sentence structure when writing, because he already has a good vocabulary in English.

The Fourth Interview: "Pucca"

Background

Pucca is the child of elderly Chinese parents. Her parents were of the generation that learned Russian, not English, as a second language. As a child, Pucca lived with her grandparents and met her parents only rarely because they worked in another city. She did not like school, finding the Chinese emphasis on multiple tests and constant homework very stressful. She began to learn English when she was 10 or 11 years old, starting with the alphabet and simple grammar, but moving on to a level of grammatical theory that was more complex than that taught in Canadian schools. Pucca does not feel she has benefited from this heavy emphasis on grammar, because her writing is still prone to errors. As an adult, she enrolled in the International Business program at a university near Shanghai, and did not come to Canada until she was in her 20s. Fortunately, she has learned to understand spoken English quite well, so that she feels that listening is her strongest skill. She still thinks in

Chinese and translates into English, a method that she knows weakens her writing. Even in Chinese she finds writing difficult; she prefers oral communication. However, she sometimes is able to read for pleasure in English, enjoying some detective stories, which should help her to build fluency.

Pucca frequently uses a dictionary to look up unfamiliar English vocabulary, and if a dictionary is not available she will try to skip the word and look it up in a dictionary later. She might also try to guess its meaning, or at least its grammatical role (noun or adjective), from the context. She has always had this practical, need-to-know approach to grammar; for example, although she was taught Chinese grammar in school, in using that language she relies more on her innate understanding than on theory. When writing English she worries more about her lack of vocabulary than about grammar as such; "when I'm writing English, I worry about the words. I didn't worry about ideas. I have a lot of ideas, and I can't write all of them…" Pucca remembers the sentence combining exercises she did in my English class, but she found them very difficult because, as she explains it: "I can't use Chinese to translate to English for combining sentence. I can't. They are different." She remembers that she did very poorly on the first sentence combining exercise because she translated the sentences directly from Chinese. She finds writing essays easier because she can use a repertoire of joining strategies and words–*because, so, however*–that she has memorized.

Sentence Combining

- It often becomes humid.
- It becomes humid in Toronto.
- It becomes humid in the summer.
- The humidity is extreme.

We discussed the rules for the think-aloud exercise, and I asked that Pucca say any words, Chinese or English, that came into her mind. I also asked her to think-aloud as she looked up words in her dictionary. Pucca had immediately spotted an unfamiliar word in the first kernel sentence, "*humid*," and she looked it up, finding that it was the same as "Cháo shī…like Shanghai's weather." She also noticed the similarities between the second and third kernel sentences and concluded that their ideas could be combined without repetition. She was unsure of the meaning of "*extreme*," but when prompted showed she understood it meant "strong." Although she could not pronounce "*humidity*" at first, she used it correctly in her sentence. When I asked her about the words "*humid*" and "*humidity*," she replied that one was a noun and one an adjective. After a little thought, she identified each correctly.

Completed Sentence: *It often becomes humid in Toronto in the summer, so the humidity is extreme.*

- Many Canadians have become health conscious.
- Their consciousness has increased.
- This is thanks to scientific studies.
- The studies were well publicized.
- Many Canadians still die each year.
- They die from heart attacks.
- They die from strokes.

Pucca found the longer word groups more difficult for several reasons. She did not know the word "*conscious*" (pronunciation or meaning) or "*publicized*" (at least to pronounce) and could not immediately see a logical way to join the first two kernel sentences, unless it was to use "*because*." She wondered if she could make the kernel sentences into two longer ones, but I asked for just one, so she quickly linked the rest of the kernel sentences, using "*although*" and "and." She did not make any changes after reading her sentences through.

Completed Sentence:	*Many Canadian have become health conscious cause [crossed out] because their consciousness has increased, this is thanks to scientific studies, although the studies were well publicized, many Canadian still die each year from heart attacks and strokes..*

- Saturated fats are the main culprit.
- Fast foods are a big source of such fats.
- These include hamburgers.
- These include French fries.
- These include milkshakes.
- A fast food hamburger has over 30 grams of fat.
- The fries have 11 grams of fat.
- The shake has 9 grams of fat.

Pucca spelled out an unknown word, "*culprit*," and looked it up in her dictionary before reading through the rest of the sentences. She was surprised at the meaning she found, "someone come to the prison," but moved on, reading through the sentence and checking back to confirm the meaning of "*saturated.*" As she wrote, she put a period after the word "*milkshake*" and I had to remind her to continue the sentence to the end of the group. She asked if she could use the same [joining] word twice in one sentence, and when I replied that you could according to grammar rules, she replied that "it looks ugly." She decided to omit the second mention of "*fast food*" and to vary her conjunctions by using "*because*" and later "*since.*" As she wrote, she laughed about the hamburger she had eaten recently, and how she had better not eat more or she would become fat. She combined the two lists of fast foods and their fat content easily enough, but when she finished she said, "I don't think that's good." Apart from switching the two conjunctions, she could not at that point think of any other improvements.

Completed Sentence:	*Saturated fats are the main culprit because [crossed out] since fast foods are a big source of such fats which [overwriting th] included hamburgers, French fries and milk shake. Since [crossed out] because hamburger has over 30 grams of fat, fries have 11 grams of fat and shake has 9 grams of fat.*

- The total does not make for ideal nutrition.
- The total is over 50 grams of fat.
- This is in a single meal.
- One expert recommends 10 to 20 grams of fat.
- The expert is Dr. Glen Griffin.
- This is a daily average.
- The daily average is healthy.
- We still get 42 percent of our calories from fat.
- This is four times the body's requirements.

As Pucca began reading the third sentence group, she recognized that its reference to a "*total*" must logically continue from the second group's list of fat contents. She read through confidently, looking up "*expert*" and finding it meant "professional," but seemed puzzled by the relationship between the numbers in the various kernel sentences. When told she could change the order of the ideas, she linked "*10 to 20 grams of fat*" to "*daily average*" and used "*and*" to link the last two kernel sentences. She asked if she could use "*by*" to "combine some sentence" and as she was pointing to the name, "*Dr. Glen Griffin*," I said yes since she was adding a noun, not a clause. Even with this correct passive construction, Pucca was unhappy with her sentence combining efforts, but did not feel able to improve on them immediately.

Completed Sentence: *The total does not make for ideal nutrition which is over 50 grams of fat in a single meal, one expert [crossed out] who [above it, also crossed out] the expert is Dr. Glen Griffin [further above and crossed out] recommends 10 to 20 grams of fat by Dr. Glen Griffin [added above] although this is a healthy daily average, we still get 42 percent of our calories from fat, and it is four times the body's requirements.*

Richard Wagner had the emotional stability of a six-year-old. He felt out of sorts. He would rave. He would stamp. He would sink into a gloom. The gloom was suicidal. He would talk. His talking was dark. His talking was of going to the East. It was to end his days as a Buddhist monk. It was ten minutes later. Something pleased him. He would jump up and down on the sofa. He would stand on his head.

Once again, Pucca scanned the passage for unfamiliar words before trying to read it through for meaning. She asked the meaning of "*rave*" and "*stamp*" which I explained briefly,

demonstrating the latter. She said, "Oh. So it is a verb!" and seemed to find that knowledge helpful as she read further into the paragraph. She recognized that the third and fourth sentences were illustrating the earlier ones, and first thought of using "*such as*" to link them, but then pointed out that "*such as*" just linked words, and "*for example*" was needed to introduce a clause. She automatically linked the fifth and sixth clauses with a relative clause "*which was suicidal,*" then debated using "*dark,*" which she recognized as an adjective, or "*darkly*" to modify "*talk.*" She inserted "*since*" to link "something pleased him" and used "*and*" to connect the ideas from the last two kernel sentences. Then she read through what she had written, finding when she stumbled over the pronunciation of "*suicidal*" that she was not sure of its meaning either, even though she had used it idiomatically in her writing. When I explained the meaning, she seemed surprised. She also admitted to uncertainty about the pronunciation and meaning of "*Buddhist monk,*" though I'm not sure my explanation helped her. She was satisfied with the rest of the paragraph and said "that's all" completing it in this form:

Completed Paragraph: *Richard Wagner had the emotional stability of a six-year-old. He felt out of sorts, such as [crossed out] for example, he would rave, stamp, sink into a gloom which was suicidal, talk [crossed out] and a dark talking. Since his talking was of [added in above] going to the East, it was to end his day as a Buddhist monk, after 10 minutes later, some [crossed out] he would jump up and down on the sofa, and stand on his head since something pleased him.*

As we discussed the experience, I learned that Pucca, like some of the others, had found the second, paragraph-style, activity easier than the first sentence groups. She had found the second and third sentence groups in the first part most difficult because she could not remember appropriate words to join them. She might have found it easier if she had recently had a lesson on ways to avoid run-on sentences or the rules of punctuation, but did

not find these tasks easy at any time. She could not compose complex sentences and at the same time remember all the vocabulary she needed for effective sentence combining and had to rely on a few terms which she could retrieve easily because they exactly translated from Chinese terms. These words are "because" and "since," two synonyms which translate to the Chinese as yīn wèi, and "although" which translate directly from sūi rán. At that point, I asked Pucca to write down the Chinese words for several words she had looked up, using Pinyin spellings so I could type them.

We also discussed alternative strategies for dealing with unfamiliar vocabulary. Pucca admitted to ignoring the exact meaning of words as long as she could understand their grammatical role in the sentence. She agreed that she was comfortable with grammatical terms like "verb" and "adjective" and when prompted added that she sometimes thought of syntactic terms such as "subordinate clause." As an example, she pointed to the second sentence where she had written "*which included hamburgers*." However, she could not express the actual words she had thought when she recognized that dependent relationship in the sentence: "I don't know how to explain that. I think this is…I just feel that should be "*which*" because they have the same germ [?], so I think they will talk about one things. So I think the second sentence I will use "*which*." Again, she was thinking as much about style–using a variety of sentence patterns–as she was about grammar.

Since Pucca had admitted to a number of vocabulary problems with the paragraph activity, I asked her for a brief summary of its meaning in her own words. She replied: "I think that he is a child that is…a little boy. He had some bad emotion, I think. Such as stamp…[inaudible]…This part I don't' know: 'his talking was of going to the East to end his days as a monk' I don't know what that means. After he said 'something happened so he

would'… do some actions such as jump on the sofa, stand on his head… I think that is [clearer]." At that point I encouraged her to look up "*monk*" and "*Buddhist*" in her dictionary, and she recognized then that "*monk*" was similar to "nun" and that "*Buddhist*" was a religion, like "Jewish." "*Going to the East*" was naturally a confusing phrase to her also, even when I explained that Wagner would have had to travel east to reach China from Germany. It is evident that one of the reasons for her difficulties is the European cultural background of the paragraph.

Interviewer Journal

Pucca spoke clearly when she was commenting on what she was doing but very quietly when she was reading words as she decoded the kernel sentences or wrote out her own, so although there are a number of words that the tape did not pick up, I can assume most of them are just this kind of reading. Again, words might not be audible on the tape, but they are written on her paper. Towards the third sentence group there are many inaudible words, but I thought (like Susan Tilley, in press) that it was better to lose a few words than to constantly interrupt, asking her to speak more loudly. There are some other things that cannot be transcribed effectively, such as mispronounced words and sentences read without phrasal intonation. In a way, it is not fair to expect shaped intonation when reading a grammar exercise like this, but it might show lack of understanding of the overall structure of the ideas. It may seem that I talked a lot at certain times, and the reason is not clear. Sometimes when I tried to explain something (how to do the exercise, the meaning of a word) Pucca did not seem to understand at first (I could tell from visual cues, not audible ones), so I would try elaborating until I got a clearer response. As with other students, we sometimes spoke

simultaneously, but this had to be transcribed separately. Also, I did not indicate every murmur or laugh, only those that seemed to affect the meaning of our exchange.

Follow-Up Interview

Pucca identified herself mainly as a visual learner who remembers words better if she sees them written. Her sentence combining experience was also partly visual, as she could "see words move and appear" as she linked them. When she encounters a word she does not know how to pronounce, she will "just read it" and perhaps check her dictionary later. For her, the meaning is more important than the sound. When writing, she often thinks of grammar, worrying in particular about verb tense. She dislikes repeating words when she is writing, but is less concerned about sentence variety. When she has time to revise an assignment, she first looks for grammar problems such as errors in verb tense, or misspellings. If she has time, she may try for "improvement of sentences," making them more complex. However, sentence structure is far less of a problem to her than vocabulary, which is harder for her both when reading and writing.

The Fifth Interview: "Ali"

Background

Ali is an Iranian, an engineer who worked in his field for 9 years before emigrating to Canada. He had learned English as a school subject in Iran, starting when he was 7 years old and continuing through high school and university, but he still found when he arrived here that his English was poor, especially in "listening and talking." He attended ESL classes for a few months, until he had to find a full-time job. He has attended Seneca College for a year, and although he benefits from his English reading and writing skills, he finds few opportunities to build his fluency in oral English. "The problem is many of my friends in the

college are Persian, and I speak Persian. My wife is Persian also; I speak Persian at home. And just learn English words and the rules sometimes. I am not good talking English, but my writing is so much better because in the high school we learned the grammar a lot, and essay–but no talking. And, that's why I'm understand grammar perfectly."

Ali was a good student who was able to study at the most respected high school in Iran. He began to learn grammar theory at this high school, beginning when he was 12. Perhaps because of his learning style, Ali finds learning grammar rules the easiest approach to a language. His Persian grammar is perfectly fluent, although he did not write a "very good essay" in his own language. He enjoys reading in both Persian and English and sometimes borrows books of short stories to read from the library. At university, he worked in the Turkish-speaking Azerbaidzhan province of Iran, but his knowledge of Turkish is purely at the survival level, such as he needed to order food. As an engineer, he often finds it easier to express his ideas in mathematical terms than in words–of any language.

When he is writing English he does not have much trouble with vocabulary. He is usually able to guess the meaning of an unfamiliar word by looking for a familiar root or similarity to another known word. However, he finds that worrying about perfect grammar distracts him when he is writing and makes it more difficult to concentrate on the meaning of what he is trying to say. Perhaps this is because Ali can "think" in English when faced with simple tasks, but not when writing essays or answering questions in an interview. He very much enjoyed sentence combining exercises when he was in my class, because they were "like a game for me." He prefers them to both traditional grammar exercises and essay writing, although he believes that learning grammar is important in English.

Sentence Combining

- It often becomes humid.
- It becomes humid in Toronto.
- It becomes humid in the summer.
- The humidity is extreme.

Ali solved this simple sentence combining task very quickly, almost as I was explaining the rules for think-aloud to him. He thought the talking helped him to think of ways to join the ideas, but explained that although the kernel sentences reflected the English thoughts he might have or speak about the weather in real life, for the longer, more complex combined sentence he would have to think in Persian.

> …and to talk about this…the weather… I cannot… I can but it's hard to …I have to think in Persian about the humidity and summer and … If I want to talk to my friend, I would just say, "It's humid in summer" and then say, "Summer's always humid."
> I – So these shorter sentences, what they call "kernel sentences," are a little bit more like the way second language people may speak?
> P – Yea. Yes, it's like the second languages speak.

Nonetheless, he did not think in Persian while combining the kernel sentences for the purposes of this exercise, because he used English to find redundant information and add conjunctions.

Completed Sentence: *It becomes humid in Toronto in the summer, and the humidity is extreme.*

- Many Canadians have become health conscious.
- Their consciousness has increased.
- This is thanks to scientific studies.
- The studies were well publicized.
- Many Canadians still die each year.
- They die from heart attacks.
- They die from strokes.

Ali began by reading through the kernel sentences, with a rising intonation after each; then he quickly began writing, while trying to find a way to include the idea of "increased" into the first kernel sentence. He spoke the sentence aloud, pausing where a modifier might be inserted, but unable to think of one, as he tapped the second kernel sentence with his pen and said, "I like to relate '*increased*' to '*health conscious.*'" He eventually decided to use the noun form "*health consciousness*" to create the clause "*health consciousness has increased.*" Once he had made this combination, he was able to string together the rest of the ideas quickly and easily. He read the sentence through, but did not find any errors in grammar.

Completed Sentence:	*Many Canadians have been* [crossed out] *The health consciousness has increased in Canadians health and this is thanks to scientific studies which were well publicized, but many Canadian still die each year from heart attacks and strokes.*

- Saturated fats are the main culprit.
- Fast foods are a big source of such fats.
- These include hamburgers.
- These include French fries.
- These include milkshakes.
- A fast food hamburger has over 30 grams of fat.
- The fries have 11 grams of fat.
- The shake has 9 grams of fat.

As he attacked the next group, Ali began with the second kernel sentence, only inserting the modifier "*saturated*" when prompted: "*the fast foods... are a big source of such fats*...I repeat... *a big source of saturated fats... fats*... ah...*which... are... main...culprite*...." He did not know the exact meaning of the word "*culprit*" but did not seem to need it to understand the main idea of the sentence group, and he was able to quickly link the rest of the ideas in list form, the first one embedded as a noun phrase modifying the main subject "*fast foods.*"

Completed Sentence:	*The fast foods* [the following words entered with an arrow from the line above] *include hamburgers, French fries, and milkshakes are a big source of saturated fats which are the main culprit, because a fast food hamburger has over 30 grams, and fries hav* [sic] *11 grams, and the shakes has 9 grams of fat*

- The total does not make for ideal nutrition.
- The total is over 50 grams of fat.
- This is in a single meal.
- One expert recommends 10 to 20 grams of fat.
- The expert is Dr. Glen Griffin.
- This is a daily average.
- The daily average is healthy.
- We still get 42 percent of our calories from fat.
- This is four times the body's requirements.

Ali once again attacked the sentence group quickly and confidently. This time he had a little more difficulty finding the "subject" or main idea of the combined thought, although he did not have trouble combining many of the subordinate ideas, like the identity of Dr. Glen Griffin or the relationship between the two final kernel sentences.

> *The fast food... fat... doesn't... the fast food fat which is...over... 50... gram of fat... doesn't ... make ...for... ideal... nutrition... and... because... ah... Dr.... Glen.... Griffin... who is... ah... expert... recommends... 10 to... 20 grams... of fat... ah... and... the total...the total... fat... in a... single... meal... of fast food... fast food... is over... 50 grams... of fat... we still get... and... and... we still get... 42 percent... of our calories... from fat... which... is... four... times... the body's... requirements... in the daily... daily average... of health.* I think it's not perfect, but… the thing is, I couldn't understand if "*this is a single meal*" is related to this doctor's opinion or related to the fat in the fast food.

Although I tried to explain that the doctor's opinion related to the amount of fat we should eat in a day, while the single meal referred to the hamburger, French fries, and milkshake of the previous sentence, Ali did not choose to make any further changes to his sentence.

Completed Sentence:	*The fast food doesn't* [crossed out] *which is over 50 gram of fat does not make for ideal nutrition, because Dr. Glen Griffin who is expert recommends 10 to 20 grams of fat, and the total fat in a single meal of fast food is over 50 grams of fat, and we still get 42 percent of our*

calories from fat which is four times the body's requirements in the daily average of healthy.

Richard Wagner had the emotional stability of a six-year-old. He felt out of sorts. He would rave. He would stamp. He would sink into a gloom. The gloom was suicidal. He would talk. His talking was dark. His talking was of going to the East. It was to end his days as a Buddhist monk. It was ten minutes later. Something pleased him. He would jump up and down on the sofa. He would stand on his head.

As he read through the kernel paragraph, Ali sounded puzzled at several points, including with the idioms "*out of sorts*" and "*going to the East.*" He had trouble pronouncing the word "*suicidal*" as well. When asked if he would like any part defined or explained, he asked about "*stability*" first: "emotional stability means he couldn't stand up and… he wasn't stable in standing…?" and then "*rave*" but once those were explained he began writing and joined ideas smoothly until once again he came up against "*out of sorts*" which he guessed to mean "isn't normal" but could not easily fit into his syntax. He wrote some more: "*felt out of sorts… and… would… rave and stamp… and sink into… a gloom … of a…six… six-year-old… ah… He would talk… his talking was dark…his talking was of going to the East… which was to…* these are idioms…." I explained that a German would go east to reach Asia, and asked if Ali knew what "*Buddhist monk*" meant. He did, but still seemed puzzled by its relationship to the rest of the paragraph. However, he used that kernel sentence to start the final sentence of his paragraph, followed by the remaining four kernel thoughts, combined more easily.

> *It was to end his days as a Buddhist monk it was ten minutes later something pleased him…* Hmmm. *It was to end his days as a Buddhist monk… it was … to end… his day… as a… Buddhist… monk… and something… pleased him… ten minutes… later… and… he would jump… up… and down… on the … sofa… and… stand… on his head*

Reading the paragraph over, we noticed that Ali had omitted the idea of "*suicidal.*" The word sounded familiar to Ali, but he could not precisely define it. When it was explained

he decided to join it to "*gloom*" in the relative clause "*which was suicidal.*" Then he read his paragraph over again and was able to sense that "the first sentence has problems, but I'm not sure what's the problem…" so I offered to make a few suggestions for improvements and see if that would make a difference. First, I pointed out that the modifier phrase "*of a six-year-old*" which had made sense coming after "*gloom*" did not sound idiomatic coming after the new inserted clause "*which was suicidal.*" I also pointed out that the predicate of his first sentence "*had emotional stability*" lost its meaning when he removed the qualifier "*of a six-year-old*" and perhaps it should read instead "*emotional* in*stability.*" Ali had difficulty understanding most of what I had said, but he did change "*which was suicidal*" to the embedded adjective "*suicidal gloom*" which made a more idiomatic phrase "*suicidal gloom of a six-year-old.*"

Completed Paragraph:. *Richard Wagner had the emotional stability, and felt out of sorts, and would rave and stamp and sink into a suicidal* [added in with arrow] *gloom* <u>*which was suicidal*</u> [below, crossed out] *of a six-year-old. He would talk, and his talking was dark and was of going to the East. It was to end his days as a Buddhist monk, and something pleased him ten minutes later, and he would jump up and down on the sofa and stand on his head.*

After he had finished the exercise, Ali and I discussed the experience. I once again asked if any Persian words had entered his mind and he admitted that as soon as he read through the paragraph, he had thought the word "pichideh" which means complicated. When he had tried to understand an unfamiliar word such as "*suicidal,*" he had guessed the meaning using context clues. "I got the general idea about this paragraph. It talk about a person who has a his-tric [hysteric] situation…and my idea of what the '*suicidal*' was a person who has hysteric actions." Because he had been working "as fast as I can" Ali did not think about grammatical theory and no metalinguistic or grammatical terms had entered his mind. I asked

him if he had made a point of avoiding run-on sentences, since he was the only one of the ESL participants who had succeeded in doing so, but he said he had not. After the tape was stopped, we discussed which of the two sections Ali had found more difficult, and he said it was the second (paragraph) one because in part one he could understand all the kernel sentences, thinking in English, but in part two, he thought in Persian at first just to get the main idea. This is his translation of what he had thought: "*The story about a person who is abnormal in behaviour and then went to some Buddhist temple and got better after.*" Once he had worked out this "gist" of the story, he used English thinking "to find the sentences that has the same idea" so that he could join them.

Follow-Up Interview

Ali's self-test revealed him to be a visual and kinesthetic learner. We discussed the effect this learning style had on his approach to the sentence combining problems. When I asked if he had visualized words, he agreed that when he read words, images appeared in his mind. For example, the second sentence group had created an image of hamburgers, French fries, and a milkshake, sitting on a table together. However, he did not see printed words in his mind. Ali's strategy for pronunciation of unfamiliar words is to guess by thinking of another word which looks the same, such as a word with the same vowel in the same place. When writing essays, he does focus on grammar rules, but when talking he cannot. "If I think about grammar while talking, it makes trouble for me." In fact, worrying about a grammar factor such as subject-verb agreement has often made him lose his train of thought. He does not think about style when writing essays, but with time to edit he will try to correct errors in vocabulary or verb tense. After he has finished writing, he says, "I cannot add anything. It makes me nervous." He believes sentence structure has been harder for him to master than

vocabulary, both when writing and reading. "When I want to write a big sentence, I worry about the structure: connections, tenses." That said, he does need many repetitions to memorize new vocabulary and still cannot always use the words idiomatically. "Sometime I know the vocabulary but I cannot use them."

Conclusion

The 5 participants that volunteered for the interviews proved worthy of study in a number of ways. They came from widely different language backgrounds: Arabic, Romanian, English/Afrikaans, Chinese, and Persian. Although all were in their 20s or 30s, so of similar developmental age, their background interviews revealed them to also represent a range of educational histories and intellectual interests. They tackled the demands of sentence combining problems and think-aloud in often similar ways, but also revealed more individual reactions to the task, both directly and indirectly. In spite of inevitable problems associated with transcribing simultaneous dialogue and with the opaqueness of think-aloud utterances, thick description of think-aloud interviews has offered focused pictures of many of the strategies and processes involved as adult learners work with language-based tasks. These pictures will be interpreted through several theoretical "lenses" in the next chapter.

CHAPTER SIX: DATA INTERPRETATION

Reflections on Sentence Combining

In 1986, when William Strong, the most enthusiastic popularizer of sentence combining as a pedagogical tool, called for "more descriptive research to examine stages that students go through in learning from sentence combining" (p. 7), he probably envisaged highly structured, quantitative studies. He also intended that such studies examine the effects of many hours of sentence combining exercises–even a whole term's worth. Nonetheless, this qualitative exploration, through "thick" description, of 5 participants' experiences with one sentence combining exercise has offered some interesting points of view and insights that a more impersonal quantitative study might not have achieved. It has invited examination by reducing and classifying the data in light of several facets of learning and psycholinguistic theory and by comparing its data to those of the previous think-aloud study (K.E. Johnson, 1992). Such interpretation has provided possible answers to, or at least clearer focuses for, questions I posed in Chapter Two, and especially in answer to the central question, "What is going on in my students' minds when they combine sentences?"

Sentence Combining and Thinking

The participants' experiences have permitted a better understanding of both the process and outcomes of sentence combining. For instance, their actions support Strong's (1985) contention that sentence combining problems are constructivist tasks. Perhaps sentence combining could qualify as one of the constructivist "experiences that induce cognitive conflict and hence encourage learners to develop new knowledge schemes" (Driver et al., 1994, quoted in Merriam & Caffarella, 1999, p. 262). Whatever the cognitive implications, students were "doing, not thinking about doing" (p. 346). This is borne out by the

participants' almost total concentration on reading and writing alone and their lack of metalinguistic utterances. Their behaviour also accords with R.A. Hunt's (1985) theory that the "revision" aspect of the writing process, at least when working at the sentence level, is interspersed with analyzing and composing, and not a separate stage. None of the participants made any significant changes to their sentences when asked to read them over at the end, although they all made adjustments in the process of writing their sentences down; their longer sentences, in particular, all contained word groups crossed out or added in. Most important while working on the problems, all participants employed higher level thinking, including analysis, synthesis, and, to a lesser extent, evaluation (see Bloom et al., 1956), as shall be shown later. Participants all began by analyzing the kernel sentences, breaking down their meaning to locate main ideas and isolate unfamiliar and redundant terms. Although the participants did not combine the sentences with equal effectiveness, all used synthesis to decide on appropriate "cohesive devices" and changes in word order. Their processes provided some support for Strong's (1985) hypothesis that the human brain cannot analyze and synthesize at the same moment, since all participants analyzed first before they joined their sentences, but with some of the simpler word groups one stage followed on the other extremely rapidly. Thus, in the first sentence group, for example, most participants joined the last three kernel sentences ("Many Canadians die each year/They die from heart attacks/They die from strokes") without the analysis stage appearing in their think-aloud speech. To explain this, it is worth considering Van Patten's (1985, 1989) related theory that second language learners cannot focus on both meaning and form at the same time. This theory may be an overgeneralization in the case of sentence combining, because the kernel sentences provide meaning in small chunks that are easy for ESL learners to understand. According to Ali, they

even mimic a stage of "interlanguage," the level at which he was able to think in English, so that he could manipulate them without having to translate to and from his L1. As Van Patten (1989) concluded, "only when input is easily understood can learners attend to form as part of the intake process" (p. 414). Thus the presentation of the sentence combining word groups made it easier for ESL students to address questions of form than would a more traditional comprehension and writing assignment. Perhaps this breakdown into simple kernels of thought also allowed them to analyze and immediately synthesize some sentence parts. This is an interesting point which may invite further research (see next chapter for further discussion). Because each participant may have studied with me as much as a year before the interview, it is harder to draw conclusions about the outcomes of sentence combining based on what is in effect a single lesson. There is certainly no evidence that sentence combining helps students to avoid rule-based errors such as run-on sentences, since all but Mike (the native speaker of English) and Ali produced several comma splices, but this reflects a weakness in knowledge of punctuation rules rather than syntax. Similarly, a 1982 study by Argall (cited in Strong, 1986) found that after 5 weeks of steady sentence combining, her college freshmen were producing far fewer sentence errors than at the beginning of the term but that they still had trouble with the correct use of the semicolon. Some participants also made syntactic errors, but this may have been because they were attempting to solve sentence combining problems at too advanced a level (see below), or felt too pressured by time to revise them adequately.

The more central question remains: Do students in general benefit more from a few, short lessons in sentence combining than they would if the same time were devoted to traditional grammar? Every one of the participants claimed to prefer sentence combining to

traditional grammar, which may support the exercises' motivational benefits, although only Ali identified them as an enjoyable "game," and Pucca admitted to having found them very difficult, especially at first. What are the benefits of a limited experience with sentence combining then? Strong (1985, 1986) argued for long, intensive courses of sentence combining allowing students to build automaticity in complex sentence skills, but there is some evidence that repetition alone will not promote automaticity in language acquisition. As Van Patten (1989) found in his experiment with Spanish students, some linguistic forms were more difficult to master than others, no matter how frequently encountered. He concluded that it is a mistake to suppose all forms can be learned simultaneously. Perhaps this is because different areas of the brain are activated in the different types of learning required to learn different aspects of language. According to Damasio and Damasio (1992), "the subcortical circuit corresponds to 'habit' learning, whereas the cortical route implies higher-level, more conscious control and 'associative' learning" (p. 93). This may explain why Van Patten's (1989) subjects could not focus on repeated aspects of form at the same time as they tried to comprehend the meaning of a spoken passage, finding that "a constant and conscious awareness of their presence seemed to interfere with comprehension" (p. 414). The higher level thinking involved in analysis of the passage (meaning) surely qualifies as "associative learning," while Van Patten's task, listening for and marking certain verb endings and articles, resembles lower level or "habit learning." Probably this rote task monopolized STM, making higher level thinking more difficult for the listeners. The cognitive dichotomy between the two levels of learning may also relate to the phenomenon that Newport (1994) and others explored–the perceived incompatibility between second language acquisition and higher level thinking in adults. This incompatibility may appear in exercises that stress rote learning of

unfamiliar grammar rules or literary terms (form) while at the same time expecting strong grasp of content (meaning). My participants' experience implies that higher level thinking can more easily occur in "natural" language tasks, which seem to include sentence combining.

By and large, my participants' approaches to the sentence combining task favoured "associative" rather than "habit" level thinking, maybe because of its syntactic nature. As cognitive theory asserts, "the thinking person interprets sensations and gives meaning to the events that impinge upon his consciousness" (Grippin & Peters, 1984, quoted in Merriam & Caffarella, 1999, p. 253). This theory explains why, as Van Patten found and my study supports, students both listening to and reading language naturally look for meaning first–the "gist" of the passage, which involves higher level thought. They may often ignore forms that do not seem important to meaning, as for example Ben did when he used the verb "talk" and gerund "talking" interchangeably. Of course, the meaning of his sentence suffered because of this weakness in understanding of form. After all, in written language, precise meaning cannot be divorced from form. Thus, in looking for meaning, a good reader *must* pay some attention to form. The reality is, however, that in a long reading comprehension passage, and especially for weaker readers or second language learners, that attention may be cursory. The benefit of sentence combining exercises for *reading* comprehension is that they compel the student to notice forms not only at an "associative" level more frequently than they would reading short stories and essays, but also at a rate suitable to their own level of language acquisition or "syntactic maturity" (to use Mellon's, 1969, term). In pedagogical terms, perhaps, they are encouraged to notice more forms within their "zone of proximal development" (Vygotsky, 1962). Thus the benefits of sentence combining are related as much to its promotion of "associative learning" or analytical understanding of form as to its promotion of automaticity

in using the forms through "habit learning" (repetition; Damasio & Damasio, 1992). This conclusion supports the inclusion of sentence combining at several intervals throughout a course as students' language skills develop, instead of "all at once." Such widely spaced lessons have been my practice and that of many other language teachers (see for example Brereton, 1982). It is possible that Strong's (1985) recommended full term of sentence combining would build greater automaticity as well as encouraging "associative learning" of these advanced forms. However, as all but one of this study's participants preferred more open-ended writing assignments such as essays, I imagine such a program would be unpopular as well as unpractical. (For further discussion of this point, see next chapter.)

Evidence of Variability in Individual Response to SC

In Chapter Two, I questioned why the efforts of the "sentence combining" movement in the 1980s failed to find a comprehensive theory explaining why sentence combining works. My speculation was that it was due to the wide variety of individual reactions to the tasks. This collective case study has, in fact, found such differences in student response to the sentence combining task which may be related to, among other factors, their individual cognitive approaches to language, their more general, perceptual learning styles, and even their specific values and preferences related to writing.

In Chapter Three, I anticipated that participants who were ESL would use their L1 to translate the passages as they tried to work out their meaning, but when my participants were "thinking-aloud" their few L1 utterances were of single words–lexical translations–not whole clauses or sentences. None of them used translation to understand meaning contained in syntax. This observation may have significant meaning when interpreted in the light of recent psycho-linguistic theory. The popular writer and theorist Steven Pinker (2000), in his

introduction to *Words and Rules: The Ingredients of Language*, uses the metaphor of "two tricks: words and rules" that contribute to the miracle of human language. Pinker goes on to explain that these two tricks " work by different principles, are learned and used in different ways, and may even reside in different parts of the brain" (p. 2). "The first trick, the word, is based on a memorized arbitrary pairing between a sound and a meaning"; thus acquiring words, or what Pinker refers to as entries in our "mental dictionaries," at least initially may employ lower level thinking or "habit learning" (pp. 2-3). The second trick of generating sentences operates differently. The meaning of sentences comes not only from their words, but also from the order of the words, or their syntax. Psycholinguists such as Pinker (and of course his colleague Chomsky) believe that much of this syntactic production is governed by an unconscious cognitive process called a "generative grammar" (p. 4). This enables learners to constantly understand sentences they have never heard before, a skill they cannot apply to unfamiliar words. However, conscious thought may also play a role in syntactic understanding, particularly when the syntax is complex or confusing, as in a sentence combining problem. This may be even more true where the learners are adults (see next chapter). The L2 utterances of my participants reinforce Pinker's (1994, 2000) argument for two distinct facets to acquiring a second language and suggest that "words" and "rules" may challenge different learners in different ways. To explore this issue further, I have tabulated the variations in syntactic and lexical understanding among this study's 5 participants (see Table 1).

Table 1

Variations in Syntactic and Lexical Understanding

Name	Syntactic strengths/weaknesses	Lexical strengths/weaknesses
Ben	Weak ability to comprehend meaning created by syntax, or insert embedded ideas in a sentence. Failed to notice or eliminate redundant words. When writing, finds sentence structure more difficult than vocabulary; when reading may ignore subordinate ideas and focus on main ideas only.	Strong interest in phonetics (pronunciation of words), morphology (role of prefixes and suffixes), parts of speech, word meaning (able to deduce from root).
Eliza	Large repertoire of joining strategies (relative clauses, appositives) Not troubled by English syntax, perhaps because it is similar to L1 of Romanian (as is another Romance language, French).	When reading, can decode unfamiliar words by using a dictionary. When writing, frustrated by her limited vocabulary and lack of "elevated" words.
Mike	A native speaker and well-read; quite adventurous in his efforts to manipulate the sentences, radically changing the order of ideas and omitting redundant information. Used embedding a great deal more than ESL participants. When reading or writing finds sentence structure more difficult than vocab ("you can always look up words").	Believes he has a strong vocabulary, but unwilling to ask/look up unfamiliar words in this exercise. Uses phonics rules to work out pronunciation of unfamiliar words.

(table continued)

Name	Syntactic strengths/weaknesses	Lexical strengths/weaknesses
Pucca	When combining sentences found it impossible to think in Chinese. Used a repertoire of memorized combining strategies (subordinate conjunctions *because, since, although*). Read kernel sentences for meaning and chose a conjunction that seemed to fit. Often used an unfamiliar word correctly in a sentence by deducing its grammatical role (adjective, verb) from the phrase syntax. Did not use syntactic metalinguistic terms such as clause, subordinate. Did recognize that "*which included hamburgers*" was a subordinate clause, when asked for an example. When reading sentences did not add intonation to suggest understanding of syntactic flow.	Did use dictionary, questioning and translation from L1 to decode specific words. Believes vocabulary is her greatest weakness in English. Attacked each sentence group by first scanning it for unfamiliar words. Was aware of morphological differences (e.g. between *humid* and *humidity*). Made some errors in morphology when speaking (e.g. omitting the plural "s") but wrote the words down correctly. Could not compose complex sentences and at the same time remember all the vocabulary she needed for effective sentence combining. Finds vocabulary a stumbling block to both reading and writing English.
Ali	Recognized that the kernel sentences were at the level of English he was comfortable reading and writing (or speaking). Looked for English clues within them to help him join them into longer sentences, but did not see the logical weaknesses in his final, more complex sentences. Could not understand the way the removal of the modifier "of a six-year-old" changed the meaning of the term "emotional stability." Had trouble both writing and reading long, complex sentences.	Could use root words to work out unfamiliar meanings, or use context cues, but if precise meaning was unclear would not stop and look up word or ask. Inability to understand the difference between *stability* and *instability* may reflect some weakness in morphological decoding. Has to repeat continuously to learn new vocabulary. Recognizes more words than he is able to use productively.

The experiences outlined in this table highlight a critical facet of language development that educators often overlook or discount: the problem of lexical skill at both the decoding (analysis/reading) and encoding (synthesis/writing) stages. Perhaps this is because most college level writing programs, including sentence combining, were originally developed with native speaking students in mind. However, although the participants who struggled the most at the lexical level (Pucca, Ali) also had problems syntactically, a comparison among the ESL participants does not suggest that lack of lexical sophistication merely reflects an overall low level of language acquisition. Ali, for example, had fewer syntactic problems than Ben, but was weaker in lexical and morphological understanding. More likely, different learners experience different success rates with the two strands for a variety of reasons. One reason might be the similarity of the L1 to English, since Eliza's strong understanding of English syntax may be due to its similarity to Romanian, but this would imply that native speakers of English should be uniformly strong in both areas. This is not the case. As his former English teacher, I can attest that Mike scored better on vocabulary quizzes than many of my native-speaking students. This would not be surprising to cognitive theorists. Even though it initially involves lower level thinking, building a "mental dictionary" is in many ways a more demanding language development task than acquiring a sophisticated grasp of grammar.

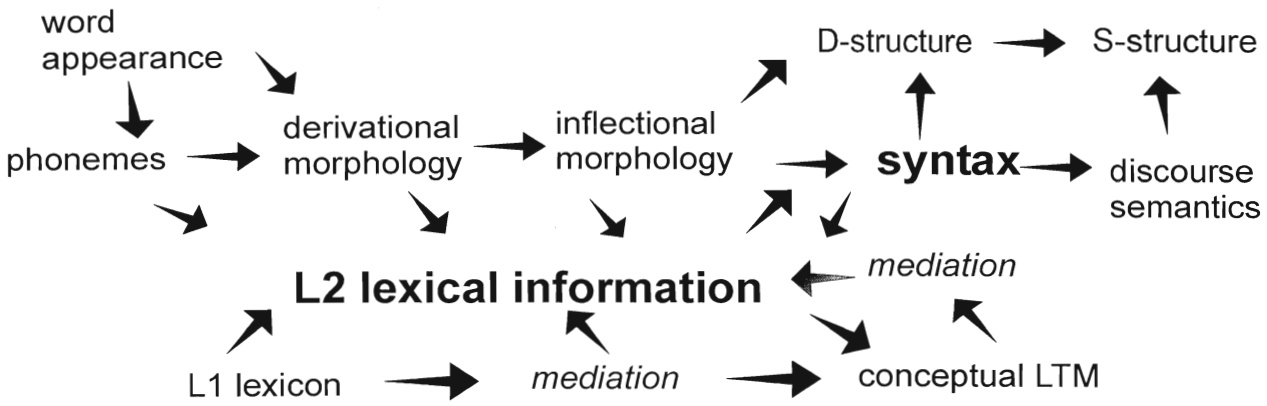
> The smallest unit of thought that can be expressed as an independent percept is a word. Because a word is a constant percept in our experience, we treat the thought it expresses as a constant thought–even though in fact we bend and stretch the concepts expressed by words every which way, especially in the

process of combining them into sentences by coercion and cocomposition. (Jackendoff, 1997, p. 206)

Even for highly educated native speakers of a language, word meaning is imprecise, variable, and constantly developing. As Chomsky (1993) states it, "the most elaborate dictionaries provide no more than bare hints about the meanings of words" (p. 23). Aitchison (1994) points out that when we analyze the word we have to grapple not only with two halves of a "coin" comprised of meaning and word class (noun, verb, adjective), but also phonology and morphological structure and (in the case of written language) visual appearance. Aitchison also notes that the links between these many aspects of a word are "fragile" and "easily broken" (pp. 222-223), and not all individuals can access all aspects with equal ease. Moreover, the picture becomes even more complex when you factor in links to an L2 learner's L1 lexicon.

It is not surprising, then, that different participants approached the vocabulary in the sentence groups in very different ways. Pucca, for example, could recognize the class of a word fairly easily, an aspect of the lexicon that is cued by basic syntax, but had much more difficulty interpreting meaning. You might call this the "Jabberwocky" syndrome, for I have found that most students, including ESL students, can identify the parts of speech of the nonsense words in Lewis Carroll's poem (*brillig, slithy toves, gyre and gimble,* etc.) while none of us, even Alice, could define their meaning. Alice's reaction, "Somehow it seems to fill my head with ideas–only I don't exactly know what they are!" (Carroll, 1976, p. 155), may echo the experience of many ESL students reading English prose. Other students, such as Ben, understood and correctly used the phonology and core meaning more than word class; for example, Ben confused the verb and noun (gerund) form of "to talk."

Thus, words alone are complex enough to represent a whole series of "inputs" into the mental code that creates sentences. However, there are many other processes involved, both conscious and unconscious. According to Pinker (1994), deep structure (or D-structure), the underlying order of ideas that creates a meaningful sentence, is "the interface between the mental dictionary and phrase structure" (p. 115). Most participants, when they analyzed the sentence groups looking for the "main point" or central meaning, were in fact working out this deep structure, and when they synthesized their new sentences, they were attempting to create a new deep structure, albeit one that was sometimes flawed (for example, when Ali juxtaposed "which was suicidal" with "of a six-year-old"). The following diagram, adapted from Tager-Flusberg (2001) to include the impact of L1 lexicon and adult conceptual LTM, illustrates to some extent the complexity of the sentence writing task in psycholinguistic terms. It also explains why most participants, even the native-speaker Mike, found sentence structure a challenging aspect of writing in English.



To roughly translate this diagram into more traditional metalinguistic terms, phonemes are the parts of the word (letters, diphthongs, etc.) that indicate its sound, derivational morphology is the "root" of the word, and inflectional morphology the prefixes and suffixes. D-structure is the underlying meaning of the sentence, while S-structure is its surface

organization. Discourse semantics refers to the meaning created through relationship between sentences within a passage of speech or writing. The stages marked *mediation* represent Damasio and Damasio's (1992) conception of points of interface "between the brain's concept-processing systems and those that generate words and sentences… which not only select the correct words to express a particular concept, but… also direct the generation of sentence structures that express relations among concepts" (p. 93). These mediation points may also correspond to Jackendoff's (1997) "intermediate ring" of conscious thought between the unconscious "sensorimotor periphery and the cognitive interior" (p. 189); that is, they represent stages where higher level "associative" thinking may occur.

How likely is it that all learners, including those who are ESL and those who are native speakers, follow these sequences in the same order or even use the same order for all sentences? There is scope for enormous individual variability here, beyond any simple idea of "level" of language acquisition. Take the example of Pucca, who was the only one of the participants to analyze her sentences primarily at the lexical rather than syntactic level. She also generated sentences using a series of memorized cohesive strategies (*although, since, because*). As Damasio and Damasio (1992) wrote: "It is likely that both cortical 'associative' and subcortical 'habit' systems operate in parallel during language processing. One system or the other predominates depending on the history of language acquisition and the nature of an item" (p. 93). If this is true, Pucca's approach to reading and writing English may reflect her early language acquisition in a Chinese school, where "attention, discipline, whole class instruction, recitation and drill characterize classroom instruction" (Ashmore, 1997). For Pucca, rote memorization, necessary for students mastering the 10,000 Chinese ideograms, was also emphasized when she first learned English and is her default learning strategy to this

day. Although Pucca did employ "associative" or higher level thinking, for example to find the main idea of the paragraph about Wagner, she was less successful than the other participants in doing so. Probably, then, a student's history of language learning affects his or her cognitive approach to sentence combining, as to other reading and writing tasks, and provides one possible explanation for the fact that L2 learners do not acquire all lexical and syntactic forms in the same order.

Other causes of individual variability may well include general (as opposed to linguistic) learning style. Different theorists have proposed many divisions of learning styles, but for this sample I chose one of the simplest: the three perceptual categories of visual, auditory, and kinesthetic learning. For a breakdown of the 5 participants according to the learning styles they identified through the short questionnaire (see Appendix F) and according to the strategies they used solving the sentence combining problems, see Table 2.

All participants exhibited a combination of learning styles, but they differed in emphasis and blend. There is no need to discuss the cognitive basis of learning styles here, but merely to observe that they may represent yet another reason why a single, universal theory of sentence combining has been impossible to finalize.

One final category of individual variability which is harder to define in scientific terms is that of personal priorities and values when it comes to writing. I have noticed on several occasions that, when solving sentence combining problems in a group, a student will often reject a partner's sentence even though it is grammatically correct. Students seem to want to reshape the sentences in their own "voice" (See Appendix B). This study's 5 participants wrote in very different "voices" that reflected the different degrees to which they cared about the accuracy, meaning, and aesthetic style of their writing, and these differences

Table 2:

Learning Styles

Name	Visual strategies	Auditory strategies	Kinesthetic strategies
Ben Test results mixture of VA	Stated that when he was pausing or stalled on a few words, he was "looking for solutions." Possible visual reaction to supposed meaning (e.g. Wagner at a rave)	Read the words over and over in different tones of voice. Talked about his random thoughts in relation to what he was reading. Frequently uses online pronunciation resources. Spoken English stronger than written.	Writes out a word to determine if it is spelled correctly. (Questionnaire)
Eliza Test results mostly V	Said it was easier to concentrate when the words were written down, and that she saw the words visually in her "mind's eye" not just heard them. Prefers writing to speaking. Remembers notes better when she has high-lighted them. Does not try to "pronounce" un-familiar words in her mind.	Tested combination strategies orally before writing them down. Could not manipulate words visually in English (might be able to in L1).	Learns by doing. Enjoys the feel of words flowing as she writes. (Questionnaire)
Mike Test results mostly V	For Part 2 used a pen to revise (delete, add, change, move words) before writing sentences out. Found this part easier in the end. When solving SC would notice redundant words seem to "fall away" in his mind.	Read rapidly, barely pronouncing function words (prepositions, pronouns or copula verbs). Experimenting aurally with embedded meanings. Considers himself stronger at oral communication. Uses phonics to determine accurate pronunciation.	Likes learning through hands on activities (student centred).

(table continued)

Name	Visual strategies	Auditory strategies	Kinesthetic strategies
Pucca Test result V:A = 60:40	Visualizes what she is reading in her mind's eye. (Questionnaire) Remembers words better if she sees them written. Can see words move, appear as she links them while solving SC.	Claimed that listening comprehension was her strongest skill in English. When reading sentences did not add intonation to suggest understanding of syntactic flow. Prefers oral communication in her L1.	None identified.
Ali Test results VK	Likes using mathematics, not words, to express ideas. Reading created pictures (hamburger, fries, and shake on a table together) but not written words in his mind. Guesses at pronunciation by looking for simi-larities with other words.		When having trouble with a word (looking for an adjective form of *increased*) tapped the word with his pen.

are tabulated below (see Table 3). Some of their preferences may be dictated by previous learning experiences, learning style, or the difficulty of noticing form and content simultaneously (for example, Ali's inability to analyze grammar while revising for meaning). But other differences, particularly in ideas about aesthetics of sentences, are less easy to predict. Why, for example, does Eliza admire long, sophisticated sentences while Mike has a more minimalist taste, preferring meaning to be expressed in as few words as possible? These preferences may arise from a host of influences throughout their lives. The sources of such values and priorities might also be an interesting topic for further qualitative research.

Finally, the Critical Period Hypothesis, which predicts that ease in learning certain aspects of a second language will vary according to the age at which learners acquired that language (see Newport, 1994), does not account for the individual variability among the 4 ESL participants. Age of acquisition alone cannot explain why Ben, who was the only ESL participant to be introduced to English as an adult, speaks English more fluently than the others, who were taught English as children. Maybe Eliza's, Pucca's, and Ali's early lessons in English were too theoretical to trigger natural language acquisition as full immersion would. Thus all four ESL participants should be categorized adult learners, since all are currently young adults in their 20s or 30s, who typically "[show] huge variability unrelated to their age of arrival" (Pinker, 1994, p. 296). For them, learning style, method of acquisition, and current priorities seem to play a more important role, as shown in the following table (see Table 4).

Table 3:

Individual Values and Priorities

Name	Grammatical accuracy	Clear meaning	Attractive style
Ben	Notices grammatical constructions when reading (e.g. prepositional phrases acting as modifiers) but does not proofread own writing.	Revision strategy is to add more supporting information.	Frustrated by lack of vocabulary, admires "smoothness" of "logical flow" in sentences.
Eliza	When first speaking English, worried about grammatical accuracy; now does not think of it while speaking (still does while writing, worrying about tense, spelling, and combining strategies). Revises by proofreading for these technical errors.	Able to concentrate on meaning only when speaking, but not when writing.	Believes sentence variety and complexity improve writing. Long sentences are more interesting and convey more meaning.
Mike	Not consciously aware of grammar when writing but may think about spelling and avoiding comma splices. Will proofread for omitted words or to correct punctuation.	Prefers Canadian schools because students are encouraged to offer their own opinions. When writing, most concerned with making meaning clear.	Avoids repetitive words. Believes good writers express their ideas in as few words as possible.
Pucca	Often thinks of grammar rules when writing, especially verb tense. With time to revise will proofread for tense and spelling errors.	"Need to know" approach to vocabulary and grammar. Looks up what she needs to get overall meaning. When writing worries that she does not know the words to express her ideas.	Concerned with avoiding repeated words (strongly dislikes doing this) and using a variety of sentence patterns (less of a concern). When revising, may try to make sentences more complex.

(table continued)

Name	Grammatical accuracy	Clear meaning	Attractive style
Ali	Finds grammar rules easy to learn. Believes learning grammar is important, but when solving SC did not think of any grammar rules or terms. Will focus on grammar more when writing essays.	Worrying about perfect grammar distracts him when he is writing and makes it more difficult to concentrate on meaning. If he thinks about grammar while talking, he loses his train of thought. When revising an essay, cannot add ideas ("makes me nervous").	Does not worry about style.

Table 4:

ESL Experience

Name	Age/context	Pros and cons of ESL experience
Ben	23 (LINC in Vancouver)	Easily learned grammar rules, but cannot apply them well. Worked out word families on his own. Reads fairly comfortably. Strongly aware of morphology. Good pronunciation. Thinks in English while working with computers.
Eliza	8-9 (Grade 4, Romania)	Strong knowledge of grammar; weak spoken English. Good reader. Early emphasis on translation rather than thinking in English a problem later. Only recently able to think in English.
Pucca	10-11 (Chinese school)	Early emphasis was on alphabet, complex grammatical rules. Still tendency to use memorization as a learning strategy. Comfortable with basic syntactic structures (simple sentence). Cannot think in English unless compelled by an activity such as sentence combining.
Ali	7 (Iranian school)	Strongest in grammar and writing, weaker oral communications. Somewhat aware of morphology. Difficulty with comprehension of complex syntactic structures. Can think in English at the level of simple sentences only.

Reflections on Think-Aloud

Think-Aloud Utterances and Their Relationship to Thinking

The use of think-aloud utterances as a reflection of participant thought processes as they combined the sentences was inevitably imperfect but nonetheless provided some interesting insights, some of which are discussed above. Although my experience in transcribing both my own and participant tapes (see Appendix D) confirmed that "verbal reports" must be simultaneous with thought to accurately reproduce the exact words of "inner speech" in STM, the posttest interview was soon enough to offer extremely helpful feedback or triangulation on the essence of what the participants had been thinking. In this sense, the posttest interviews provided information as valuable as the think-aloud did because, as a number of sources confirm, inner speech represents only one facet of actual thought.

Chomsky (1975) writes that "it may well be impossible to distinguish sharply between linguistic and non-linguistic components of knowledge" (p. 43). Anderson (1993) divides stored knowledge in our memories between declarative or "factual knowledge that people can report or describe", and is therefore conscious (when it enters working memory), and "procedural knowledge," which is unconscious or innate. However, he points out that "there are instances of declarative knowledge that cannot be verbally communicated" (pp. 18-19). Some of our knowledge, for example, is manipulated in our minds as visual images. When I chose sentence combining as a suitable task for Level I verbalization (Ericsson & Simon, 1980), I had not realized that even such a language based exercise might trigger nonverbal thinking, but it did for me, and at least two of the participants. Ali, for example, pictured a hamburger, fries, and milkshake sitting together on a table as he combined the three kernel sentences in the second group into a list. Like me, Pucca claimed to "see words move and

appear" as she linked them in her mind. Although Eliza, also a visual learner, felt she could visualize words only in her L1, Pan and Berko Gleason (2001) make it clear that this is not a universal ability but varies, probably with learning style: "Even though it is true that many people are able to visualize words, not everyone does so" (p. 127). Furthermore, an L2 reader may create an erroneous mental picture of a word, as Ben did when he imagined Wagner at a modern dance party after reading the word "rave." Think-aloud was not able to reveal thoughts of this sort, even though they would significantly influence the participants' understanding of a passage. Such nonverbal thoughts may also have been occupying the participants' working memory during some of the periods of silence when they did not speak. It is fortunate that some participants were able to discuss their nonverbal thinking during the exit interview. Those concerned with the efficacy of think-aloud methods should perhaps research this problem further.

Equally intriguing is the failure of any of the participants to think-aloud extensively in their L1. It is certainly possible that, as Ben speculated, the presence of a unilingual English-speaking interviewer inhibited some participants' natural L1 thought processes, but there is also evidence that the participants' intermittent and mainly lexical use of L1 thought was dictated by the form of the sentence combining exercises themselves. Eliza claimed to have recently learned to think in English when performing English language tasks, so her use of English to combine sentences was, no doubt, natural. Ali also felt himself able to think in English when manipulating shorter, simpler word groups such as the kernel sentences. It is interesting that when he first scanned the paragraph on Wagner he had to work out an overall idea of the story in Persian before switching in English to synthesize the actual sentences, yet this L1 analysis was not reflected in his think-aloud utterances. Was it due to inhibition, or

was he building a concept using largely nonverbal thoughts? Most important, Pucca, whose ability to think in English was perhaps least advanced of all the participants, described her early difficulties with sentence combining in my EAC 150 class as follows: "I can't use Chinese to translate to English for combining sentence. I can't. They are different." Pucca was not able to explain this difference at the time of the interview, but I can speculate that Pucca was able to "mediate" between L1 and L2 only at the lexical level. She could not interpret meaning derived from syntax by comparing it to the very different syntax of Chinese and could only manipulate the syntax of the kernel sentences provided using her grasp of the syntax of the simple English sentence together with a few memorized combining strategies. It is not clear if think-aloud activities would help students like Pucca to think syntactically in English, but it is very likely that an extensive course of sentence combining would, since she could not use interlanguage translation. Further research might confirm this.

A Comparison to K.E. Johnson (1992)

Since K.E. Johnson's (1992) study, "Cognitive Strategies and Second Language Writers: A Re-evaluation of Sentence Combining," also analyzed sentence combining through think-aloud, it may be valuable to interpret my participants' experiences according to her criteria. K.E. Johnson categorized each of her subjects' utterances as one of 10 possible cognitive strategies (see Table 5).

These results are tabulated in Table 6, with 5 and 6 summarized separately. Note that a participant may use one of these strategies without articulating it. For example, Eliza's articulations mainly centred on "cohesive devices," but she nonetheless must have decided to eliminate redundant words (since she did) without talking about it specifically, perhaps because it had become a virtually automatic step in the process.

Table 5

Ten Types of Cognitive Strategies
(see K.E. Johnson, 1992, p. 65)

Strategy	Example
1. Lower Level Questions (about the task)	Rules of the exercise. e.g. "Can I change the order?"
2. Higher Level Questions (about ideas)	Content questions: e.g. "What does this idea refer to?"
3. Lower Level Planning (local)	e.g. avoiding repetitions, changes within a kernel sentence
4. Higher Level Planning (global)	e.g. metacognitive discussion, changes based on main idea
5. Restating Content 1 (reading the text)	Reading the passage as it appears, for example
6. Restating Content 2 (reading/writing own text)	Reading the participants' own combined sentences
7. Constructing Meaning 1 (ideas directly related to text)	e.g. noticing related ideas within the sentence groups
8. Constructing Meaning 2 (new ideas or meaning)	eg. showing new ideas (by adding words /changing order?)
9. Constructing Cohesion (cohesive devices)	Discussing use of conjunctions, punctuation marks, etc.
10. Evaluation (judging appropriateness)	Judging what is written, e.g. what "sounds better", or what seems not right

With regards to K.E. Johnson's (1999) fifth and sixth categories, "Restating Content," my participants reacted similarly. All participants read through the sentence groups for initial, general comprehension and then reread one or two kernel sentences if they were having trouble with a more specific understanding. During this initial reading, the participants (most markedly Pucca) would also be scanning for unfamiliar words or idioms. Since intonation varied as different students read (or reread) sentence groups, it is likely that they were looking at the relationships of ideas as they might fit into a larger sentence, therefore constructing meaning at the same time. All participants read their own writing for two reasons. The first and most productive was to test and experiment with various combinations of words and ideas. This certainly overlaps with evaluation. At the end, they all read through as a final "proofread", but after this there were no significant changes, only occasionally adding omitted words or correcting spelling.

All students used evaluative thinking, accepting or rejecting specific word groups or whole sentences/paragraphs. This did not necessarily draw on metalinguistic understanding, but more their instinct of what "sounded" right. Eliza, Mike, Pucca, and Ali all sensed weaknesses in specific sentences but were unable to quickly identify or correct the problem.

To summarize, then, whatever their think-aloud utterances, all students used all strategies to some degree. Eliza and Ali seemed most comfortable with sentence-combining rules and did not ask any task-related questions. Eliza, Mike, and Ali did not explicitly "construct meaning" at the lower level, but lack of utterances at this level probably reflects automaticity, not inability. Pucca tended to "construct meaning" for two kernel sentences at a time and did not note the main idea of the whole, combined sentence group. All students

Table 6

Analysis According to K.E. Johnson's (1992) Cognitive Strategies
(for meanings of abbreviations, see Table 5)

Strategy	Ben	Eliza	Mike	Pucca	Ali
LLQ	What does "whole discourse" mean?		Should I change words? Should I join all 3 groups together?	Can I make this into 2 sentences? Can I use the same word twice?	
HLQ	Several questions re pronunciation. Meaning of *culprit*. Which was *daily average*?	Implied questions from tone of voice: Pronunciation of *suicidal*; meaning of *going to the East*	Do we have to say he's an expert?	Can I use *by* to combine two ideas?	Checking meaning of *stability* and *suicidal.*
LLP	I can "add commas and all of that."		Omit *humid.*	Identifying unfamiliar words (e.g., *humid*).	Finding redundant words to omit.
HLP	Let one phrase (*of fat*) modify three ideas.		Put *saturated* at beginning, leave out the rest.	Omit redundant phrase.	Relating *increased* to *health conscious*. Which quantity of fat is in *single meal*?
CM1	Identifying main point (central kernel), relationship between two ideas (*gloom/suicidal*).			Look for kernels with similar ideas to join.	
CM2	Summarize overall meaning. Digressions on meaning of perfect tense, indefinite article.	Reading sentence group with intonation as a single sentence.	The strange ones are often the geniuses.		Discusses "subject" of sentence group. Main idea of paragraph worked out in L1.
CC	Decide not to add joining words. Using semicolon; *because*.	*Because* vs. because of (datorită); semicolon; *which* (several times); *as a fact.*	*Such as; each... respectively; but, who, and.*	*Because, although... For example* more appropriate than *such as* to introduce clause.	Adds conjunctions, usually *and.* Uses *include* to embed list.
EVAL.	First sentence "seemed too long." Another had "too many *and*s."	*During* is better than *in*. *Such as* or *for example.* Dissatisfied with last paragraph.	Which way "sounded good" (i.e. simpler). "I should have started somewhere else."	Using *because* twice "looks ugly." "I don't think that's good."	"I think it is not perfect." "The first sentence has problems."

referred to cohesive devices with some specificity, even if only by slightly stressing a joining word as they restated the content. However, they used many cohesive devices that they did not refer to explicitly at all. This confirms my original suspicion that identifying one specific strategy with a single think-aloud utterance oversimplifies the participants' thought processes.

In spite of this possible weakness in analysis, many of K.E. Johnson's (1992) conclusions do accord with my own. For example, she found that sentence combining required L2 writers to "think through content, formulate ideas in their own words, and plan their sentence constructions according to local and global discourse constraints" (p. 70). Because of this, she also concluded that sentence combining mimicked the natural writing process in many ways:

> It may be that the way writers think through content as they form, refine, and elaborate their ideas during authentic writing tasks is similar to the cognitive strategies they engage in during sentence-combining tasks [so that]…sentence-combining tasks and authentic writing [may] place similar cognitive demands on writers and might in fact be more alike than has been previously believed (p. 70).

Finally, like me, and confirming also Van Patten's (1989) results, she found that students concentrated on content rather than form: "The results of this study indicated that sentence-combining tasks did not require these second language writers to attend to cohesive devices. Instead, they focused on understanding the meaning of the text and planned how to express that meaning" (p. 71). In the end, however, because K.E. Johnson focused on similarities–the strategies employed by the largest number of subjects–while I opened my interpretation to individual variations, I was able to learn more from the differences between my participants'

experiences. Thus I am able to endorse my original suggestion that think-aloud may be effectively interpreted through a qualitative lens.

Reflections on Method and Methodology

The flexibility of comparative, qualitative case study as a methodology has been very beneficial in this study, allowing data on the participants to be discussed both individually and collectively. Fortunately, my call for volunteers brought me 5 participants from an interesting range of language backgrounds, including a native speaker of English, whom some might see as a valuable "control" figure. It would have also been instructive to have had an older adult in the group, so that differences over the range of adult development might have been reflected. However, even if I had had participants with more similar backgrounds, I would still have encountered equally thought-provoking differences in their language processes, learning styles, and individual writing preferences.

My choice of exercise was possibly more problematic. My own "pretesting" of the sentence combining activities helped me to create an appropriately challenging level of syntactic difficulty for the majority of the participants, but I underestimated the comprehension difficulties some participants would face with the paragraph about Richard Wagner because of cultural references that only the European, Eliza, could completely understand.

My approach to the interviews, particularly the background questions and "exit interview," meant that much of the interview resembled an unplanned conversation rather than a structured monologue. This approach made it possible for our conversation to digress and thus uncover critical information that I might have otherwise missed, such as a discussion of participants' nonverbal thinking and aesthetic preferences. I was also able to use the

follow-up interviews to build greater consistency on some points that had arisen during the transcribing and summarizing stages. Nonetheless, writing this chapter as mueh as 3 months after some interviews, I find that there is much scope for further discussion of the process, if it were still practical after such a long space of time. Ideally, in think-aloud studies, researchers should try to schedule not one but two postanalysis interviews as soon as possible after the initial session, while participants might still be able to recall their mental processes in some detail.

It is harder to determine whether I was able to meet the requirements of "reciprocity" in the interviews. I was able to give a "voice" to students, who traditionally have little say in their curriculum, and may have been able to reassure some of my participants that their problems and frustrations with English were shared by many others and are a natural part of language acquisition and development. However, it may not always have been comfortable for them to see these problems highlighted and discussed in writing. Based on their reactions as they read my interview summaries, I suspect that the detailed and focused examination of their words and actions required by the "thick description" was flattering to some participants but overwhelming to others. Were my participants in truth coresearchers? I did indeed benefit from their experiences and opinions, which suggested many possibilities for further study. I also attempted to discuss my findings with them. While interested in the way language development theory reflected on their individual experiences, for example in building vocabulary, none of them wanted to discuss the larger questions behind the study. I am afraid that, perhaps because I had once been their teacher or perhaps because of their relative youth (all were somewhat younger than I) and/or weaker knowledge of English, the status of equality between us was not as strong as I had hoped for. My invitation to them to offer their

opinions freely was not enough to overcome their feeling of "silencing or disempowerment" (Merriam & Caffarella, 1999, p. 147) as students and, perhaps, as outsiders in this country. Also, some of them may have felt it too difficult to articulate their own ideas in spoken English. In the end, while my participants contributed much of value both voluntarily and in response to my questions, it was inevitable that I should have kept overall control of the interviews and of the goals of the study. In future research of this sort, ideal participants as co-researchers might be selected from individuals who are also working at a graduate level, so that they may better appreciate the theoretical implications of the research. Most important, they should not be students in an institution where the researcher is a teacher or in any other situation with marked power inequality.

Conclusions

In this chapter, I have tried to interpret the revelations from my participants' think-aloud activities in light of a number of theoretical and practical concerns. These include the nature of the writing process, constructivist learning, the conflict between meaning and form, and the role of higher level thinking in sentence combining. These interpretations have implications for the relative benefits to the classroom teacher of traditional grammar, sentence combining, and whole language activities. To explore the variability in student responses to sentence combining or other writing tasks, I have also examined the participants' individual differences according to their syntactical and lexical strengths and weaknesses, their possible learning styles, their personal preferences, and their age of second language acquisition. In another section, I discuss what this study has revealed about the efficacy of think-aloud techniques in revealing thought, with special emphasis on the problem of representing nonverbal thinking. While I confirm that qualitative interpretation is highly appropriate for

examination of verbal reports, there are some reservations that should be borne in mind in future studies of this kind. Nonetheless, this study has introduced a number of suggestions for classroom practice and questions for future research, shown in the next chapter.

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

The Theory of Thought and Language

This study has shed some light on the general questions about language and thinking outlined in its introduction, but it has also generated additional, specific questions that require further exploration. Central to any understanding of the relationship between thought and language is the role words and sentences play in representing thought. As Chomsky (1993) explained it, "language cannot exist independently to human thoughts" although those thoughts also involve "computational processes… that are quite inaccessible to consciousness" (pp. 24-25). In other words, language is dependent on thought, but thought is not necessarily dependent on language. Because the majority of our thought processes are unconscious and many more are nonverbal, there are limitations to the range of thinking that even the most eloquent native speaker of a language can articulate. It is not surprising, then, those whose first language is less well developed, and even more those who are struggling to express themselves in a second language, can be so challenged by the difficulties of putting their thoughts into words and sentences that their teachers may assume that they lack capability, not only in language but in thinking as well.

This study has gone some way in showing that in most cases such assumptions are unjustified. Adults who are able to read and write English at anything approaching college level must successfully be employing higher level thinking in many ways. And this capacity for higher level thinking plays an important role in their growing mastery of their adult language, whether it be foreign or their native tongue. Effective adult language learners must move beyond the lower level, "habit learning" processes that build their mental lexicons to master the higher level, "associative" demands of complex syntactical analysis and synthesis.

This need for higher level thinking is greater for adults than for children precisely because their innate grammatical abilities are in decline. Thus, adults, using more conscious cognitive processes and higher level thinking, will take longer to acquire second language forms than children, who can draw on unconscious language faculties and "habit learning." In other words, "the adults who succeed at grammar often depend on the conscious exercise of their considerable intellects, unlike children, to whom language acquisition just happens" (Pinker, 1994, p. 296). The good news is that over time, although adult second language learners may never achieve native-like fluency and pronunciation, they can hope to appreciate increasingly subtle shades of meaning found in the forms of morphology, phrase structure, complex sentence structures and prose styles, as well as in the core meanings of words. Joseph Conrad, for example, retained a thick Polish accent but read and wrote English at a level of sophistication beyond that of most English-born contemporaries (Pinker). The Critical Period Hypothesis notwithstanding, language development (as opposed to acquisition) in most people is part of a lifelong natural continuum, so that many adults refine their language ability up to and beyond middle age (Obler, 2001).

These language capabilities of adults warrant further study. Although the Critical Period Hypothesis predicts that individuals who are not immersed in a second language until adulthood will never fully master its morphology and syntax (Newport, 1994; Pinker, 1994), language teachers have seen that most adults can achieve communicative competence in a second language without direct "rule" teaching or drill (see for example Ioup, Boustaghi, El Tigi & Mosell, 1994; Schmidt, 1983). Little is understood about the role innateness plays in the language development of learners who are past puberty, but J. Johnson and Newport (1989) found that "some rules of English grammar were more profoundly affected by age of

acquisition than others" (p. 92), suggesting that after puberty the falling off in innate language skills is neither complete nor universal. Nonetheless, conscious awareness of the nature of language and motivation to understand its meaning are both critical. One fascinating proof of this comes from the experience of Kanzi the bonobo, the only ape to learn a human (symbolic) language spontaneously through social communication, as children do. When very young, Kanzi watched researchers attempting to instill language in his mother, Matata, through the method usually applied with apes–endless drill. Matata did not learn language, but Kanzi, with no direct teaching, seemed to grasp the symbolic nature of language and from that point learn rapidly and naturally through his desire to communicate with his handlers. They concluded that "Kanzi's language acquisition seemed to announce dramatically that language acquisition was first and foremost a feat of understanding" (Savage-Rumbaugh & Lewin, 1994, p. 136)–that is, of associating meaning with forms. Likewise, adults who have mastered the interplay of words and rules through their first language are able to apply to their second language some of the crucial benefits of our innate language faculty, which seem to include both our grasp of the symbolic nature of language and our compulsion to communicate and understand others' communications.

Van Patten's (1989) studies in the conflict between content and form also provide evidence that learners naturally struggle towards meaning in anything they hear or read. The two think-aloud examinations of sentence combining, both K.E. Johnson's (1992) and this study, corroborate this observation. This struggle for understanding must encourage learners to deepen their understanding, conscious and unconscious, of the words and rules that create the target language. Thus, as long as ESL students are not forced to process language tasks

that are too far beyond their current level of linguistic understanding, they should naturally and successfully use higher level thinking to develop their language skills.

The Practice of Teaching Language

While awareness of conscious and unconscious cognitive processes is critical to understanding second language acquisition, this discussion of the role of higher level thinking is of most concern to teachers when it is related to the role of formal instruction in directing that thinking. It is agreed that children do not need organized, formal instruction to acquire oral language. However, "a whole industry is built on the consensus that instruction matters to foreign language learning" (Bley-Vroman, 1990, p. 11). Is our insistence on explicit teaching of the rules of language mistaken? Bley-Vroman distinguished between the metalinguistic "learning about the language," that is learning its formal "rules," from true language learning, or what Krashen (1981, cited by Schmidt, 1983) called acquisition. Bley-Vroman also maintained that adult language learning (or acquisition) "resembles general adult learning" or "problem solving" (pp. 11, 44), which tends not to be institutional. In fact, according to Allen Tough (1979), 80 % of adult learning is self-guided, and Tough, whose theory of adult self-directed learning sprang from his own experience learning French for his Ph.D. as well as empirical studies of adult students, said, "My impression …is that people are highly competent at planning their own learning and highly successful at it" (p. 7). Perhaps the language learning tools that the adults themselves recommend are the ones teachers also will find most effective.

The participants in this study confirm what the whole language movement has maintained over recent decades: Open-ended reading, writing, and oral communications tasks on topics of interest to and as far as possible chosen by the students provide the best and most

natural context for them to develop their language skills. That said, when language tasks are large and general, it can be easy for learners to overlook the specific meanings conveyed in the words and forms of sentences–the basic building blocks of language. This study has helped to confirm that occasional sessions of sentence combining exercises can help to fine-tune the developing language skills of both second language learners and native speakers for a number of reasons. Open solutions to "whole discourse" problems allow students to apply their own stylistic values even if the kernel sentences are supplied, while their puzzle-like nature helps to maintain students' motivation and the desire to find meaning. In particular, the division of that meaning into easily grasped "chunks" can help second language learners to move beyond general lexically based understanding to a greater focus on forms, especially those dictated by syntax.

This aspect of sentence combining, pointed out by Ali, as well as the question of personal voice explored in the previous chapter, is also related to a passage one of my students wrote last term in an essay responding to an article by the Chinese-American author, Amy Tan (2002). In "Mother Tongue" Tan described the different versions of English she used in her work and with her mother.

> Recently, I was made keenly aware of the different Englishes I do use. I was giving a talk to a large group of people, the same talk I had already given to half a dozen other groups. The nature of the talk was about my writing, my life, and my book, *The Joy Luck Club*. The talk was going along well enough, until I remembered one major difference that made the whole talk sound wrong. My mother was in the room. And it was perhaps the first time she had heard me give a lengthy speech, using the kind of English I have never used

> with her. I was saying things like, "The intersection of memory upon imagination" and "There is an aspect of my fiction that relates to thus-and-thus"–a speech filled with carefully wrought grammatical phrases, burdened, it suddenly seemed to me, with nominalized forms, past perfect tenses, conditional phrases, all the forms of standard English that I had learned in school and through books, the forms of English I did not use at home with my mother. (p. 231)

The student, also Chinese, wrote this (which I have somewhat altered to make the syntax more idiomatic):

> My English [has taken] shape from my family's language, and this is what [how?] I sometimes communicate with others. Imagine the millions [of] families like Amy's and mine; how much impact would [they have on] society? Nowadays, short and simple sentences are commonly used, which most ESL speakers are comfortable with. In comparison, these short sentences [in] non-structured language are easily understood [by] non-native speakers. Though not [for] everyone,…to my family at least, this language [is] the most effective way of communicating.

What does this point of view mean to the teacher of sentence combining or other exercises designed to promote generation of more complex sentences? One belief supported by this study is that sentence combining is a benign way to encourage ESL students to build on their familiar simple sentences and increase their ability to both understand and produce "sophisticated" forms in their writing. It may even, because of its focus on syntax, extend their ability to "think" in English. But teachers should also consider whether the overly long

constructions produced by sentence combining are good models for writing in the 21st century. How far should we try to mold our students' personal voice in writing? Forty years ago the literary community and composition teachers like Christensen (1967), Mellon (1969), and Strong (1985) were satisfied that sentences that embedded layers of meaning through "free modifiers," as favoured by early 20th century writers like Hemingway and Faulkner, were preferable to the more rigidly structured sentences used by earlier authors like Henry James. Maybe today we should allow our students to emulate the more vivid and direct writing of multicultural authors, like Tan, who grew up in families speaking an even more simplified English. After all, as Tan's mother concluded of *The Joy Luck Club*, "so easy to read" (Tan, 2002, p. 235).

Thus, while sentence combining can benefit students with a wide range of language backgrounds, cognitive approaches, and learning styles, it should be used with caution and not at the expense of more natural and self-directed language tasks. To quote Tough (1979) again, adult learners "felt more successful about their own planned learning situations because they were only learning what they were interested in" (p. 7). If, as is suggested above, the desire to understand is the prime motivator of language acquisition, it makes sense to allow students to choose topics where that motivation is strongest. Language teachers need to allow a greater degree of naturalism, flexibility, and student self-direction into their classrooms to give their adult students, with their varying aptitudes, motivations and learning styles, a wider range of opportunities, both conscious and unconscious, to develop their second language proficiency.

Recommendations for Further Research

Although this study, benefiting from a narrative/descriptive and qualitative approach, has suggested a few new answers to a number of theoretical and practical questions, further

research is necessary to confirm or disprove its tentative conclusions. One theory which deserves to be questioned at greater length is that of the Critical Period Hypothesis. It would be interesting to get a clearer picture of the range of differences in lexical versus syntactic aptitude and to determine how far some adult learners' superior capacity for higher level, "associative" thinking and consequent grasp of syntactic meaning can compensate for their more limited lexical and phonological skills. Further study may also illuminate the implications to educational theory of the wide range of our students' aesthetic values and communicative priorities. Future researchers may look for methods that help participants in think-aloud studies to externalize their nonverbal thoughts, thus creating a more thorough and accurate picture of their cognitive processes. Most of all, language teachers may want to test the benefits of that discredited exercise, sentence combining, in helping second language learners to grasp meaning conveyed by complex linguistic forms or even to achieve a more sophisticated ability to "think" in their second language. In the end, though, before advocating a revival of the sentence combining "craze" of the '70s, we need to look at the way language is evolving around us–and allow our adult learners to develop their language skills in their own distinctive voices.

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Appendix A

Sentence Combining Exercise for Think-Aloud

1. Whole Discourse Open Sentence Groups (progressive difficulty)

- Many Canadians have become health conscious.
- Their consciousness has increased.
- This is thanks to scientific studies.
- The studies were well publicized.
- Many Canadians still die each year.
- They die from heart attacks.
- They die from strokes.

- Saturated fats are the main culprit.
- Fast foods are a big source of such fats.
- These include hamburgers.
- These include French fries.
- These include milkshakes.
- A fast food hamburger has over 30 grams of fat.
- The fries have 11 grams of fat.
- The shake has 9 grams of fat.

- The total does not make for ideal nutrition.
- The total is over 50 grams of fat.
- This is in a single meal.
- One expert recommends 10 to 20 grams of fat.
- The expert is Dr. Glen Griffin.
- This is a daily average.
- The daily average is healthy.
- We still get 42 percent of our calories from fat.
- This is four times the body's requirements.

Adapted from Strong (1990) p. 15-17

2. Paragraph Consolidation (maximum 3 sentences)

Richard Wagner had the emotional stability of a six-year-old. He felt out of sorts. He would rave. He would stamp. He would sink into a gloom. The gloom was suicidal. He would talk. His talking was dark. His talking was of going to the East. It was to end his days as a Buddhist monk. It was ten minutes later. Something pleased him. He would jump up and down on the sofa. He would stand on his head.

Adapted from Deems Taylor, "The Monster" from Washburn University Writing Center (1993) www.washburn.edu/services/zzcwwctr/sent-combine.txt

Appendix B

TEACHING JOURNAL

Testing Think-Aloud In The Classroom
Wednesday, March 13, 2002

I first explained the concept of think-aloud (that it helps you with your reading, writing and thinking), and explained it by giving the example from John Lochhead's (2000) "Sound Thinking with Thinkback 2000". I projected the following problem, reading it aloud and giving the students a minute or so to work it out in their heads.

Two people work together. One is the "problem solver" (thinker); the other is the "listener" (questioner).

Sample Problem

If the second letter in the word *WEST* comes after the fourth letter in the alphabet, circle the letter A. below. If it does not, circle the B.

A B

I read out the dialogue (Lochhead p. 7-9), pointing out that the "problem solver" had jumped ahead to the answer without explaining the steps he had followed. I asked how many had used the same reasoning as the "problem solver" and most admitted they had. I then explained that think-aloud can be used for reading and writing essays, but I thought it would work better for a shorter "problem" such as sentence combining. I moved to the following screen. I explained that I had not done the group before (true for the first class) and that to give me something to think-aloud about I needed to do something challenging for me (hence nine sentences into one on a scientific topic).

SENTENCE COMBINING THINK-ALOUD

Teacher is "Problem Solver", class is "listener".

- Sound must have some material to pass through.
- It cannot travel through a vacuum.
- Sound can travel through a variety of materials.
- It travels at different speeds through different mediums.
- Sound travels through dry air at about 700 miles an hour.
- This is about the speed of a bullet fired from a rifle.
- Sound goes about 2800 miles an hour through water.
- It moves faster than this through the ground.
- It travels faster through solids and liquids.

I asked the class to prompt me if I didn't explain where I got an idea. As I spoke, I typed my combined sentences on screen. Here is my solution to the problem (in italics), with my spoken "thinking" (as well as I can remember it) explained in detail.

I first read the first six sentences, and then I commented that the first part seemed to be about what materials sound can pass through and the second part about the effect on speed. So I decided to combine the first part first. I decided to try and combine sentences 1 and 3, so I started with 2, turning it into a "fragment" (the student's wouldn't know the official grammatical terms):

Unable to travel through a vacuum, sound must have one of a variety of materials to pass through,

I explained that the next idea could simply be added on with "and":

...and it travels at different speeds through different mediums...

I then stated that the next part had examples of different mediums and speeds, so I would use the transition "for example" with a semicolon to avoid a run-on sentence:

...; for example, it travels through dry air at about 700 mph...

I used a "which" clause to join the next bit without adding extra words:

...which is about the speed of a bullet fired from a rifle...

When I read the next sentence aloud, I commented that I had not realized that sound traveled so much faster through water than through air. I noted that that was probably why dolphins used sound instead of sight to orient themselves, as they lived in water. Because this fact was surprising to me, I would use a joining word that indicated contrast:

..., but at about 2800 mph through water and even faster through ground, ...

For the last sentence, I said that it seemed to summarize the previous idea. I didn't want to have any more semicolons (one per sentence is enough), so I would make this idea a fragment also.

..., traveling faster through solids than liquids.

Although I had talked pretty steadily, I had not explained EVERY choice I made, but no students asked questions as I wrote. This may have been because they were intimidated, or because I was working at a higher level than they were comfortable with, or merely that I went too fast. It is also possible that I was so focused on task that I did not seem to be inviting questions.

At the end, I asked the class to assess my accuracy and lack of repetition (I told them that I didn't think they would want to question my grammar). Had I made the ideas clear without changing the meaning? After all, they had studied science more recently than I had. A student in the first class suggested that I had repeated the word "traveling" too much, and I see that when I composed the sentences for the second class (the version given above), although I tried not to think of my previous answer, I automatically avoided this problem. For both classes, I pointed out that sentence combining required you to look over what you had written and think about it.

I then asked the students to find a partner. I handed out the sheet ("Life in Winter") and told them that they should alternate being "listener" and "problem solver" (the "Thinkback" technique). I explained that I would be listening just to find out what different methods students used to answer these questions, but that their mark would be based only on their written answers. The students could hand in separate sheets or hand in a joint group one with both names at the top. In one class with an odd number of students, there was one group of three. This is what I noted in informal observation of the groups working in the two classes.

Process

Most students began by reading the sentences aloud. They tended to stop whenever there was something they did not understand, or a change in meaning. They might repeat a sentence in a questioning voice until it seemed to make sense, but they did not usually explain what was going on in their minds as they repeated it. For the longer sentence groups, they often read three or four sentences and then joined those before going on to the end of the group.

The discussion revolved around a number of different aspects of the problem. There were questions relating to reading comprehension – what the individual sentences meant alone and in relation to each other ("is the life hidden or not?"). There were discussions of unfamiliar vocab (eg. "weed", "crawl", woodchuck") and of grammar and punctuation rules ("if I use 'when', do I need a semicolon?" "You need a comma here"). ESL students experimented with changes to the syntax to see which phrases"sounded" more idomatic ("full hidden life" or "full *of* hidden life").

Group Dynamics

There were several different ways this worked. In most cases, rather than formally switching back and forth, both students tended to "problem solve" in tandem. In some groups, one student was more comfortable vocalizing than the other and tended to dominate the conversation, while the other did the writing. The "problem solvers" tended to jump in their thought – make a decision without explaining it – and the "listener" usually failed to ask for verbal explanation but just wrote it down. I don't know if the "listener" did not question because of unfamiliarity with the technique or because their own unspoken thoughts were so similar. As teacher I prompted students to explain their reasons for an action a number of times (for example, I asked why one student had decided to put crickets, wasps and spiders in a list).

Some groups had difficulty coming to a consensus on the wording of a sentence. I had to adjudicate one dispute, suggesting that the "problem solver" was responsible for his particular questions, and that the two different models being disputed were probably equally likely to get the marks! I had often in the past pointed out that in sentence combining there were as many right answers as there were students in the class, and this experience bore me out as different students had strong feelings about how their thoughts should be expressed in words.

Logistics

Some students spoke very quietly so that it was hard for their partner, much less a researcher, to hear them. This was aggravated by the fact that four or five groups were talking at the same time. It would be impossible to tape think-alouds in regular class time.

Think-aloud seemed to slow the process of answering the questions. I noted that the group of three was significantly slower than the pairs, but this may have been due to some conflict between specific group members.

As teacher I tried not to give "answers", but I did have to help out from time to time explaining the rules of the exercise (you need to avoid repeating words unnecessarily) and define unfamiliar words (woodchuck, den).

Conclusions

The think-aloud component slowed down but also enriched the sentence-combining activity. Students told me that they found it hard. It may also have been constraining that all groups, even those who shared a common L1, voiced their thoughts in English.

If transcribing, I would have had to make a lot of inferences about what students were actually thinking. For example, students would suggest adding specific transition words ("we need a 'but' here" or "we should start this part with 'such as'") without articulating the relationship those words represented (contrast or introduction of examples).

In spite of these problems, the experiment really showed me the complexity of sentence combining exercises and the wide range of skills it requires. Even highly fluent, native speaking students were challenged by it. They were all engaged, and may even have experienced "flow". This study reinforced my belief that sentence combining is a constructivist activity, and that it incorporates a lot of the steps in the writing process – planning, sentence forming and reviewing. It also proved that even grammar exercises test a student's reading comprehension skills and may build her vocabulary and familiarity with English idioms.

Since many of my students are ESL and are probably thinking partly in English and partly in their L1, it would be interesting to inquire whether being compelled to think-aloud in English promotes their ability to think in English – a necessary step towards fluency.

Appendix C

Draft Email to Recruit Volunteers for Participation

Hi Former Student!

Would you like to have some input into the way we teach grammar to new students here at Seneca? I am looking for students of any background and ability level in English to help me evaluate a certain type of grammar exercise: sentence combining. Since you have been in my class, you are familiar with this type of exercise. Whether you enjoyed sentence combining, or found it a waste of time, I am interested in hearing your thoughts in greater detail.

In fact, you will be a co-researcher for my research into the relationship between language and thinking. Your thoughts and ideas about learning to write better may be extremely valuable, not just for me but for the education community in general. If you are interested in linguistics, psychology or education, you will find this study worthwhile.

Participation will take two or three hours of your time. We will need to meet for a tape-recorded interview of about an hour, at a time convenient to you. I will ask you some questions about your background (language and education), and your feelings about grammar and other methods of learning English. I will ask you to do a few sentence combining problems of intermediate difficulty, while you think-aloud, speaking your thoughts as you work on the sentences. I may also need you to help me interpret the tape recording, especially if some of your thoughts were not in English. There will also need to be a follow up meeting, so that you can read how I have written up your interview, and make any additions or changes you wish. This second meeting will be brief and informal, with no tape. There can be no payment, but I will provide refreshments.

Research ethics require that you sign a letter giving your "informed consent" to being interviewed, since your contribution will be part of a published thesis for a Masters of Education degree at Brock University. However, you will be given a pseudonym, so your information will be confidential. If you have any concerns about the study, you may withdraw at any time.

Please reply to this email if you are interested in participating or if you have any questions. I hope I may have a chance to work with you.

Liz

Appendix D

Sentence Combining Introspective Practice: May 31, 2002

In order to "test drive" the new exercises I had chosen, as well as to get a feel for the difficulties I may encounter in transcribing and interpreting the think-aloud protocol, I solved the four sentence combining "problems" while speaking aloud into a tape recorder; then I transcribed the tape as follows:

Transcription

Group One

Many Canadians have become health conscious/their consciousness has increased/ this is thanks to scientific studies/ the studies were well publicized/ many of us remain hooked on a diet/ the diet is fat-rich/the diet emphasizes fast foods.
(*read in a slow, matter of fact voice – slight pauses between each kernel sentence*)

I think I need to combine the first four items because the consciousness is in the first sentence (*pause*) and the thanks to scientific studies is connected to the next sentence. (*pause*) And then I need some sort of a contrast transition for the next part which can probably be all joined together.

Let's see what I can do here. (*spoke fairly slowly, with frequent brief pauses*)
Many Canadians have become (pause) health conscious – how about **increasingly** health conscious – thanks to (*pause*) well publicized (*pause*) scientific studies (*pause*) – **but** (*raised voice*) – many of us remain (*pause*) hooked – now, we'll put "fat rich" in as a modifier here – fat rich diet – need to hook on "emphasizes" – "which" would work better here – which emphasizes fast foods. (*pause*)

Many Canadians have become increasingly health conscious thanks to well-publicized scientific studies, but many of us remain hooked on fat rich diet – a fat rich diet – which emphasizes fast foods. (*reading quickly with sentence intonation*) Okay. It's a good thing that I read it over.

Time to Complete: Approx. 2.5 minutes

Group Two

Saturated fats are the main culprit – culprit of what? – fast foods are a big source of such fats – oh, it must be referring to the heart disease in the previous sentence. These include hamburgers/ these include French fries/ these include milkshakes (*these three spoken together quickly*) – a fast food hamburger has over 30 grams of fat/ the fries have 11 grams of fat/ the shake has 9 grams of fat (*also run together*) – so I'm going to have to take that second three and the third three and put them together and (*pause*) how do I get those first **two** groups together? – saturated fats are the main culprit, but it's the fast food – saturated fats **in** fast foods (*pause*) are a big source of the fats that are the main culprits. So let me see what I can do here.

Let's just try this as a rough: fast foods are a big source of the saturated fats (*pause*) – but that's not going to work, because then, when you get into the list of hamburgers and so on, it's not going to be next to what it is modifying.

So, I'll turn it around and say: the main culprit is – are? – no, culprit is – saturated fats of which – hate that; it's so formal – fast foods are a big source. Now, this is maybe a job for a full colon to introduce a list, in which I'll put: hamburgers have over 30 grams of fat, comma, French fries have 11 grams – and milkshakes have 9 grams of fat.

Let's look that over. The main culprit is saturated fats of which fast foods are a big source – maybe we'd better put "fast food hamburgers" just to make that clear – have over 30 grams of fat – maybe we'll use a transition – while French fries have 11 grams and milkshakes have 9 grams – of fat. Maybe we just need to say "of fat" the one time: hamburgers have over 30 grams, while French fries have 11 grams and milkshakes have 9 grams of fat. Okay, we'll leave it at that.

Time to Complete: Approx. 3.5 minutes

Group Three

The total does not make for ideal nutrition/ the total is over 50 grams of fat – so the total **of**. This is in a single meal – we'll just get rid of "this is". One expert recommends 10 to 20 grams of fat – obviously we need a transition to show contrast there. The expert is Dr. Glen Griffin – make that an appositive, perhaps. …daily average – "as a" – healthy daily average – just put it in there in front of "daily" – contrast again — we still get 42 percent of our calories from fat – and this is four times – we'll just make that a which.

Okay, I've already put in most of the connectors, but let's see if it all works together. The total does not make – ah, the total of over 50 grams of fat does not make for ideal nutrition – in a single meal – we'll put that after fat – "for" – let's use a more formal joiner – one expert, comma, Dr. Glen Griffin, comma, recommends a daily average – a **healthy** daily average of 10 to 20 (*pause*) grams of fat; semicolon, nevertheless, comma – we need something pretty strong to divide that already contrasting sentence from the further contrast – we still get 42 percent of our calories from fat, which is four times the body's requirement.

Read it over: The total of over 50 grams of fat in a single meal does not make for ideal nutrition, for one expert, Dr. Glen Griffen, recommends a healthy daily average of 10 to 20 grams of fat; nevertheless, we still get 42 percent of our calories from fat, which is four times the body's requirement. Yes that is a grammatical sentence. (*read fairly quickly with intonation*)

Time to Complete: Approx. 3.5 minutes

Paragraph

Here is the paragraph consolidation. Richard Wagner had the emotional stability of a six-year-old/ he felt out of sorts/ he would rave/ he would stamp/ he would sink into a gloom/ the

gloom was suicidal/ (*pause*) he would talk darkly of going to the East/ it was to end his days as a Buddhist monk/ (*pause*)it was ten minutes later/ something pleased him/ he would jump up and down on the sofa/ he would stand on his head. Obviously a big contrast here between sort of the manic-depressive or vice versa depressive-manic, so I need a big contrast transition in the middle. Uh, I've said a maximum of three sentences. I'm going to **try** and do it in two.

Obviously the first one's going to stay as it is as an introduction, but I could follow it by a colon to introduce: …the emotional stability of a six-year-old – not taking the time to write tidily here – (*pause*) – six-year-old; semicolon, **when** he felt out of sorts, he would rave, stamp and sink into a – yes, I've got to make that a "suicidal gloom" – talking, let's make that – fewer words – talking darkly of going to the East – to end his days – as a Buddhist monk. Period. Now I need a good transition; what can I use? "On the other hand"? No, that's too casual. "Amazingly"? Let's try that just for the moment. (*pause*) Ten minutes later – don't need the "it was" – if something pleased him, he would jump up and down on the sofa – on the sofa – and? Or? – we already have an "and", let's have an "or" – stand on his head.

Okay. This is a short paragraph and I've got it in **two** sentences. Richard Wagner had the emotional stability of a six-year-old; when he felt out of sorts, he would rave, stamp and sink into a suicidal gloom, talking darkly of going to the East to end his days as a Buddhist monk. Amazingly, ten minutes later, if something pleased him, he would jump up and down on the sofa or stand on his head. (*speaking rapidly with sentence intonation*)

Time to Complete: Approx. 2.5 minutes

Notes On Transcription Process

I was surprised how much of the transcription revolves around the actual words of the problem sentences. In this sense, having the printed question sheets and the written answers in front of me as I transcribe is helpful.

There is a great deal of variation in speed of speaking and intonation, so I have tried to indicate that as often as possible by notes in brackets. I have also indicated most of the lengthy pauses by (*pause*) and the shorter pauses with the double hyphen – but the reader needs to be aware that some of the pauses were for the physical act of writing the words instead of thinking. I expect everyone will think of what they want to write more rapidly than they can physically form the words on paper, so there will be pauses purely for that reason. I have also tried to differentiate between punctuation marks that are spoken, so consciously chosen, and those that appear in the written combined sentence but are glided over when the participant reads the sentence back. If the punctuation is spoken, I write it in as a word as well as putting it in as a symbol. Words that received particular emphasis, because they were at that moment the centre of thought, are highlighted in bold face.

It is interesting to note that, although I was transcribing my own words that I had spoken less than an hour earlier, I sometimes had difficulty understanding a word, having to play back the tape several times. Transcribing other people's words, especially when other languages might be involved, will be even more tricky. I may try to show foreign words phonetically (followed by the translation I was given), but phonemes of unfamiliar words are often hard to hear.

Notes On The Sentence Combining "Think-aloud Process"

After doing each group, I paused the tape and wrote down some quick notes on the think-aloud process. I notice that I explained my thought processes more as the exercise went on, and I think this reflected a greater comfort with the tape recorder as I grew used to it. I must note, at the start, that although I have never solved these sentence combining problems, or marked students' work solving them, when I selected the passages from Strong (1990) and an online writing site, combining some of his shorter word groups to create a more difficult exercise, I could not help thinking of their possibilities in a general way. In my reflections on the second group I refer to a previous sentence about heart disease. I had forgotten that I removed that sentence in order to keep the exercise short enough.

After I completed the first group of sentences, I wrote these notes:

- *Hard to articulate thoughts without using metalinguistic terms*
- *In my mind, chunks of words are moving around visually not aurally (maybe because I am a visual learner?)*
- *Had to remind myself to express more in words than just reading the sentences aloud as they evolve.*

These followed the second group:

- *This one was harder and needed more thought about logical order. I also started in one sequence, stopped, crossed out, and rearranged.*
- *Again, proofreading was important.*
- *Almost all steps of writing process!*

These followed the third group:

- *I am not very efficient at assembling the sentences in my mind – keep embedding info via arrows – even though students don't appear to do this in their written assignments.*
- *Perhaps the tape recorder has made me nervous, feel rushed.*

This is what I wrote after combining the paragraph:

- *Although condensing 12 sentences into 2 (average 6 per), this seemed much easier than earlier group.*
- *Maybe because order is clearer – narrative not expository?*
- *Gave more thought to style, less to logic.*

Since I completed all four groups in a total of 12 minutes, I was clearly working at a greater speed than my students would. I don't know if this was nervousness, ability or the speed at which I am used to scanning sentence combining work when I have to mark anywhere from 20 to 60 student papers. I hope that my participants, working more slowly, will also reveal more of their thought processes.

Even though I am reviewing my own think-aloud, I cannot explain all my thought processes. As I pointed out in the first set of notes, above, a lot of the patterning in my mind was visual

not aural. It was, however, verbal in the sense that it involved words and phrases (seen in my mind as groups of printed letters) not abstract ideas. I wonder if other visual learners think this way, or if I have learned to do it because of the enormous amount of reading and writing that I do, for work, school and pleasure (I solve cryptic crosswords).

Nonetheless, I was definitely using problem solving/higher level thinking skills when, for example, I worked out the logic of the second group, or when I chose the most stylistically suitable joining words for the paragraph. I was also using most steps of the writing process. I had to analyze the groups of sentences to see how they related to each other, sort them into related sub-groups that could be combined into clauses, and then decide on the relationship (such as contrast) between the clauses in order to choose an appropriate transition and/or conjunction. After I had written out the combined sentences, with in every case some stops to reconsider order or to reword, I read them again, listening to their sound as part of the editing process. In two cases I made changes to my wording at this stage. This process supports my "working hypothesis" that sentence combining helps students to become more comfortable with the editing stage of the writing process.

One factor I notice from the whole process outlined above was the importance of reading as a part of writing. I spent a lot of the time reading: first reading the kernel sentences as I explored their meaning, then reading each smaller section to assess my proposed method of combining, and finally reading my completed sentence to review its effectiveness. Reading aloud, I was also listening to "hear" if the sentence "sounded" right. This is why my re-reading of the completed sentence used carefully enunciated sentence intonation. If I were sentence combining silently, I would also try to "sound out" my sentences. I have tried this, and I can also do it in my head. Of course, I did not have any vocabulary problems, but I can anticipate that some ESL students will have trouble with words like "culprit" and concepts like talking "darkly".

As far as metalinguistic language is concerned, I plead a certain self-consciousness. If I were simply combining the sentences and not "thinking aloud" for the tape, terms like "appositive" might not have passed my mind. On the other hand, I was trying not to use overly technical terms because I would have to slow down and devote my STM to thinking what the proper term would be – and that would not be a natural response to the task. That is why I used the general term "transition", for example, whether I meant a coordinate conjunction (like "for"), a subordinate conjunction (like "while") or a conjunctive adverb (like "nevertheless"). This choice indicates that I was focusing more on *meaning* than on grammatical form. For me, analyzing the grammatical structure of a sentence is largely automatic. It will be interesting to see how much it is for my participants. I note also that my choice of punctuation – whether it be a colon to introduce a list, a semicolon to make a strong break between ideas, or even a comma to make a minor separation of sentence parts – was directed more at the meaning I was trying to construct than any concerns about grammatical accuracy.

ADDITIONAL NOTE: After doing this "test drive", I have made two adjustments to the assignment. I have changed the last three kernel sentences in Group One to make a smoother connection to Group Two. I have changed the sentence in the paragraph "He would talk darkly of going to the East" into three kernel sentences. This makes the paragraph more challenging.

Appendix E

Backgrounding Questions for Interview

Tell me a bit about your background.

1. What is your educational history?
2. What has been your feeling about school in general?
3. What has been your feeling about English as a subject?
4. What language was spoken in your home when you were growing up?

(If English is not first language)

5. At what age did you start learning English?
6. Can you outline your experience learning English?
7. What have you found the easiest aspect of learning English?
8. What have you found the most difficult aspect of learning English?

(For all participants)

9. If you don't know an English word you are reading, what do you usually do?
10. Do you enjoy reading? In English or another language?
11. Do you prefer to read fiction or non-fiction?
12. Do you enjoy writing? In English or another language?
13. Do you prefer to write essays or creative stories? Why?
14. How comfortable are you working with grammatical theory?
15. When and where did you learn about grammatical theory (eg. subjects and verbs etc.)
16. Are you more concerned about avoiding errors in writing or getting more ideas on paper?
17. What did you think about sentence combining exercises you did in my class?
18. Did you prefer sentence combining or traditional grammar exercises? Why?

19. Did you prefer writing open ended assignments like essays or sentence combining? Why?

20. What sort of lessons (grammar exercises, essay writing, reading analysis etc.) would you like to see emphasized in EAC 149 and EAC 150? Why?

Questions for Follow-Up Interview

21. Do you consider yourself to be a visual or auditory learner? How does this affect your method of doing sentence combining?

22. What do you do if you do not need to "think-aloud" but do not know the pronunciation of a word you are reading?

23. How often, in general, do you think about grammar when you are writing? How often do you think about style (eg. avoiding repeated words, varying sentence patterns)?

24. What do you usually do when allowed time to proofread and edit your writing assignments?

25. What do you find harder in English, sentence structure or vocabulary? Is this different when you are reading or when you are writing?

Appendix F

VAK Learning Style Inventory

1. If I have to learn how to do something, I learn best when I:
   (V) Watch someone show me how.
   (A) Hear someone tell me how.
   (K) Try to do it myself.

2. When I read, I often find that I:
   (V) Visualize what I am reading in my mind's eye.
   (A) Read out loud or hear the words inside my head.
   (K) Fidget and try to "feel" the content.

3. When asked to give directions, I:
   (V) See the actual places in my mind as I say them or prefer to draw them.
   (A) Have no difficulty in giving them verbally.
   (K) Have to point or move my body as I give them.

4. If I am unsure how to spell a word, I:
   (V) Write it in order to determine if it looks right.
   (A) Spell it out in order to determine if it sounds right.
   (K) Write it in order to determine if it feels right.

5. When I write, I:
   (V) Am concerned how neat and well spaced my letters and words appear.
   (A) Often say the letters and words to myself.
   (K) Push hard on my pen or pencil and can feel the flow of the words or letters as I form them.

6. If I had to remember a list of items, I would remember it best if I:
   (V) Wrote them down.
   (A) Said them over and over to myself.
   (K) Moved around and used my fingers to name each item.

7. I prefer teachers who:
   (V) Use the board or overhead projector while they lecture.
   (A) Talk with a lot of expression.
   (K) Use hands-on activities.

8. When try to concentrate, I have a difficult time when:
   (V) There is a lot of clutter or movement in the room.
   (A) There is a lot of noise in the room.
   (K) I have to sit still for any length of time.

9. When solving a problem, I:
   (V) Write or draw diagrams to see it.
   (A) Talk myself through it.
   (K) Use my entire body or move objects to help me think.

From Beatrice, J.A. (1993). *Learning to study through critical thinking*. New York: McGraw Hill.

Appendix G

Brock Ethics Board Approval

Senate Research Ethics Board **Extensions 3205/3035, Room C315**

DATE: July 03, 2002

FROM: David Butz, Chair
Senate Research Ethics Board (REB)

TO: Alice Schutz, Education
Elizabeth Charters

FILE: 01-295, Charters

TITLE: Thinking and Writing: An Introspective Study

The Brock University Research Ethics Board has reviewed the above research proposal.

DECISION: *Accepted as is.

(However, please make the following additions to the consent form and information letter: (a) include contact information for the Brock Office of Research Services; (b) include a statement indicating the project has been approved as Brock REB file 01-295; (c) please remind participants to keep a copy of the consent form for their records.)

This project has been approved for the period of **July 03, 2002** to **March 31, 2004,** subject to full REB ratification at the Research Ethics Board's next scheduled meeting. The approval may be extended upon request. ***The study may now proceed.***

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and approved by the REB. The Board must approve any modifications before they can be implemented. If you wish to modify your research project, please refer to www.BrockU.CA/researchservices/forms.html to complete the appropriate form ***REB-03 (2001) Request for Clearance of a Revision or Modification to an Ongoing Application.***

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

The Tri-Council. Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects, with the exception of undergraduate projects, upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form ***REB-02 (2001) Continuing Review/Final Report*** is required.

Please quote your REB file number on all future correspondence.

Deborah Van Oosten
Research Ethics Officer
Brock University http://www.brocku.ca/researchservices/
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